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THE ENGINEERING OF COAL AND COKE

COAL AGE

With which is Consolidated The Colliery Engineer

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DEVOTED TO COAL MINING AND COKE MANUFACTURE

ISSUED WEEKLY

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July 1 to December 31, 1915

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July 1 to December 31, 1915

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COAL AGE

Vol. 8 NEW YORK, JULY 3, 1915 No. 1

Coke Plants and the War

THE war in Europe has suddenly brought home to the managers of American byproduct ovens the realization that vast quantities of benzol have been wasted and are still going to waste in the coke-oven gases.

> With practically no demand for coke and hundreds of ovens idle the byproduct plants are taxed to capacity and are working overtime to fill orders.

With the price of benzol now ruling, it is quite doubtful whether the coke or the benzol should be classed as the byproduct. There is no question as to which is in greater demand; in fact, at some byproduct plants where there is practically no demand for coke the ovens are being run for the byproducts and the coke is being put in stock piles.

For several years German engineers have been trying to enthuse American coke-oven men with the possibilities of benzol recovery plants, but mostly with poor success; for this the Germans are now undoubtedly thankful, as the benzol recovered from American plants that have been built is being used mostly for manufacturing explosives destined for the Allies. Such is the uncertainty of fate.

If efficient benzol plants could be built overnight, every byproduct coke plant in the United States would have a benzol plant in operation tomorrow. However, since months instead of weeks are required, inefficient makeshift plants are springing up that will pay handsome dividends in spite of their shortcomings. Because of their inefficiency, there is little danger of the market being flooded by the output of benzol.

In their failure to discover these mushroom benzol plants, the Sunday - supplement editors have overlooked the sensation of the year, because the man who is most prominent in their development is none other than Thomas A. Edison, our most famous inventor. Think of the possibilities.

Nor is benzol the only coke-oven byproduct that is in demand just now. Even plain, sticky black tar that used to be a drug on the market and was gladly furnished to mine superintendents who would consent to use it on haulage ropes has suddenly assumed a value that has justified an attempt at cornering the market.

The effect of this unusual activity in byproducts will be noticeable when the coke-oven statistics for the year 1915 are compiled, in that it will greatly increase the proportion of byproduct coke produced for the year. The demand for coke is below normal and hundreds of beehive ovens are idle, but practically every byproduct plant is being run to capacity.

Ideas and Suggestions

Need for an Arbitration Law

By Charlton Dixon*

Now that the long strike has been ended in the "No. 8" field of Ohio a partial counting of the cost is in order. According to Coal Age the miners' union disbursed about one and a half million dollars. This large sum, however, probably amounts to only one-seventh of the aggregate which the miners, under normal conditions, would have earned during the same time at 44.6c. per ton of run-of-mine coal. The loss to the operators owing to the depreciation of their mines, to the dislocation of business and to the expense of maintenance is also serious. The coal irrecoverably lost to the state owing to the caving of rooms, the flooding of workings, etc., is immense.

Like most strikes, that in eastern Ohio had its inception in selfishness, was carried on in stubbornness without reason and terminated without honor or profit to either side.

Why Did So Simple a Solution Take So Much Time and Money?

Was there no means of discovering over 12 months ago that there was no other settlement possible than the one finally adopted? Had there been an interested third party with authority to speak and act before a cessation of operations took place—or in other words, had there been a compulsory arbitration board as in Canada—there would in my opinion have been no strike.

There was not a day in the 13½ months of strife when the operators would not have welcomed the assistance of such a board. They were always ready and willing to state the facts of their side as they did unreservedly before the investigating committee which Washington sent after a long wait.

The "No. 8" mine owners were given to understand that the settlement at the end of the biennial period would be based on the Pittsburgh district price—44.6c. for run-of-mine coal, the price paid then and now. The slack average proved that this price was fair and in all honor was the one to be adopted. Instead of the union favoring it, a demand was made for a higher figure, for which that organization was, however, unable to prove any just claim.

In the Hocking Valley the paying of 47c. for run-of-mine coal was justified because the slack average in that region made it a fair price. That figure looked good to the union and the miners of the "No. 8" field. Consequently they gave the operators in the Hocking Valley their word that if the operators in other parts of Ohio would immediately resume operation they would not permit the eastern Ohio field to operate unless it would pay 47c. for run-of-mine coal. This agreement was made to effect a break in the operators' ranks. The promise was made despite the fact it was a violation of a former undertaking.

Any such agreement was without justification and extremely dishonorable, but it was also imprudent as it cut all the ground from under the feet of the union, preventing any compromise on price. Thus came the deadlock, which again proved that honesty is the best of policies. It will take many years to compensate the monetary loss of the miners, and what of their moral obliquity? My advice to Ohio coal operators is, in future, stop, stay and start together.

The Canadian Industrial Disputes Investigation Act Shows the Way

To prevent another disastrous affair of this kind, let us hope that some legislator desirous of conserving the assets of the state from waste and its citizens from periodical spells of idleness will in the near future formulate and introduce a bill for a compulsory arbitration board. Such a body is best calculated to deal with just such cases. Every fair-minded miner and operator would give his moral support to such a bill. Whenever a party is unwilling to submit its case to investigation there is something wrong in its position.

The Canadian Industrial Disputes Investigation Act of 1907 governs all matters relating to wage allowances or other remuneration of employees, terms and conditions, etc. The Minister of Labor has general administration of the act. The board consists of three members, one being recommended by the employees and one by the employers, and these two choosing the third. Whenever any dispute exists between any employer and his employees, and the parties thereto are unable to adjust it, either of them may make application to the minister for the appointment of a board. The board must be established within 15 days.

When the creation of the board is requested, a statement is furnished telling who are the parties in the dispute, estimating approximately the number of persons affected or likely to be involved in the controversy and reciting the efforts to adjust the matter which have been made by the parties themselves up to that time. The board has the authority to make all suggestions and to do whatever it deems right to induce the parties to come to an amicable settlement.

The following clause is the important part of the act: "It shall be unlawful for any employer to declare or cause a lockout or any employee to go on strike on account of any dispute prior to or during a reference of such dispute to a board of conciliation and investigation."

A Crime to Fight First and Talk Afterwards

The penalty for a breach of this provision by the operator is not less than $100 and not more than $1000. If the employee violates it, the penalty is not less than $10 nor more than $50 for each day or part of a day that such a lockout or strike exists. The act further states that it shall be an offense for any party to incite, encourage or aid any employer in any manner to declare or continue a lockout or to induce any employee to go or to remain on strike contrary to the provisions of the act. Such an offender shall be liable to a fine of not less than $50 nor more than $1000.

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Saved Millions of Dollars

This law has prevented the loss of millions of dollars to employers and employees, not only to those engaged in coal mining, but to men in all other industries in the Dominion. Of course, even after all in reason has been done to avoid a stoppage of work, it is possible for one to take place, as happened in Vancouver under the guise of a "vacation," but neither the government nor the public was deceived by such shallow tactics and the strike ended ignominiously for the party unwilling to arbitrate.

Had the "No. 8" field been compelled to present its troubles before such a board, public opinion would have been all on the side of the operators. Why the United States Government has not long ago seen the wisdom of such an act as that established in Canada long ago is a mystery. Such a law could do no harm, and its power to effect good is incalculable. This is an important subject and a good time for Coal Age readers to debate it.

* * *

Protecting the Workmen

By H. M. Wassum*

During the past few years more and more care has been taken by nearly all the bituminous coal companies to prevent accidents in the mines and to reduce their number. No one questions the fact that all operators should make the conditions as safe as possible for the men; and I have generally found that they are anxious and willing to do this. Of course, as in everything else, there are exceptions to this rule, but it is only by the smaller companies, and such cases are soon brought to the attention of the state inspectors.

The mining laws of most states are rigid in regard to this matter, but we find that the operators, especially the larger ones, are not only obeying the laws, but are going farther and taking extra precautions whenever they think them necessary.

While we do not like to place a value in dollars and cents on human lives, we have often wondered if the coal companies are receiving full value for the large sums of money spent for this purpose. Are they spending the money in the best way possible to save the lives of the workmen? In the care and oversight of the men, I think not.

While the number of fatal accidents per million of tons of coal mined has been reduced, this reduction is not in proportion to the larger sums now being expended to this end, and we have reached or soon will reach the limit of expenditure possible for this work. Now the question is, How will we obtain better results? If we saved 100 lives last year, could we not have saved 200 with the same effort?

Most Accidents Due to Carelessness

What is the cause of the greatest number of accidents in the mines today? From the 1913 report for the bituminous region of Pennsylvania we copy the following statement: "Of the 561 lives lost inside the mines, 325, or 57.93 per cent., are attributable to neglect or carelessness on the part of the victims themselves; 11, or 1.96 per cent., to the carelessness of others; 127, or 22.64 per cent., to accidents beyond the control of the victims themselves, and in 93, or 17.47 per cent., the responsibility was not defined."

Accidents Due to Carelessness

Just think! Almost 58 per cent. of the total mine fatalities are due to the carelessness of the victims themselves. True, conditions have changed during the past ten years, but we are hardly taking this change into consideration in our methods of dealing with the question.

Ten or fifteen years ago the miners were as a rule of the English-speaking race. These men considered their work almost a profession and took pride in it. Today, with the majority of miners resident in this country less than five years, we have an entirely different class of people to deal with, and different methods are required. With the old-time miner, if the operator met him half-way in the prevention of dangers, he would do the rest, and there would be no case for the undertaker. The trouble was that the operator did not share his half of the responsibility at that time. But today the coal companies must shoulder almost the entire burden of protection or be responsible for the result.

More men have been continually placed to oversee and direct the work. This to a certain extent is necessary, for the labor is mostly unskilled. But if a man works at the same job for two or more years, and then requires the same amount of attention as when he started, there is something wrong. It is not through ignorance that the men do not protect themselves as they should nor obey the orders given them. It is as a rule their carelessness. The men are working for what they can get out of it with the least amount of labor, and they are born gamblers when it comes to taking chances with their lives.

Men Must Be Trained to Become Miners, Not Laborers

In many mines today there are so many bosses making inspections that the miner—unless something unusual happens—can not get into danger from the time of one inspection to that of another. But the unexpected frequently happens in coal mines, and if we wish to handle this matter efficiently the men must be trained to become *miners* and not *laborers*. They must be shown that they have a responsibility and that they must assume it.

Several large companies have seen the advantages of teaching and instructing the men rather than directing and overseeing them. The men are shown moving pictures in which the right and wrong ways of doing their work are flashed on the screens. Meetings are held in which the men are invited to take part in the discussions of various subjects.

The men have been made to feel that there is something in their work besides hard labor. They are made to see that they are not simply cogs in a wheel, but human beings with some responsibility placed upon them, and they can not help but become better workmen.

I believe that money spent in this way will bring us more returns in the saving of lives than in the way we have been using it. You do not need to watch a good man; he will watch himself.

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*Brier Hill, Penn.

Modern Appliances in Coke Manufacture

By E. C. Ricks*

SYNOPSIS—The beehive oven is defended on the ground that it is not now so wasteful as in former years, while the modern machines used in the process of making beehive coke have greatly reduced the cost of manufacture. Coke-oven doors are discussed at some length.

During the past few years, so much has appeared in print regarding the superiority of the byproduct and rectangular types of coke ovens that I fear many of us look upon the beehive oven as being very primitive and wasteful. Be that as it may, the fact remains that many thousands of beehive ovens are still in use, and in view of the progress made during the past year or so toward cheapening the cost of producing coke, the idea of consigning the beehive to the ash dump has been pigeonholed by the majority of coke operators.

It is not my intention to take up the merits and demerits of the different types of coke ovens in this article, owing to the limited space allotted, but simply to mention briefly the different machines and appliances used at a modern beehive-oven plant which have enabled the operators of such plants to reduce the labor cost of producing coke to a figure as low as 9c. per ton and even less. This figure represents the total labor cost from the time the coal is deposited in the ovens until the coke is loaded ready for shipment and the coke ashes hauled to the dump. No labor costs are included previous to leveling the coal, since the charging of the ovens, as well as all other costs up to this point, are practically the same regardless of the type of oven. Neither are any labor costs of upkeep included, as such costs must necessarily depend upon the condition and age of the plant, equipment, etc. I appreciate that the upkeep is a very important item, but owing to the fact that such costs at a new plant, equipped with new machinery and appliances, would be less than at an older installation, no reference to such costs will be made in this article, for fear of being misleading.

Starting with the leveling of the coal in the oven, the strictly modern plant utilizes the Covington leveling machine (Fig. 1), the only mechanical leveler for beehive ovens known. This machine, weighing approximately the same as a larry loaded with coal and geared to travel three miles per hour faster than the average larry, can level 25 ovens per hour easily, including shifting, and performs its work as well as can be done by the hand-method and much better than the average hand-leveler.

On a 200-oven per day basis, the net labor saving effected by this machine is around $10 per day, to say nothing of the additional advantage of being able to completely close and seal the oven door immediately after the coke is drawn, which is made possible by using this machine. The advantage of promptly closing the oven door, regardless of when the oven is to be recharged, is apparent in the length of time required for the new charge of coal to ignite.

This conservation of the heat is particularly appreciated when the coal bins are empty and the hoisting of coal delayed by reason of an accident in the mines or from any other cause. This leveling machine passed through the experimental stage years ago and has given satisfaction for some time, one machine having been in constant operation since June, 1909, and several others since 1912 and 1913.

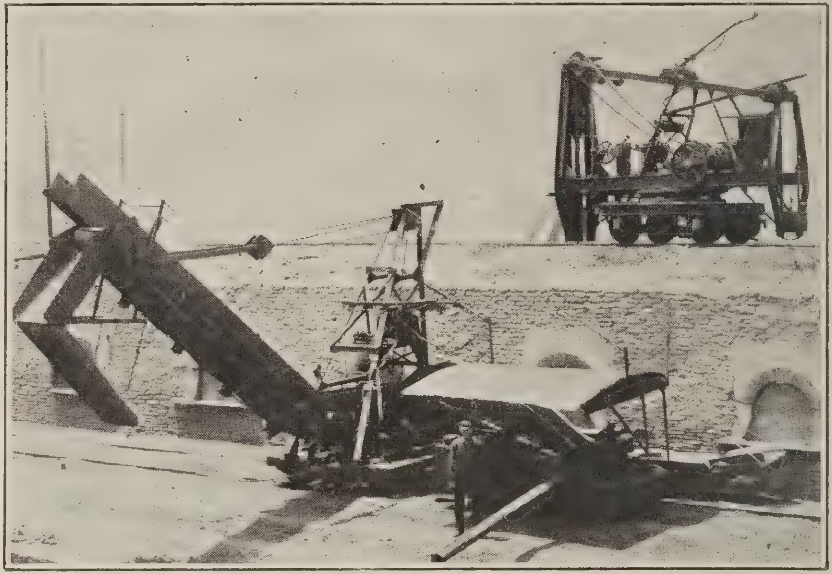

Fig. 1. Leveling Machine in Upper Right-Hand Corner and Coke Drawing and Loading Machine Below

The greatest labor-saver is the coke-drawing machine (Fig. 2), the capacity of which is from four to six ovens per hour, drawn, screened and loaded ready for shipment. So much has appeared in print regarding this machine that a detailed description of the machine and its operation is deemed superfluous. However, so many improvements have been added from time to time, including better designed parts made of better material, etc., that the efficiency of the machine has been greatly increased. The best evidence of the success of the coke machine is the number of repeat orders given the manufacturers by firms that have been using them since 1906. In addition to about six Hebb machines and about the same number of the Stauft design, there are approximately 200 of the Covington coke-drawing machines now in the various coking districts of the United States and Canada, one large coke company in the Connellsville region of Pennsylvania having 82 Covingtons.

As those who use them know, the advantages of the coke-drawing machine are many, as it not only eliminates the labor troubles experienced from time to time by prac-

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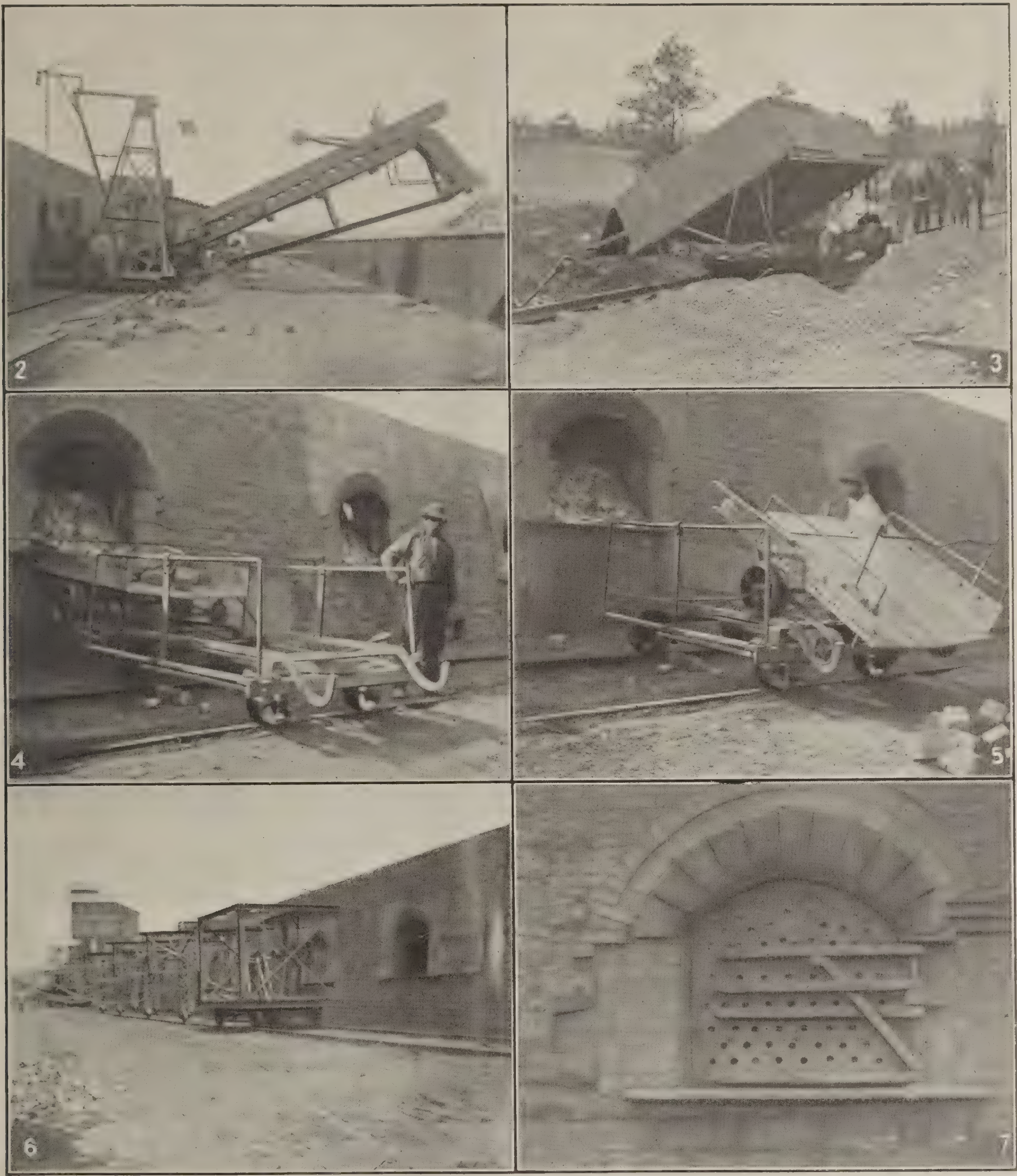
*Uniontown, Penn.



Mechanical Accessories for Beehive Ovens

Fig. 2—The first electric-driven coke machine built by the Covington Machine Co. and installed at Continental No. 1 plant of the H. C. Frick Coke Co. early in 1906. Fig. 3—An ash car which is used in place of carts for hauling ashes from the coke yard to the dump. It runs on the coke-machine track and holds 6 cu.yd., being drawn by two horses. Fig. 4—Baldwin door-brick conveying truck in use at Continental No. 1 works of the H. C. Frick Coke Co. This saves many brick from breaking by reducing the height of their fall. It will pay for itself in a few months. Fig. 5—Baldwin door-brick conveying truck with the platform in the dumping position. It has just discharged the door brick on the wharf. Fig. 6—In the center is a crane for handling unhinged oven doors, such as those of the Humphrey, McMurray, Auld and McCreary types. The crane is operated entirely by hand. This photograph was taken at the Seabright plant of the Taylor Coal & Coke Co., near Uniontown, Penn. Fig. 7—Lucia door installed at the Phillips works of the H. C. Frick Coke Co. in June, 1911. There have been no repairs whatever at this installation in four years, with the exception of two replacements of tile lining. The saving effected by using this door has averaged about 9c. per oven charge.

tically all operators of hand-drawn plants, but one machine will draw, screen and load as many ovens in a working day as any 20 men in the country can draw in the same time, and the machine will do the job for half the cost of hand-drawing. The machine will also draw easily any size charge it is possible to burn, and it might be well to add that owing to the fact that the machine draws an oven so quickly, allowing the hot oven to be recharged within 30 min. after the drawing begins, a much larger charge can be coked. In the Connellsville region, an average yield of more than five tons of coke from a 12-ft. 3-in. machine-drawn oven is common, while a 13-ft. oven yields as high as 6 tons per charge. A yield of 5 tons from any size hand-drawn oven is extremely good, 4½ to 4¾ tons being an excellent average.

In the Connellsville region, the labor cost in connection with machine leveling and machine drawing will seldom exceed 33½c. per oven, including the entire operation of leveling, watering, bricking and daubing the door and shifting cars. Adding to this the wages of a professional burner who looks after the burning of all ovens, wages of the yard boss, cost of carting ashes to the dump, forking breeze coke from ashes into railroad car, keeping railroad track clean, etc., the total labor cost still does not exceed 42c. per oven. The cost of doing this same work entirely by hand, in the Connellsville region, is seldom less than $1.25 and usually amounts to about $1.35 per oven. Figured on a tonnage basis, the saving effected by machine work is even greater, owing to the greater tonnage as previously noted.

The Improvements Pay for Themselves

As to the ultimate cost of machine work, as compared with the hand method, the net saving effected by the machines, after deducting all proper charges such as interest, depreciation, repairs, power, oil, waste, etc., has in several instances at least paid for the entire installation in from 12 to 14 months, including the labor and material cost of changing oven doors for machine work, as well as the grading of the coke yard and the laying of the machine track.

With the advent of the coke-drawing and coal-leveling machines, the Stauft rotary sprinkler also came into use. This unique contrivance, operated by the force of the water used in quenching the coke, makes it possible for one man to water three to four ovens at a time, doing the work better and cheaper than it can possibly be done in the old way and with less water.

Another improvement is the side-dumping ash car (Fig. 3) which runs on the coke-machine track. The ashes are deposited by the coke-machine conveyor at a point about 3 ft. beyond the outside rail of the coke-machine track, from which point they are shoveled directly into the ash car and hauled to the dump. This ash car holds about 6 cu.yd. and is drawn by two horses hitched tandem.

The Baldwin door-brick conveyor (Figs. 4 and 5) is another great improvement. By using this arrangement, the door brick and mud, instead of falling to the ground in front of the oven door, are deposited on this conveying truck and dumped clear of the coke-machine track. This appliance not only saves the labor cost of forking the brick away from in front of the oven door, but many brick are saved from breakage, owing to the comparatively short distance that the brick fall. The truck weighs about 1300 lb. complete and is easily moved from oven to oven by one-man power. By means of a lever the dumping of the brick from the truck is easily controlled, and this same lever is used to right the empty truck after dumping.

A Satisfactory Coke-Oven Door

Another improvement which is just emerging from the experimental stage, but which bids fair to fill a long-felt want, is a satisfactory coke-oven door. Numerous doors have been tried out in years gone by and found wanting, but the experience derived from these earlier attempts has been valuable, and from now on we may expect to see a vast number of coke-oven doors installed, not only at machine-drawn plants, but at hand plants as well. The brick firms who have reaped such a harvest in the past from the sale of door "cubes" will be called upon to furnish tile lining for doors, unless the asbestos-bound plastic clay lining invented by an enterprising Pennsylvania chemist by the name of Campbell is found preferable to the tile.

The science of coke making has reached the point where a well-burnt charge of the highest quality coke is not all that is expected. The modern coke maker insists upon uniform charging, leveling and burning, as the result of long experience, but in addition his slogan is, "Increase the yield," and in order to do this all unnecessary air must be excluded from the oven. Surplus air means surplus ashes, which spells loss; therefore this surplus air must be excluded, and the coke-oven door is expected to deliver the goods.

Among the doors recently tried out are the Humphrey, McMurray, Auld and McCreary types, all four of these being unhinged doors which, when in place, rest on the sill plate of the door opening and are prevented from falling out partly by the inclination of the top of the door toward the oven and in some cases by a pin inserted in each side of the door frame. To remove this type of door in some cases a crane (Fig. 6, center) mounted on a truck which runs on the coke-machine track is used, the crane depositing the door on a "roost" which is embedded in the oven wall alongside the door opening (Fig. 6, right). When on this "roost," the lining of the door is toward the oven wall and rests against it. Where the crane is not employed, a rail is secured to the oven wall, well above the door arch, on which rail a trolley is suspended, to the lower end of which a short lever provided with a hook is attached. To remove the door with this arrangement, a workman inserts the hook in the proper receptacle on the door, and by pulling down on the lever the door is released and the trolley conveys it clear of the door opening, after which the door either remains suspended or else is deposited on the "roost."

The only hinged door that so far has lived through the experimental stage is the Lucia, manufactured by the Covington Machine Co., of Covington, Va., which firm makes the Covington coke drawer and the Covington leveler. The Lucia door consists of two sections and is hinged in a frame, both sections being hinged on the same side. The ingenious method of hinging this door, together with the manner in which the frame is securely anchored in the oven wall, has overcome the objections to hinged doors of past experience. One of these doors (Fig. 7) was installed in June, 1911, and today appears to be as rigidly mounted and as easy to open and close as the day it was installed.

To operate this Lucia door, all that is necessary is to engage the ring attached to each section and swing it open or shut in the same manner that any other hinged door is operated. This door is made in two sections so that the top section may be left open until the coal is leveled by hand. Where the leveling machine is used exclusively, the door need only be in one section, as the coal is then leveled, not from the door, but from the trunnel head.

Of the doors mentioned the Lucia is designed for either tile or plastic lining, the Auld and McMurray for plastic lining only and the Humphrey and McCreary for tile only. The plastic-lined doors are all made with solid fronts with projecting attachments on the inside for holding the lining in place. Some of the tile-lined doors are solid also, while others are made skeleton in order to reduce the weight.

At this time it would be hard to predict which of these several types of doors will prove the greater commercial success, although the Lucia door seems to conform nearer to safety-first principles and its operation appears more simple. However, suffice it to say that the coke-oven door has come to stay, many of them having already been installed and giving good results, and I predict that before the close of the next two or three years practically every beehive oven in the United States will have been equipped with a door of some description, regardless of whether or not the ovens are drawn by machinery.

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Extracts from a Superintendent's Diary

It might be possible for a mine superintendent to direct an entire mine operation without ever leaving his office during business hours, and occasionally I have found myself attempting that very trick; but there is one thing that it is not possible to do under such a scheme of management and that is to give the feelings of the employees intelligent consideration. For several weeks now, because of a sprained back, I have been unable to travel except by means of a rolling chair, so I have been compelled to run things from the office, and I know exactly what absolute office management would mean, in my case at least.

Today when I discarded the bandages and the rolling chair and ventured forth to hobnob a little with the men, it all came to me suddenly—the realization of how completely I had lost sight of the human factor during the "brown studies" I had indulged in while confined to the office.

It so happened that on the day after I met with my accident the cost sheets of the previous month's operation were received from our auditor's office, and I immediately got busy and examined them carefully—more carefully, in fact, than I had ever done before. Nor did I stop with one examination, but got them out again and again day after day and dug into the whys and the wherefores of every item over and over again. Naturally I began to form certain conclusions and unconsciously decided upon many radical changes that I hoped would correct all of the apparent inconsistencies.

Shut up in the office with only the cold figures before me, it looked so easy and reasonable, this rearranging and consolidating of tasks to make possible the readjustment. But today with the men themselves standing before me it was an entirely different proposition.

Some of the jobs that I proposed to abolish were filled by married men having large families to support, and a few of these families had been born and reared in our camp and the fathers had been considered faithful employees always. Other changes were to affect sons who were supporting widowed mothers, whose husbands had been killed while in the discharge of their duties and in the employ of our company. And there were several newly-weds who were to suffer by the rearrangement, that had been led to believe that they might expect better positions because of their new obligations. I have never argued that it is possible for two to live comfortably on the earnings previously required by one; on the contrary, I have felt that men who annexed sweethearts should be raised to better positions at the first opportunity.

This made it clear that I should have to begin all over again, keeping in mind this time my responsibilities to the men as well as the better dividends I would like to earn for my company.

It is so easy for outsiders to suggest that corporations are not charitable organizations, nor can they be expected to give thought to the domestic affairs of their employees, and it is also easy to remark that corporations are without souls. But taking my own experience of today as typical, I'll have to take issue with the next one of my friends who makes such a statement and assure him that so long as corporations are run by average everyday citizens like myself the same average citizens can hardly be expected to act always as if they were without souls.

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Texas Has Good Coal Output

The amount of coal produced in Texas in 1914 was 2,323,773 short tons, valued at the mines at $3,922,459.

The coal production of the state is nearly evenly divided between lignite and bituminous coal, the balance being slightly in favor of the bituminous. With the exception of the production in 1913, the production in 1914 was the largest on record, according to figures compiled by C. E. Lesher, of the U. S. Geological Survey.

The total production in 1914 was less than in 1913 by 105,371 tons, or 4.34 per cent., in quantity and $366,461, or 8.54 per cent., in value. Most of the decrease in tonnage was in the lignite output, which in 1914 was 1,105,613 tons and in 1913 was 1,181,156 tons, a difference of 75,543 tons, whereas the output of bituminous coal—1,218,160 tons in 1914 and 1,247,988 tons in 1913—decreased but 29,828 tons. In value, however, the bituminous coal decreased much more than the lignite.

The coal mines of Texas were not entirely free from labor troubles in 1914, as 220 men were on strike during the year with an average of three days each of lost time.

Most of the lignite produced in Texas is mined by hand, and of the bituminous coal produced nearly one-half is shot off the solid. The use of mining machines has not made much progress in the state, and those that are employed are in the bituminous mines. The quantity of coal shot off the solid in 1914 was 612,158 tons, or 26 per cent. of the total.

Washing plants have been installed at the mines at Eagle Pass in order to improve the quality of coal sent to market. In 1914 the quantity of coal washed was 23,604 tons, which yielded 19,440 tons of cleaned coal.

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Use of Private Spur Tracks—When a railway company has constructed a spur track to serve a private coalyard, a lessee of the yard is entitled to shipping service on that track. The company's refusal to deliver shipments from persons or locations not served by its line constitutes actionable unjust discrimination. (Texas Court of Civil Appeals, Seeger vs. M., K. & T. Ry. Co., 175 Southwestern Reporter 713.)

Modern Coke-Handling Methods

By F. V. Hetzel*

SYNOPSIS—The manufacture of coke will doubtless increase in this country somewhat as it has in Germany. On account of its bulky character and the fact that breeze has a decided tendency to adhere to larger pieces, proper methods of cleaning and handling domestic coke deserve careful attention if a suitable market is to be secured and maintained.

Various technical journals and daily newspapers have referred to the present extraordinary production of by-product coke in Germany as a result of the great activity there in the manufacture of benzol and ammonium sulphate. In fact the situation is that ovens are operated chiefly for the recovery of these chemical products and the coke is produced in quantities so much greater than the normal consumption that railroads and other consumers of fuel have been directed by the government authorities to use a certain proportion of coke with their coal.

While we have not come to such a pass in this country, it is certain that the use of coke for metallurgic and domestic purposes will increase greatly within a short time and producers of it will give more attention to the preparation of their product, to the demands of the market and also to means for pushing the sale of coke where coal is now used.

In dealing with the domestic trade it is important to clean coke from the adhering breeze. Several coke producers in western Pennsylvania have built crushing and screening plants, some with overhead bins, to do this work. These were described in Coal Age of June 7, 1913, p. 876, and may be taken as representing the most advanced practice. There are, however, many places where it is not convenient to store coke in bins, especially in connection with gas works, where the daily sales of coke do not always keep pace with the production. Here the production is fixed by the output of gas that is required of the works.

In such cases large amounts of coke are often stored in the open, and means must be provided to get it from

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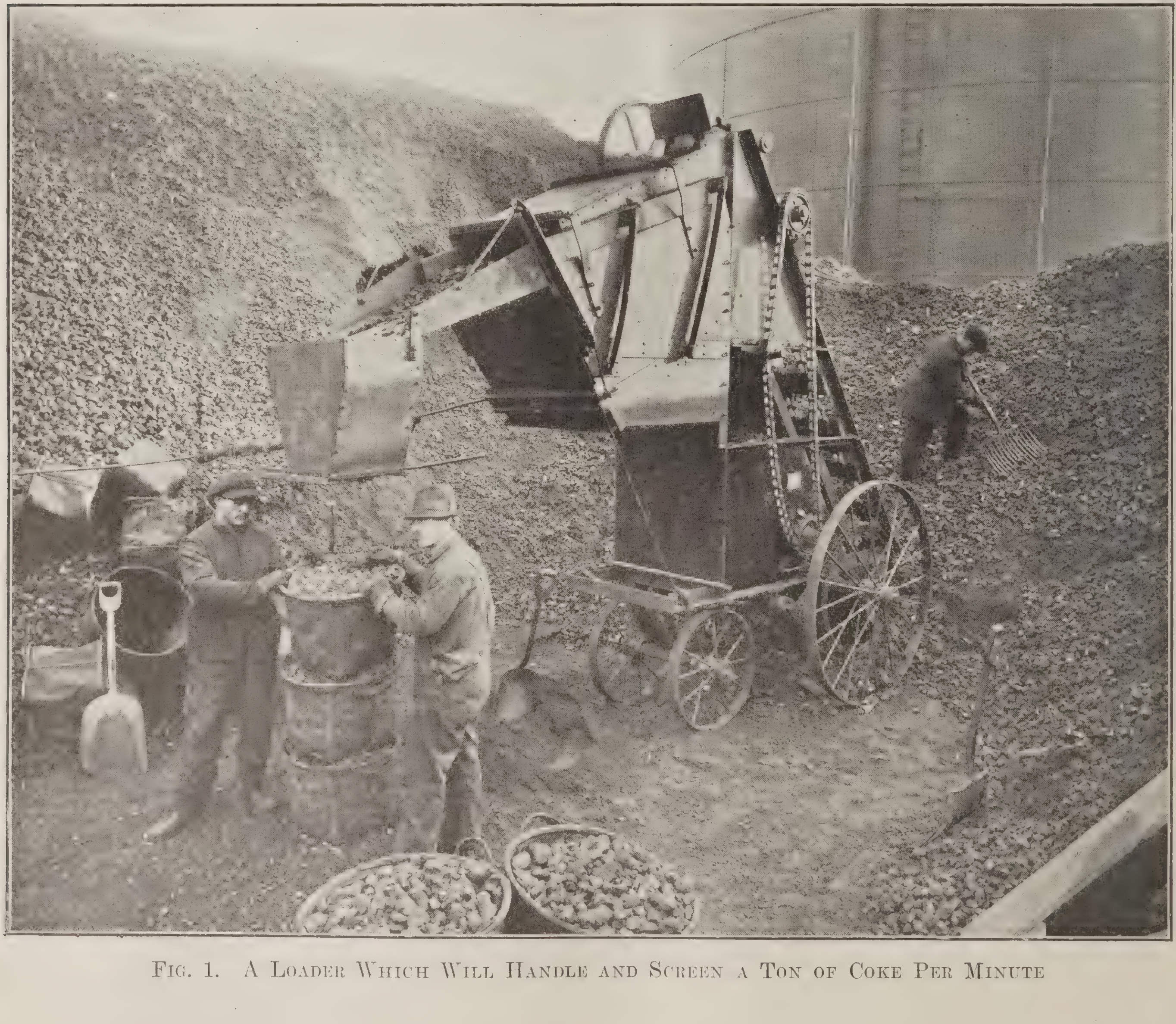


Fig. 1. A Loader Which Will Handle and Screen a Ton of Coke Per Minute

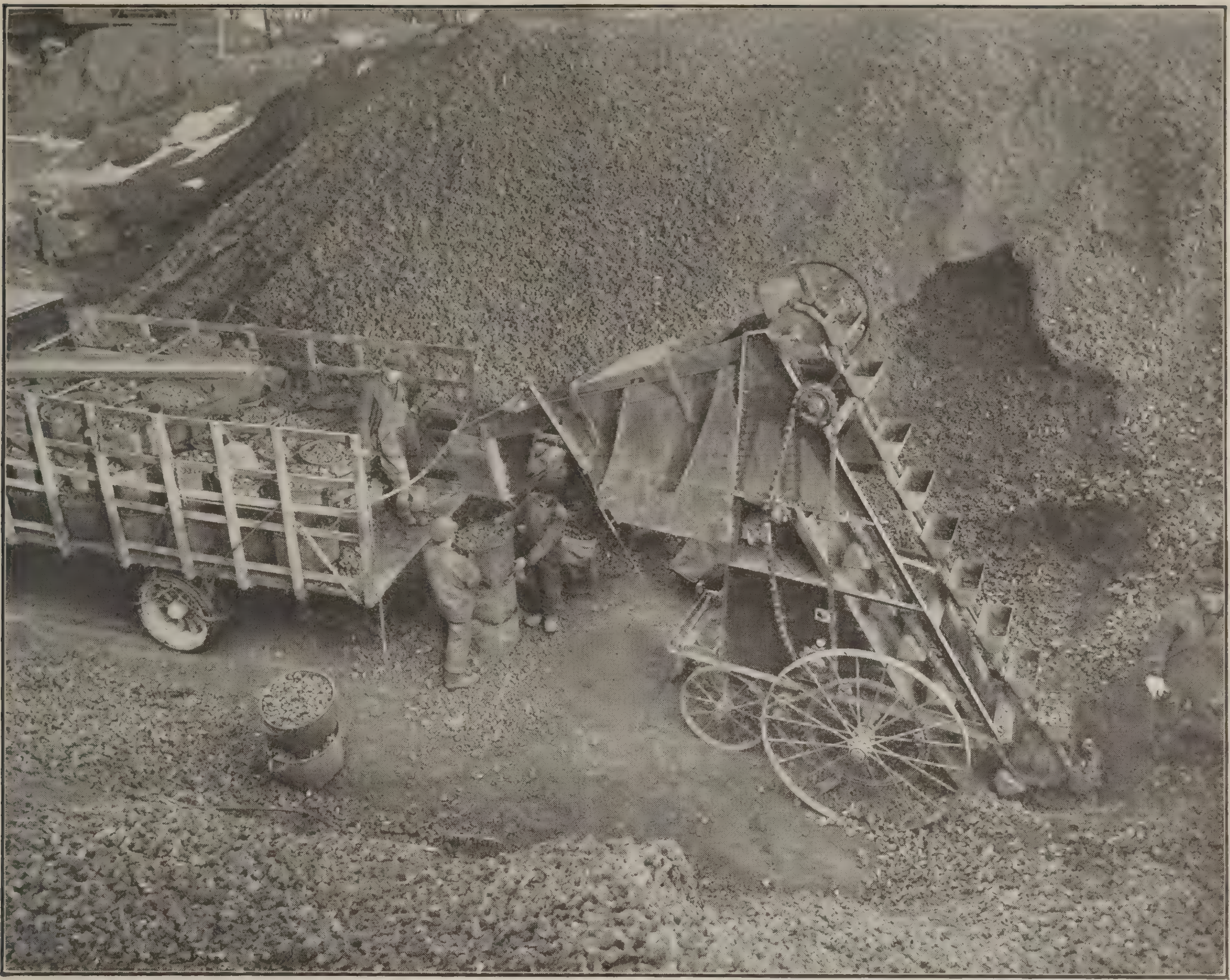


FIG. 2. A SMALLER MACHINE FITTED WITH A BAGGING HOPPER

the ground into wagons or motor trucks. Wagon-loaders are particularly useful for handling gas-house coke because they can be arranged to screen the product as it is delivered. Furthermore, with high wagons and motor trucks it is a hard job to throw coke with forks to the required height.

Another point is that a surprising amount of breeze or fines sticks to coke stored in the open. This cannot be removed by forking. In the domestic sizes the proportion of this breeze often runs as high as 10 per cent., and it needs considerable shaking to get the breeze loose.

To screen coke properly and at the same time avoid breaking it, loaders are now made with shaking screens arranged so as to receive the coke with a short fall from the buckets as they pass around the head wheel and deliver it with a short drop into the trucks. On account of the bulky nature of the product large buckets are necessary to give an ordinary capacity of a ton in one or two minutes, and to insure durability against the grit the chains are often fitted with hardened pins and bushings.

Fig. 1 shows a large loader which has a capacity of one ton a minute and which is fitted with a hopper for screenings. A 7½-hp. motor furnishes the power, and the machine is sometimes made to propel itself. Fig. 2 shows a smaller machine fitted with a bagging hopper, which holds a little more than one bagful of coke.

This machine is used in connection with a large open storage plant, and since its installation it has displaced five men who formerly did the work with forks. Furthermore it delivers coke that is really clean. It does the work more quickly, and when used for loading motor trucks it makes the latter a profitable investment by detaining them in the yard a shorter time and allowing them to be out on the street on delivery service more than formerly. In the yard shown four tons of coke are screened, bagged and loaded in 15 minutes.

On account of the light weight and great bulk of coke, a bin to hold some hundreds of tons becomes quite large and if well-built is comparatively expensive. Storing in the open or under sheds is much cheaper, but the expense of reclaiming and reloading the coke from the ground by forking and screening has in the past been the great objection to such methods.

With the use of the screening loader most of this expense is avoided and the coke can be loaded more quickly and screened much better. As a consequence the cheaper plan of storing coke on the ground has been adopted by a number of coke plants in preference to building bins for storing it overhead.

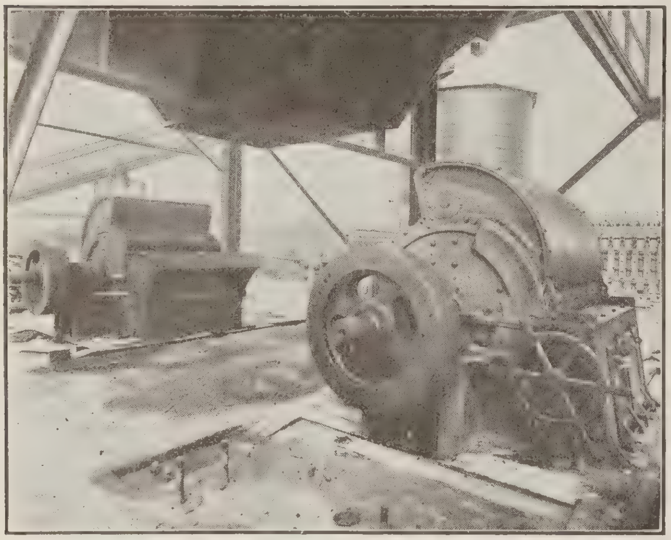
Crushers for Byproduct Ovens

M. J. Williams*

SYNOPSIS—A description of two of the largest machines ever built to crush coking coal through a $\frac{1}{8}$-in. mesh screen. These crushers weigh about 15 tons each and have an hourly capacity of 250 to 300 tons.

The accompanying illustration shows two No. 8 Williams patent jumbo coal crushers installed in the byproduct coke plant of the Minnesota Steel Co., at New Duluth, Minn.

These crushers are intended to pulverize bituminous coal for byproduct coke ovens. The coal is delivered to the storage bin above the crushers in $1\frac{1}{2}$-in. cubes and finer, being broken to this size by Heyl & Patterson Bradford breakers. From the storage bin it passes by gravity to the two crushers, where it is pulverized and ground to a product 90 per cent. of which will pass a $\frac{1}{8}$-in. mesh screen.



Jumbo Crushers for Coal and Coke

These two machines are mechanically interesting for a number of reasons:

1. They are the largest size crushers ever built for reducing coal to $\frac{1}{8}$ in. and finer. They will each be direct connected to motors of approximately 350 hp., operating at a speed of 750 r.p.m. The flexible couplings used to make this connection are of the Baehr type, capable of transmitting from 500 to 600 hp. The use of flexible coupling relieves the motor of any shock or stress caused by intermittent loads. It also does away entirely with belts, makes the installation compact and is the most efficient drive possible for crushers of this character.

2. Each crusher is equipped with a metal trap or arrester, so arranged that a large percentage of stray or tramp iron which may pass the magnets located between the storage bin and the crusher is trapped and can be removed at any time without injury to the internal parts of the crusher. These metal arresters are in successful operation on many crushers of this type and never fail to do the work. They are practically fool-proof.

3. Each crusher is equipped with an $8\frac{15}{16}$-in. shaft, which runs in self-oiling dynamo bearings. These are dust-proof, self-lubricating and remain clean and cool at all times.

4. Each crusher is equipped with cast-steel disks carrying the hammers, with a series of six adjusting holes. These permit the operator to "let out" these hammers as they become worn, $\frac{1}{2}$ in. at a time until 3 in. is worn off the hammer end. This amount of wear ends the usefulness of the hammer. With this adjustment all the available stock in a crushing hammer may be used.

5. Each crusher is equipped with an adjustable breaker-plate and front end. The operator may adjust this plate in toward the revolving hammer from $\frac{1}{32}$ in. up to 2 in., or any distance desired between these limits. Such an adjustment may be made while the machine is in operation.

6. Each crusher is fitted with a Williams adjustable dumping cage, which may be adjusted up toward the hammer any distance desired to compensate for wear, while the entire cage may be dropped or dumped into the discharge chute under the machine at any time. Dropping this cage relieves the crusher from uncrushed coal in the event of a fuse blowing. The failure of a fuse would stop the crusher, and unless the feed to it is cut off simultaneously with the stoppage (which can never be done), the machine will load up with uncrushed coal and cannot be started again until this is removed.

To clean out a crusher under ordinary conditions requires opening the machine and working the coal out by hand. This takes from one to three hours, depending upon the men and the conditions under which they are working. With the Williams dumping cage, however, when such a choke-up occurs, the operator merely releases a pawl engaging a ratchet wheel which is placed outside the crusher, and the entire cage by its own weight drops and discharges all the uncrushed coal through a bypass chute. The turning of a handwheel then raises the cage to its proper position, and the machine is again ready for operation.

The dumping cage is fitted into a cast-steel sub-frame, hinged or pivoted at the front of the crusher. The rear end of this frame is fitted with special steel chains which engage sprockets on a countershaft, the actuating mechanism of which is spur gears and a substantial pilot wheel on the outside of the crusher. The ratio of the gears is such that one man may easily raise the cage to its normal position. The operation of discharging the contents of the crusher, as described, and of bringing the cage back to its proper place is the work of from two to three minutes for an experienced operator. This operation may be made necessary, not only by the blowing of a fuse, but may result from any other stoppage cause.

7. Each crusher is built up in sectional construction, and although each machine weighs 15 to 16 tons, any part may be replaced at any time without disturbing the rest of the crusher, the heaviest individual part not weighing over 1500 lb. It is readily apparent, therefore,

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*Williams Patent Crusher & Pulverizer Co., Old Colony Building, Chicago, Ill.

that replacements are easy and that the cost of any individual part is comparatively small.

The general construction of these crushers presents some interesting features, such as large doors at the back and front of the machine by which from two to three men may freely enter the chute under the crusher and not be crowded. The hopper opening into each crusher is 2x5 ft. Each machine will easily handlle from 250 to 300 tons of coal per hour, crushing it to a product 90 per cent. of which will go through a ⅛-in. mesh screen.

These crushers are approximately 13 ft. long over all, 11 ft. wide and 6 ft. high. They are set upon steel I-beams embedded in a large concrete foundation at an elevation of approximately 15 ft. from the track or ground level.

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Improving the Beehive Output

By H. S. Geismer*

SYNOPSIS—Byproduct ovens possess many advantages over those of the beehive type. To offset these advantages and to produce a product that can compete in the market with byproduct coke great care and attention to minute details are necessary in the manipulation of the beehive oven.

There are in the United States today a large number of idle batteries of beehive coke ovens, and some of the owners are beginning to wonder if they will ever be able to put them in blast again. In some instances their worst fears are well-founded. Because of the present high prices on all coke-oven byproducts there are practically no idle by-product ovens in the country, and in consequence the sale of byproduct coke is being pushed, and a goodly number of foundries and furnaces are using this fuel almost exclusively, or at any rate in larger proportion than ever before.

Whether they will ever go back to beehive coke (assuming of course that they can always obtain a sufficient supply of the byproduct variety) will depend on the results they obtain with the byproduct coke now being furnished. If their former coke supply was obtained from a beehive-oven operation that produced a coke of variable quality—and there have been only too many such operations in the past—it stands to reason that they have learned now what uniform quality in one's coke supply really means, and they will go back to beehive coke under protest, since any byproduct plant furnished with a uniform quality of coal can be depended upon to produce an equally uniform quality of coke. If, however, the results obtained from the two varieties of fuel show little variation, the question of returning to beehive coke will depend largely upon the future selling price of the two grades.

Some half-dozen years ago in taking charge of a group of mines and furnaces I found myself called upon to decide between the possibility of improving the quality and cutting the cost of the beehive coke produced at one of the operations or abandoning that operation. The investigation that resulted was similar to the inquiries that will have to be carried on at many existing beehive-oven plants if they are to successfully compete with byproduct ovens now reaching out for business in their territory. A short account, therefore, of what was accomplished and how it was accomplished may prove of interest.

No originality is claimed for the method used nor for that matter is any great originality required with most efficiency tests. It is largely a question of arousing the interest of the management to a point where it will pry into the details.

Cost Sheets were first Studied

First, a careful study of the cost sheets of the previous management was made, from which it at once became evident that the high cost of coke was due principally to the low yield from the ovens, 50 per cent. being the average. Careful analyses of the coal used threw no light on this low yield.

Next, inquiry was made at the furnace where the coke had been consumed to find out if possible why this fuel had been given such a bad name. The result of this inquiry showed that the ash content of the coke, as delivered at the furnace, was exceedingly variable, and as a result the furnace worked irregularly when burdened entirely with it. Careful analyses of the ash derived from the coke showed that it ran high in alumina, and this probably aggravated the irregular working of the furnace, when the percentage of ash in the coke was excessive or above what would be expected from average coke of high variable ash content.

This variable ash content indicated a lack of proper supervision in operating the ovens or in the preparation of the coal or a combination of both. Thus all of the evidence obtainable from the records indicated that mismanagement at the ovens might be responsible for the poor showing that had been made by the operation.

The investigation was now carried direct to the ovens, and close inspection was made of every step in the operation from the time the coal was loaded into larries for the ovens until the finished coke was forked into railroad cars. It became evident at once that a number of circumstances contributed to the low yield of coke.

The coal used was washed before being sent to the ovens, and as the bin capacity at the washer was small it often happened that the coal was taken from the bins before the water had time to drain out. When this happened the larries might contain as much water as coal, and the oven bottoms were consequently flooded and chilled. As a result these ovens were slow to flame and they did not burn in on time.

If the coke puller who was in charge of the particular oven that had failed to burn in on time got impatient, he might punch a few holes in the oven door to hasten its burning in. This necessarily meant that a considerable quantity of coke would be burned up in the oven before being pulled. Not satisfied with this, the puller would often pull the oven before coking was complete, occasioning further loss as well as a poor quality of coke.

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*Keiser-Geismer Engineering Co., Birmingham, Ala.

Labor was scarce, and if a puller was reprimanded too severely for pulling an oven before it was burned in, he might walk off without pulling the oven, and the chances were that it might have to stand anywhere from three to six hours before it could be pulled.

THE WEIGHT OF COAL CHARGED VARIED

Another direct result of the variable water content of the washed coal was a considerable variation in the actual weight of coal in each of the larry charges. This meant that the ovens could not be depended upon to deliver the same quantity of coke from each charge nor could they be depended upon to burn in at regular intervals.

Again it was found that the man in charge of the larry stood in with some of the coke pullers and would put small charges in their ovens, thus relieving them of some of their labor without reducing their earnings, as they were paid by the oven and not on a tonnage basis. Ovens with these light charges often burned in before the pullers reported for work, and if not properly drafted they burned up part of their charge.

It took several weeks of close supervision to inaugurate a system which insured uniform oven charges and a fixed coking time for each charge, but when these were obtained the output per oven per day became a dependable quantity.

Only one condition that contributed to the low oven yield was beyond the control of the coke-oven management—the coal as delivered to the oven contained a considerable quantity of "mother coal." It was found that this "mother coal" produced a coke that was very friable, and a good deal of it was broken up into breeze while being handled on the yard. Because the blast-furnace management regularly raised a howl about the importance of screening out more of the fine stuff, which howl was often well-justified, the coke loaders were cautioned to fork the coke carefully on the yard. In doing this, they broke up a considerable quantity of the friable coke, and this also had its effect on keeping down the yield from the ovens. This trouble was later largely overcome by adopting strict dockage rules at the mines governing the loading of "mother coal."

WHAT WOULD BE THE RESULT OF CAREFUL MANIPULATION

A test was next decided upon to prove just what the ovens could be expected to do if properly handled. Ten ovens were chosen, and for a ten-day period they were given close personal supervision. Each larry was carefully inspected before being discharged to see that it had the exact amount of coal and also that the moisture content was not excessive. The drafting as well as the time of charging and drawing was given the closest attention, and each charge of coke before being loaded into railroad cars was carefully weighed.

It was found that these ovens gave a uniform yield of 59½ per cent. of good quality coke, after screening out all the fines that any reasonable blast-furnace manager could class as breeze.

Profiting by the experience gained with the test ovens, rigid rules were adopted for the entire battery, and the results were most astonishing. The yield of coke from the ovens, taking railroad weights as the basis, jumped up to 57½ per cent. The ash content of the coke was also reduced considerably and remained fairly uniform.

The net result was that the cost of the coke was brought down to where it could be put on a competitive basis with the most favored ovens in the district, and the quality became such that it could be used in blast furnaces without the uncertain result that had previously so often upset the management. Not only that, but the total quantity of coke produced by the ovens began to increase considerably, and after reaching the maximum remained practically uniform while previously it had varied greatly.

The most gratifying feature, however, to all who took part in the test was that all of the improvement had been brought about without making any changes in the ovens or in the oven equipment. Neither were any material changes made in the working force.

The total cost of coke at any beehive-oven operation is dependent upon so many apparently insignificant details that it is difficult to make the man in charge of the mines realize the importance of carefully digging into all of them. Nevertheless it is only at plants where all of the details are carefully inquired into that satisfactory cost sheets can be found. And furthermore, strange though it may seem, in most cases the best quality of coke is secured when the coke-oven cost is reduced to a minimum.

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Coke-Oven Accidents

The United States Bureau of Mines will soon issue its first report detailing the coke-oven accidents in the United States during 1913 and 1914, as compiled by Albert H. Fay, mining engineer. The investigation includes the returns from 275 active plants in 1913 and 253 in 1914 and shows that 96 men were killed, 644 seriously injured and 4059 slightly injured. These plants employed 24,345 men in 1913 and 22,313 men in 1914. The death rate for each 1000 employed was 1.89 in 1913 and 2.02 in 1914.

Mr. Fay says: "The number of coke establishments in 1913 was 551, with a total of 102,650 ovens. The bureau's report embraces 82 per cent. of the ovens. A number of the plants operated only a portion of their ovens, so that the total number idle includes more ovens than are represented by only the idle plants. While the accident figures collected are not complete for the entire industry, yet they are sufficiently representative to point out some of the hazards of this class of work. No distinction has been made concerning the type of ovens in use.

"The figures show that 37 per cent. of the fatalities resulted from accidents caused by cars, larries and motors; 11 per cent. was due to coke-drawing machines, and a like percentage to electricity and falls of persons. Of the fatal injuries 21.5 per cent. was due to haulage systems and 24.1 per cent. to falls of persons. Of the slight injuries 8.3 per cent. was due to haulage systems, 12.2 per cent. to falls of persons, 14.6 per cent. to hand tools and 14.9 per cent. to burns.

"Since 37 per cent. of the fatalities at coke ovens is due to haulage systems, greater care and precaution should be taken to safeguard employees who operate or work near transportation equipment. Inasmuch as electric haulage is used extensively, a large percentage of the electrical accidents may also be classified with those resulting from haulage systems, or over 40 per cent. of all the fatalities. It is in this department of the coke industry that there appears to be an excellent field for the reduction of accidents.

Coke as a Domestic Fuel

SYNOPSIS—It is pointed out that the markets for coke could be greatly enlarged if the manufacturers of this product would conduct an intelligent educational campaign. Coke is the logical competitor of anthracite since it possesses many of the advantages of the latter fuel.

While coke is used as a domestic fuel, it is only to a very limited extent. The object of this article is to impress upon the manufacturer of coke the golden opportunity that awaits his product as a real competitor in the domestic anthracite market.

Coke has all the advantages of anthracite, and in addition several that the latter does not possess—greater cleanliness, uniformity of quality and, lastly, cheapness when price and results are considered.

Years ago coke as a domestic fuel was condemned on the score that it burned the grates. Of course it did, for the only coke known to commerce at that time was the hard, silvery 72-hr. coke. This is the coke that has driven anthracite from its position of being the chief means of smelting ores, until now practically no anthracite is used for that purpose. Furnace coke was only intended for this one purpose, that of creating intense heat, and when tried as a domestic fuel it isn't any wonder that it ruined stoves.

Times have changed and the fuel business also, and now with the introduction of the byproduct coke oven we are getting a fairly satisfactory coke for domestic use, but even now the market for such coke has been merely touched. Much of the original prejudice against coke still persists and must be swept away before any real progress can be made. Fortunately there is a way for those with an open mind.

Coke the Poor Man's Fuel

At this time coke occupies the position of the poor man's fuel—the fuel for him who can spend but 5 or 10c. at a time. Yet while it is the poor man's fuel, the user nevertheless is getting more for his money and is at the same time enjoying a luxury somewhat akin to that of our colored brethren who for years were the chief consumers of bacon, until their white brothers awakened and by improved methods of preparation and exploitation on the part of the big packing companies, boosted the price 10 to 15 times what it was formerly.

While no one can expect such an increased price in coke, the only desire being to find a wider market, yet a lesson can be taken from the bacon story in encouraging coke manufacturers to give the needed attention in the way of adapting coke preparation to meet all conditions, together with a proper exploitation of its virtues as a fuel.

Being entirely a manufactured product the preparation of coke is in the hands of the maker and should not be the result of chance. In a way the use of coke for a domestic fuel was almost as much an accident as was the first use of anthracite. The first acquaintance the public had with it as a domestic fuel was brought about by the gas companies about 40 years ago. In making their gas they produced as a byproduct a 4-hr. coke and this was sold cheaply to a limited trade at a very low price to get rid of it. Yet even this coke fully met all the requirements of an ideal domestic fuel.

Coke vs. Anthracite

To those in the Eastern States who have had an opportunity to compare the two fuels, coke and anthracite, in actual burning tests in ordinary domestic use, there is not the least doubt that coke not only does as much but more than anthracite. However, only a comparatively few realize this, and it is up to the manufacturer of coke to create his market, along lines similar in a way to those by which the manufacturers of gas created one for their product, which developed from a mere illuminant until now it is an active and extensive competitor of all domestic fuels.

For years the anthracite producers have been allowing the gas companies to take their market from them—not that the anthracite tonnage has not increased, for it has, but not in proportion to the growth of population. As the result of this lack of real activity on the part of the anthracite interests the hard-coal trade has been put on its back helpless for four months of every year.

There is not a bit of doubt that much of this trade could have been held by the coal companies had they made any effort at all. As an illustration of the loss of trade it is interesting here to mention the experience in one town. The community in question is 70 miles from the anthracite region and of the 5000 homes there contained, over 1000 did not even have a gas range in them. This is not an isolated instance, for similar conditions may be found in any important community. In the community referred to, besides losing the summer tonnage, the winter demand for anthracite has gone as well, and 90 per cent of it was lost because no effort was made to keep it. The remarkable thing is that all this has taken place despite the fact that gas never was nor ever will be as cheap as coal. The gas companies are simply making the most of their opportunities by dwelling on the favorable aspects of their product and continuously hammering away.

This case is only recited here to prove to the coke manufacturer that, with all the favorable qualities possessed by his product, there must surely be a wide market for it, but it is going to take more than merely saying coke is better than anthracite—he must prove it to the people he wishes to reach; and here in small compass is one man's idea as to how a start can be made.

How to Popularize Coke

Know your product. Being a manufactured substance its quality so far as uniformity is concerned is within your control. It is also absolutely necessary to know what your fuel can do under all conditions. For instance, does a 4-hr. coke meet all the requirements of an ordinary heating stove? Is a different kind required for the cook stove? What size acts best in each? How about the results in steam-heating plants? Will the same kind and size of coke as used in ordinary stoves do for steam, hot-air, or vapor heating plants? It is not at all likely that it will, but it is your business to know. You should know exactly what your fuel will do, and after all of these factors are determined you are prepared to go intelligently after your market.

In seeking an outlet select the most progressive dealer you can find in a town. It goes without argument, of course, that you must make your proposition attractive to him, but you will find he will meet you more than half way if he finds you are responsible and in earnest. Then have your people thoroughly instruct him as to the method of firing the different stoves and heating systems so he can educate his customers. Better still, establish an exhibition plant on a main thoroughfare, with various stoves in operation and show the public the advantages of coke by actual demonstration, which, together with judicious advertising, will prove to them what they are missing in not using the best fuel obtainable.

Of course you will say this is an expensive proceeding. Without a doubt it is. So was the process of the gas companies in educating the public to their way of thinking. Every one knows how the gas companies simply lingered along for years until a man with a new idea came forth.

To a much lesser degree the coke industry as a factor in the domestic market must blaze its path. Then only will it get a full measure of the domestic trade that inherently belongs to it.

That it pays to spend money to make money has had no better demonstration than the experience of the selfsame gas companies as proven by their earnings today. As much or more in proportion can be done for the coke industry if the producing interests really want a share of the domestic coal trade of the East, which amounts to about 70,000,000 tons yearly. It rests entirely with them and the proportion they get will be determined largely by the fact of how much they want the business.

Need of Competent Chemists

With the establishment and rapid growth of the byproduct coking industry in the United States, there comes the necessity of having competent men to carry on researches into the problems associated with the carbonization of coal.

Participants in this particular branch of industry will sooner or later be confronted by economic problems in the production and quality of their output which will require solution through efficient chemical and physical research at the hands of technically trained men. In other words, conditions will soon require more than the ordinary plant routine tests now mostly carried on by laboratory boys and men, some of whom have little if any chemical training.

The raw coal must be thoroughly investigated so as to determine which particular grade or mixture gives the greatest yield of byproducts. The process of carbonization itself must be intelligently studied from a scientific standpoint, getting away from the rule-of-thumb methods of dumping the coal into the ovens and trusting to luck for results. The treatment of the byproducts requires scientific skill so as to bring out the greatest yield of ammonia, tar, gas, etc., per net ton of coal. To improve the regulation and mechanical parts of the processes is also within the sphere of the chemist.

A Field for Study

The abstraction of benzol and its derivatives from the coke-oven gases will also afford a field for much study in the future, and if this country is to compete with others along these lines money must be appropriated and spent in scientific study and investigation for the advancement of this industry. American carbonizers have been slow to grasp this idea of chemical research, while the few that have lent an ear to it have not had the patience to wait for manufacturing improvements and results. The problem of a chemical process cannot always be solved in six months; it may take years. Accordingly the manufacturer is somewhat reluctant to spend money for something that does not yield an immediate return.

To properly promote the advancement of this great industry, as yet in its infancy so far as America is concerned, but which no doubt will be ultimately highly remunerative, there must be employed technically trained men, at a compensation commensurate with ability, to value the raw materials, produce high-grade products, suggest the utilization of the various substances and control the processes, also to carry on preliminary experimental work on byproducts which are now going to waste and which will eventually be recovered at a profit.

Ballads of a Coal Miner--II

By Berton Braley

Here I am now with my lamp an' my pick
Ready an' willin' to start on my trick,
Primed for the kind of a job I must do—
One of the underground crew.

Ready to ride on the rackety cage
Down to the room where I'll sweat for my wage,
Dusty and grimy an' sooty to view—
One of the underground crew.

Down in the depths in the blackness and murk
Down where the dust an' the gases may lurk,
Down where the chances is—well, not so few—
One of the underground crew.

Folks must be warm an' the engines must turn,
There must be coal for the boilers to burn;
I've got to labor to bring it to view—
One of the underground crew.

Somebody's got to be sweatin' down there, far from the sun an' the pleasant fresh air,
Somebody's got to—an' so it's my cue—one of the underground crew.

Problems in Successful Coking

By F. S. Johnson*

SYNOPSIS—A short résumé of the coking industry in the United States, together with instances showing that in order to secure good coke it is sometimes necessary to pay careful attention to methods of mining. Carelessness underground often results in inferior coke.

The early history of the coke industry is somewhat vague, and various authorities disagree as to the date of its beginning. According to Fulton, coke is known to have been used successfully in Shropshire, England, as early as 1735, but was not employed extensively as a blast furnace fuel until 1750.

The first positive knowledge we have of its use in America was in 1817, or about 30 years after the close of the Revolution, when the expansion of the iron industry had made it necessary to seek a cheaper fuel than charcoal, which up to this time had been used exclusively for blast-furnace operation.

Practically all that is known of the manufacture of coke in the United States between the years 1817 and 1825 is a mention of the fact that coke was "made on the ground."

In 1825 a representative for the Society for the Promotion of Internal Improvement in Pennsylvania, who had been sent to England to ascertain the most improved methods of iron manufacture there, submitted a report giving detailed drawings of ovens in use for the manufacture of coke.

This report no doubt resulted in much experimenting, but not until 1841 do we have any authoritative knowledge of the use of coke ovens. This is obtained from the report of J. D. Weeks on the manufacture of coke in the United States in the census year of 1880, in the form of the following incident, the relator being a Mr. Provance McCormack:

> James Campbell and myself heard in some way that I do not recollect that the manufacture of coke might be made a good business. John Taylor, a stonemason, who owned the farm on which the Fayette Coke Works now stands and who was mining coal in a small way was spoken to regarding our enterprise and proposed a partnership—he to build the ovens and make the coke and Mr. Campbell and myself to build a boat and take the coke to Cincinnati, where we heard there was a good demand. This was in the year 1841. Mr. Taylor built two ovens. I think they were about 10 ft. in diameter. My recollection is that the charge was 80 bu. The ovens were built in the same style as the ones now used, but had no iron ring at the top to prevent the brickwork from falling in when filling the oven with coal, nor had we any iron frame at the mouth where the coke was drawn. The top and mouth had to be repaired when they fell in. In the spring of 1842, enough coke had been made to fill two boats—about 800 bu. each—and we took them to Cincinnati down the Youghiogheny, Monongahela and Ohio, but when we got there we could not sell. Mr. Campbell, who went with the boats, laid at the landing some two or three weeks, retailing out one boatload and part of the other in small lots at about 8c. a bu.
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> Miles Greenwood, a foundryman of that city, offered to take the balance if he would take a small patent flour mill at $125 in payment, which Mr. Campbell did. He had it shipped here. We tried it, but it was no good, and we sold it to a man in the mountains for $30. This ended our coke business.

Although this attempt at coking coal in ovens proved rather discouraging, a slow growth continued as is evidenced by the fact that in 1859 the Fayette Coke Works constructed a battery of 30 ovens.

Coke Making Has Kept Pace With Steel Making

It would be interesting to trace the growth of the industry from the coke "made on the ground" requiring from 5 to 10 days for complete carbonization, depending on weather conditions, with a 50 per cent. yield, to the last word in byproduct ovens, where the time of coking and the yield are almost optional. But to do this would necessitate a like treatment of the iron and steel industry, upon whose growth the coke industry is almost entirely dependent. However, when we consider that at the end of 1913 there were 575 coke-making establishments in this country, distributed in 24 states, with over 100,000 beehive and over 5000 byproduct ovens, we can appreciate the great progress made in the 50 years following the building of the first 30 ovens in Pennsylvania.

While this phenomenal growth is something of which to be justly proud, there is yet much to be desired in the coke industry of this country. The same figures showing this wonderful expansion also reveal the ratio of beehive to byproduct ovens to be 20 to 1 and mark us as the most extravagant of peoples in the exploitation of our natural resources.

At a byproduct plant in Great Britain recently, experiment showed that from every ton of coal charged there was obtained from 12 to 15 cwt. of excellent coke, which sold in the market for $7.50 per ton; also 30 lb. of ammonia, which sells for $63 per ton, 100 lb. of tar at $8.50 a ton 2½ gal. of benzol worth 60 cents and 5000 cu.ft. of gas. All of this would have been wasted had beehive ovens been used, with the exception of the coke, and in that case the yield would probably have been much less.

To show more accurately our extravagance and wastefulness from this source we may take the statistics compiled by the Bureau of Mines for the year 1913, in which our own market conditions, etc., are taken into consideration.

Of approximately 570,000,000 tons of coal mined in that year, 75,000,000 tons, or 13 per cent., was used for making coke and gas. Had all of this coal been coked in byproduct ovens, the higher yield of coke would have increased its value $10,000,000, while $80,000,000 worth of byproducts would have been recovered. In other words, there was wasted in the coke industry of the United States in one year $90,000,000.

Byproduct Ovens Give an Increased Yield

While this condition of affairs is usually condoned by the great difference in the initial cost of the ovens and the sometimes inferior quality of the coke produced in the byproduct process, these facts are not sufficient to justify the present procedure, as the following results given by various investigators will prove.

In beehive ovens, Pocahontas coal containing 18 per cent. of volatile matter gives a yield of 62 per cent. of coke. In Semet-Solvay ovens, the same coal yields 85 per cent. of coke. Connellsville coal containing 32 per cent. volatile matter yields in beehive ovens 64 per cent. of coke and in Semet-Solvay ovens 72 per cent. of coke. Considering the comparative cost of the two types of ovens on these figures alone, the surprising cheapness of the byproduct oven is shown. The chief objection formerly raised to byproduct coke was its dark color, produced by watering outside of the oven. This of course was nothing more than a prejudice on the part of the foundrymen, which is rapidly being dissipated, as is evidenced by the large corporations that are increasing their byproduct plants and using more and more of this fuel each year.

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*Coalton, W. Va.

While considerably more skill is required for the successful operation of byproduct ovens than for those of the beehive type, there are certain fundamental precautions to be observed in mining and preparing a coal for coking which are equally essential to both types.

Physical Structure Is Improved by Coal Crushing

Every experienced coke maker knows the benefit derived in the physical structure of the coke from a fine crushing of the coal, making a lighter, more uniform and stronger product. While this advantage is generally recognized, it does not by any means solve the question from a chemical standpoint, and additional methods of treatment are frequently required, varying with the composition of the coal and the condition in which the impurities occur.

It is not the intention of this paper to go into the merits of the various coal-cleaning equipments upon the market today. On the other hand, it is well worth while to mention one or two things which frequently escape the notice of the average coke operator and which sometimes play havoc with the quality of his product.

At most coke plants where the ovens are located at the mines, it is the general practice to screen the coal, using the slack in the ovens and shipping the larger grades. Market conditions sometimes render this plan impossible, and in order to keep the ovens in operation it becomes necessary to crush the entire output of the mine.

Such a contingency recently arose at a plant that had been producing a coke uniformly low in ash and sulphur. Almost immediately complaints which were unknown previously began to pour in. Several analyses of the crushed run-of-mine coal showed an ash and sulphur content of 12.15 and 1.78 per cent. respectively, producing a coke averaging 17.81 per cent. of ash and 1.41 per cent. of sulphur, while an average of an equal number of the slack samples had previously shown 8.8 per cent. ash and 1.28 per cent. sulphur, producing a coke of 13 per cent. ash and 0.96 per cent. sulphur.

Cause of the Trouble

Investigations concerning the method and time of burning proved that everything was normal in these respects, so that inquiries were directed to the inside of the mine, where it was soon discovered that because of the slate and sulphur partings being confined to the upper portion of the breast coal little breakage occurred during mining and the impurities remained in the larger grades, being removed by the trimmers in passing over the screens. Consequently these impurities had not affected the coke while the slack alone was being used, but caused trouble when the run of mine was crushed for coking.

The difficulty in this case was surmounted by confining the work to that portion of the mine containing the cleanest coal—a bad practice from a mining point of view; but it saved the day for the coke and fortunately did not have to be continued long enough to injure the future development of the mine.

At another plant the ash in the coke took a sudden rise while the same grade of coal (slack) was being used as usual. Several samples showed an analysis of 15 per cent. ash with a correspondingly ruinous ash content in the coke. These results also led to an investigation on the inside of the mine. In this case it was found that the cutting machines in the hands of new runners were being allowed to cut on the bottom as well as in the bone coal near it. The dust from this impurity was being so finely divided that it could not be eliminated by screening.

These incidents of serious trouble and their correction by simple precautions are not cited as cure-alls. Neither are they recommended to take the place of coal-cleaning machinery. They suggest, however, to a large number of practical coke manufacturers who do not always have technical knowledge at their immediate disposal how much may be accomplished toward improving their product by carefully observing the inside as well as the outside preparation of their coking coal.

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Alabama Operators to Meet

The Alabama Coal Operators' Association will hold its annual meeting at Edgewater, Ala., Saturday, July 10, 1915. A special train will leave the Louisville & Nashville station in Birmingham at 9 a.m., arriving at Edgewater at 10:10 a.m.

The morning session will be held at the local hall, where motion pictures on welfare work in mining and allied industries will be shown, together with lantern slides. Papers will also be read by H. S. Geismer, of Birmingham, consulting mining engineer, on "Coal Washing and the Preparation of Coal for Market," and by A. F. Elliott, chief electrician of the mining department of the Tennessee Coal, Iron & R.R. Co., on "Factor of Safety in Mine Electrical Installations." After a luncheon at Bayview the operators and their guests will return and inspect the commissary, plant and town at Edgewater. On returning to the hall, Milton H. Fies, vice-president of the De Bardeleben Coal Co., will read a paper on "Underground Safety Precautions," followed by Daniel Harrington, of the U. S. Bureau of Mines, the title of whose paper will be "The Use of Permissible Explosives." Motion pictures on safety methods of bituminous-coal mining and lantern slides showing the testing and use of explosives and demonstrating how explosives should be handled will be the concluding feature on the program.

COMING MEETINGS

American Mine Safety Association will hold the following meet: July 23-24, Billings, Mont. Secretary, H. M. Wilson, 40th and Butler St., Pittsburgh, Penn.

Alabama Coal Operators' Association will hold its annual meeting at Edgewater, Ala., on July 10, 1915. James L. Davidson, secretary, Birmingham, Ala.

The Order Kokoal will hold its annual pow-wow at Chicago, Ill., July 13 and 14, 1915.

The Southern Appalachian Coal Operators' Association will hold its semiannual meeting July 23, 1915, at Knoxville, Tenn. J. T. McCoy, Knoxville, Tenn., is secretary.

The United First-Aid Corps of the 4th district, Delaware, Lackawanna & Western R.R. Co.'s coal department, will hold its third annual first-aid contest at Harveys Lake, Penn., on Aug. 14, 1915. Secretary, Lewis Richards, 212 East Green St., Nanticoke, Penn.

West Virginia Coal Mining Institute

By E. N. Zern*

SYNOPSIS—The West Virginia Coal Mining Institute held its regular summer meeting at Wheeling, W. Va., the attendance being large. Some members urged that many mines were loaded with overmuch coal land and as a result could not pay dividends in slack times.

The hot-weather meetings of the West Virginia Coal Mining Institute generally fail to attract the larger crowds. Not so the meeting held at Wheeling on June 16 and 17. At the opening session, held in the assembly room of the Hotel Windsor, 60 were present, and the attendance later exceeded 150. The interest was lively throughout, and each paper was followed by general discussion.

After the mayor's representative, the president of the Board of Trade and the secretary of the Chamber of Commerce had each in turn extolled the praises of Wheeling and assured the conclave that the city bestowed the proverbial key and freedom upon them, President J. C. McKinley read his address on "Coöperation." He urged the operators to coöperate in all activities connected with the mining and selling of coal, and especially pleaded for unity among West Virginia mining men in standing behind the institute and assisting it to serve the high purpose for which it was founded.

Samuel M. McMahon, who was recently appointed to one of the three newly created mine inspectorships in the state, read a paper on "Success in Mine Management." He declared it poor policy to seek major economies by installing expensive machinery and appliances and meanwhile lose sight of minor details such as the proper use of spikes, insulators, company tools, etc. He cited a case where tin foil served as an emergency packing for a pump.

During the discussion, attention was directed to the distress in which several of the best-equipped plants in the country have found themselves during the depression and the comparative composure of the operator who, with a few battered mine cars and a string of wheezy mules, continued his output of a few hundred tons per day. Hebron Robinson hoped that the time would soon be at hand when operators would be satisfied with a reasonable acreage and cease burdening themselves with large reserves.

A business session followed and was devoted to the question of continuing the *Bulletin*, two numbers of which were issued in the months of April and May as an experiment. The secretary read his report for the first half of the year, showing receipts and expenditures fairly well balanced. It was finally voted that the paper be continued, the publishing details being left to the executive committee. It is not stated when the next number of the monthly is to appear.

Capitalizations of $5 to $6 per Ton-Year

W. E. Fohl opened the afternoon session with a paper on "Valuation of Coal Lands." At its conclusion the probable influence of the byproduct coking industry was discussed. It was thought that it would enable other seams of coal to compete with those such as the Pittsburgh in the Connellsville region, which have hitherto been regarded as being the best coking coals.

A mine, quoted in Mr. Fohl's paper, showed an investment of $1,980,000 and a coke output of 200,000 tons per annum. It consequently used about 300,000 tons of coal. This made some members question, What is the proper relationship between capital and tonnage? P. A. Grady thought a correct ratio was maintained only when the yearly tonnage equaled or exceeded the total capital invested. A coal company was cited which had to pay the interest charges on $5 of bond issue for each ton of coal hoisted.

G. M. Shoemaker in his paper, "A Mine Sprinkler," explained how a coal company, facing the coal-dust menace and compelled to conserve cash as well as coal, built a sprinkler at a low cost and it proved satisfactory in every respect. His paper was accompanied with photographs. The discussion digressed to the use of exhaust steam for moistening dust, the virtues of stone dust and the uselessness of calcium chloride as a dampening agency.

At 5:30 p.m., having been previously assured that the Ohio was free from submarines and such mines as bring terror even to seasoned coal men, the good ship "St. James" with 200 on board set forth up the river. The local Chamber of Commerce provided the excursion, also the banquet served on deck. Several of the leading citizens of Wheeling, assisted by many silver-tongued members who had been forewarned by the toastmaster, provided the after-dinner oratory.

On Thursday morning, J. A. Garcia, of Chicago, presented his paper on "Handling Wagons at Shaft Bottoms," accompanied by lantern slides showing bottom arrangements at mines in Illinois. Curiously enough, at the very time Mr. Garcia was presenting his paper two prominent engineers connected with a large West Virginia company were on their way to Illinois to see the kind of bottom installations in use there. Mr. Garcia was plied with questions relating to the construction of arches about shaft bottoms and the use of the Holmes automatic empty-car lift.

L. M. Jones, of the Bureau of Mines, then described recent developments in the use of stone dust. He made use of a number of lantern slides showing Taffanel and Rice barriers and the construction of stoppings, overcasts and door frames, charged internally with stone dust and so contrived that the force of the blast would wreck the structure and cause the inert dust to mingle with the flame of the explosion.

Keeping a "Close Tab" Indeed

"The Utility of the Telephone in Mine Operation" was presented by L. W. Brown. He warmly espoused its use and to its installation ascribed a large increase in output at a mine under his observation. One member disputed his claim. R. Z. Virgin cited an instance where the telephone proved a nuisance. The general manager of the company was city-bred and not broken to mine work

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*Secretary-treasurer and editor, West Virginia Coal Mining Institute, dean of department of mining engineering, Morgantown, W. Va.

At 9 o'clock each day the mine reported to the city office the amount of coal hoisted up to that time. If the report showed 40 tons less than on the day previous, a connection was demanded with the underground system, and trackmen, drivers, etc., were sent scouting in all directions to fetch the superintendent that he might explain the appalling drop in tonnage.

H. H. Clark, of the Bureau of Mines, opened the afternoon session with his paper on "Portable Electric Mine Lamps." He informed the institute that the bureau has added serviceability specifications to the usual safety requirements. These must be met before a lamp is "approved."

The paper by Josiah Keely on "Prevention of Mine Accidents" was minus the burden of statistics which we have come to expect when hearing this topic discussed. He contrasted the savagery in Europe, where the slogan is "Slaughter first," with the attitude of the operator, whose watchword is "Safety first." Mr. Keely presented some of the difficulties confronting the official who labors along humanitarian lines. It is not to be expected that large sums can be appropriated for welfare, sanitation and accident prevention when profits in the coal business are reduced to the vanishing point. Comment was made on the indifference of the workman to the dangers which beset his occupation and to the antagonism often encountered from the miner's union when an attempt is made to enforce discipline and the mining law.

The question-box session was devoted to workmen's compensation, mine cars, welfare work and gathering locomotives, and the time provided proved to be far too short to do justice to the topics discussed. The meeting adjourned with a vote of thanks to the good people of Wheeling for the entertainment provided.

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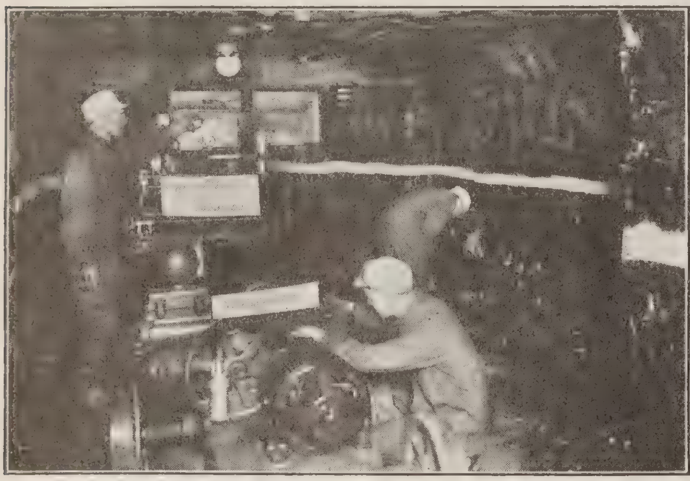
Bureau of Mines Panama Exhibit

One of the most interesting features of the exposition in San Francisco is "the mine," located under the floor of the Mines and Metallurgy Palace. The attendants in charge of this exhibit are actually experienced mine workers.

There is a main haulageway in this imitation mine, in which operate Westinghouse electric trolley and storage-battery locomotives. Metal-mine cars are used in the metal-mine section and coal-mine cars in the coal-mine section. Explosives are handled in safety magazines loaned by the Hercules Powder Co. In the pumproom, compressor-room and hoistroom the visitor will find all the modern machinery designed to fulfill pumping, power and hoisting duties.



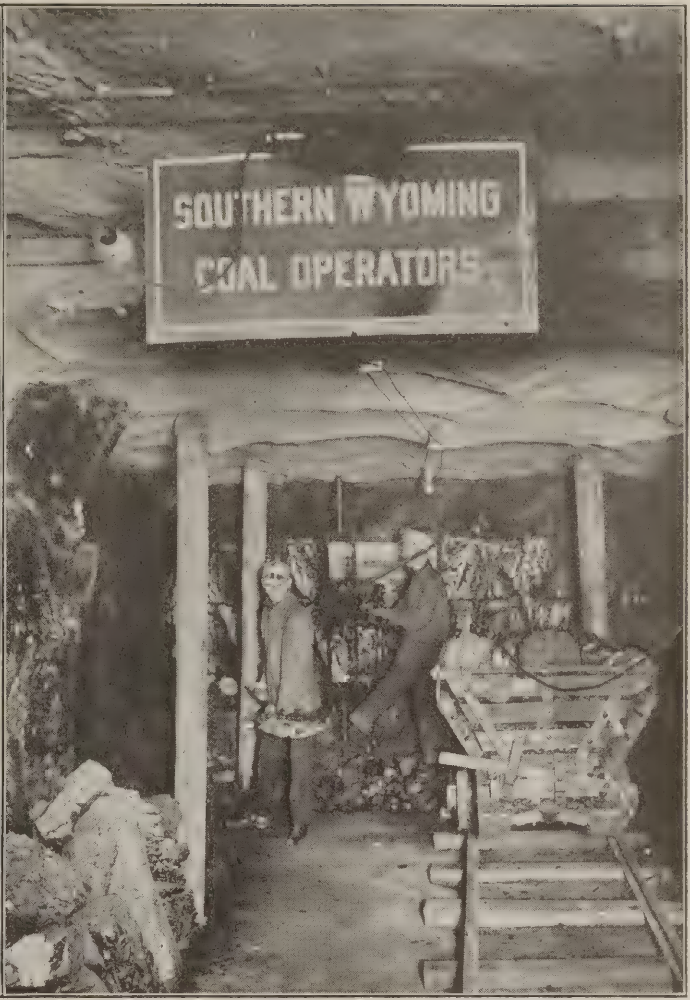
Exhibits of Jeffrey Manufacturing Co., Fairmont Mining Machinery Co. and Consolidation Coal Co.

This Exhibit Represents a Room in the Mine of the Pocahontas Consolidated Collieries Co.

E. I. du Pont Powder Co.'s Booth

Exhibit of Hercules Powder Co.

Shaft Entrance to "The Mine"



Display of Southern Wyoming Operators

There is a foreman's office, with the usual maps and other paraphernalia, an underground first-aid station and an underground surveyor's station with instruments. The coal-mining rooms and the metal-mining stopes are exact reproductions to close scale of those they represent, including the methods of timbering.

The popularity of "the mine," enhanced by the spectacular mine explosions, with accompanying first-aid demonstrations, is such that the number of visitors is so large that the attendants find it difficult properly to handle the crowds and at the same time demonstrate the exhibits.

The Labor Situation

SYNOPSIS—The union in West Virginia has made progress under Thomas Haggerty's administration. The Ohio referendum canvass will cost about $60,000 and may be abandoned. Hocking Valley operators are declared to be about to shut down indefinitely. The coöperative system in Illinois is strongly opposed by union men. More night-riding occurs in western Kentucky.

Apparently C. J. Albasin, the district president of the eastern Ohio miners, is not the only labor leader with a fight on his hands. Thomas Haggerty, member of the International Board of district No. 2 (central Pennsylvania), finds the central West Virginians disposed to split and to disparage his services. In a long manifesto he reviews his work, as he sees it, since November, 1912, when he first visited the field for a short time, to return for a longer stay in January, 1913. He states that there were only 1376 members of the union in the Kanawha field at that time, whereas there are now 7500 members. Two years ago there were 48 unions, whereas there are now 310. There were then 21 coal companies that signed contracts with the union; now there are 127 so signing. Mr. Haggerty says that the guard system is abolished, wages are raised 14½ per cent., the checkoff established, a 9-hr. day introduced, a semi-monthly pay secured and checkweighmen provided on all tipples. Thomas Haggerty has been accused of using the funds of the union to secure the election of L. C. Rogers and his associates. The committee of the International Executive Board has completely exonerated him and the men elected.

Ohio Referendum Canvass Apparently Too Expensive

In Ohio it appears to be doubtful whether anything will be done to dispossess the Gallagher amendment to the Green anti-screen bill. The union begrudges any expenditures after its long and expensive strike campaign and discovers that the canvass for the referendum petition by which it purposed to upset the Gallagher amendment would cost about $60,000. The officials are loath to spend such a large sum.

The Ohio referendum law provides that petitions of that character must have at least 46,000 signers and these must live in 45 counties of the state. Only 28 counties out of the 88 in Ohio produce coal, and 7 of these produce it in negligible quantities. For this reason the petition will have to circulate in many counties having no coal.

About 1 in every 100 of the 4,767,121 inhabitants of Ohio will have to sign the petitions, and if the canvass is restricted to 45 counties the proportion of signers must be even greater. It is well to remember in this connection that only a small proportion of the inhabitants of Ohio have votes and therefore can sign the petition. Moreover, the farmers are by no means pleased with the long strike and believe that the miners should have accepted the operators' proposition, and in any case they would be disposed to avoid putting the state to the expense involved in a referendum.

A definite announcement will be made about a week hence by John Moore, president of district No. 6, comprising the mining region of Ohio. The proceedings must be hurried as the law allows only 90 days' time for action after the passage of the bill.

The Sunday Creek Co., alleging that it has been betrayed by the eastern Ohio settlement, has closed its mines and its company stores in the Hocking Valley and will supply its orders from its West Virginia mines. The company declares that the new schedule in the eastern Ohio mines is 5c. per ton lower than it would have been had the only change made in that scale been to make the rate of mining 47c. per ton for machine-mined run-of-mine coal. The assertion is tantamount to a declaration that the new scale in the eastern Ohio district is about 2½c. per ton lower than it was before the strike. The miners in the Sunday Creek region are in dire straits, as they can obtain no credit from the local merchants.

Coöperative System is a New Method of Reducing Wages

The coöperative system is making much trouble in Illinois. On May 13 Thomas T. Brewster, president of the Coal Operators' Association of the Fifth and Ninth Districts of Illinois, wrote to Frank Farrington and the State Executive Board of the United Mine Workers of America protesting against coöperative mining. The men at these mines are paid the union scale less the pro-rata losses of operation. The result is practically an evasion of the scale, and Mr. Brewster threatened to demand a new contract.

The miners' union does not like this form of coöperation any better than the operators. The men who are practically working for less than union wages are getting steady work while others who are employed at noncoöperative plants are working short time. On May 20 Frank Farrington addressed a strongly worded letter against such coöperation to the officers and members of District 12.

Winkle, in Perry County, Ill., is one of the important centers of the coöperative plan, and the Bald Eagle Mining Co. is one of the companies. There has been trouble between the miners who work for the company on a coöperative basis and those who object to such a plan. Threats have been made, and Sheriff Charlton of Perry County has sent deputies to the plant and seized all the weapons he could find in the hands of both factions. The mine is located at Craig, Ill., and in 1913 there were 120 miners employed.

The United Mine Workers of America in Muhlenberg County, Kentucky, have passed resolutions condemning "night-riding" and other violence and declaring that all such acts are in direct conflict with the interests of organized labor.

It is stated that S. F. Cates, a landowner and operator of a small mine four miles south of White Plains, Hopkins County, Ky., has been in Madisonville, Ky., trying to sell his property, stating that he had been severely whipped by "night-riders." He displayed the scars of the whips on his face and reported the attack to the county authorities. He said it was his intention to leave the state as soon as he succeeded in selling his property.

John P. White is scheduled to make 32 addresses in the anthracite region between July 8 and July 29, beginning at West Scranton on the first date and ending the campaign at Shickshinny, Penn.

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Byproducts from Coal

The tree appearing in this article was prepared from one made by W. J. A. Butterfield, of London, England, and presented to a conference on the extension of British trade. It shows what byproducts can be extracted from coal in the gas industry. The figures have been changed, as long tons and hundredweights were used in the original table and the gallons used were imperial. Such gallons contain 277.274 cu.in. instead of 231 cu.in., which is the capacity of the American gallon. The imperial gallon is therefore 1.20032 times as large, but as the ton taken by Mr. Butterfield was 1.12 times larger than the short ton the figures were increased by multiplying by 1.07171.

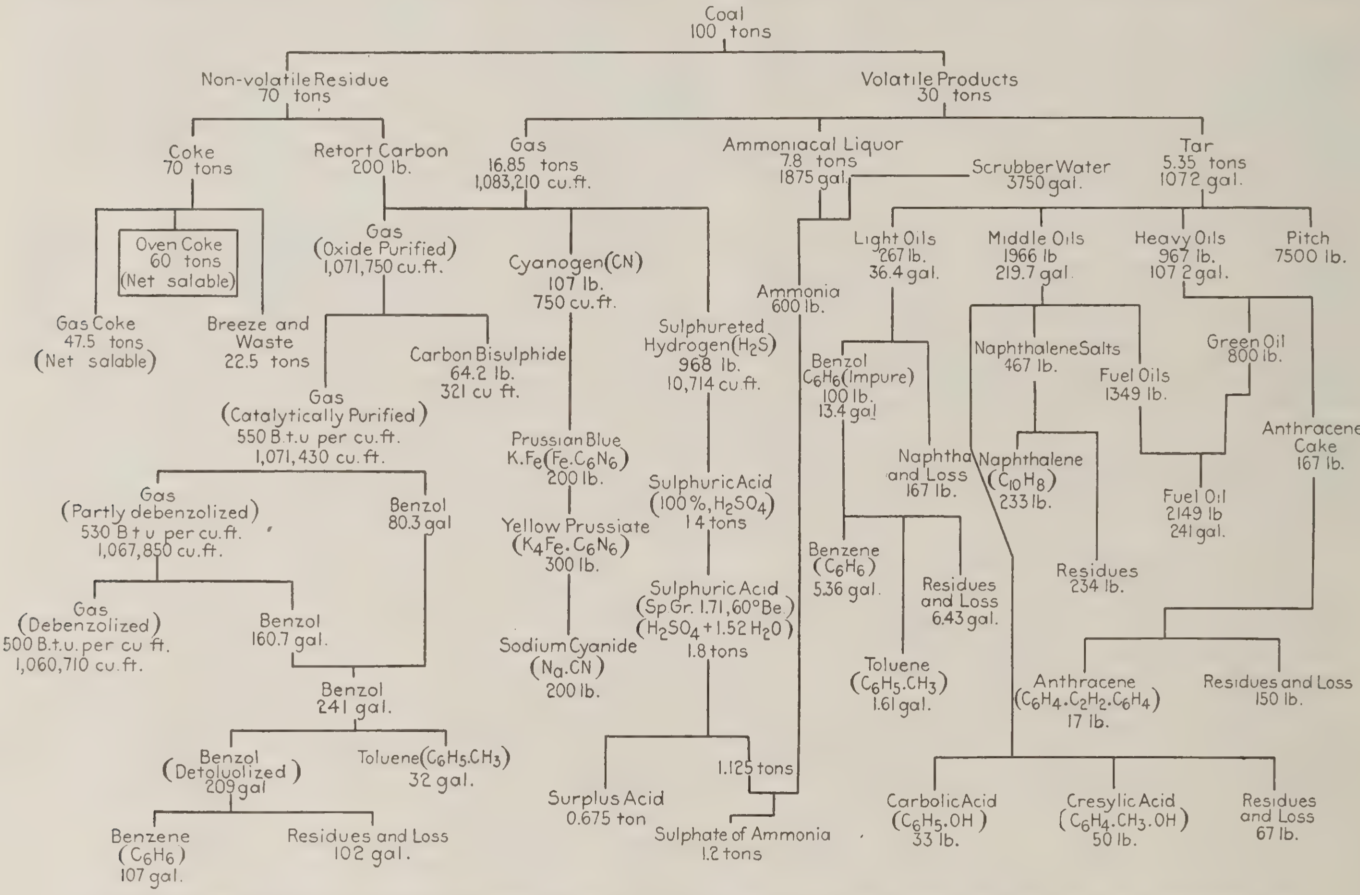
Coal 100 tons
Non-volatile Residue 70 tons
Volatile Products 30 tons
Coke 70 tons
Retort Carbon 200 lb.
Gas 16.85 tons 1,083,210 cu.ft.
Ammoniacal Liquor 7.8 tons 1875 gal.
Scrubber Water 3750 gal.
Tar 5.35 tons 1072 gal.
Oven Coke 60 tons (Net salable)
Gas (Oxide Purified) 1,071,750 cu.ft.
Cyanogen (CN) 107 lb. 750 cu.ft.
Light Oils 267 lb. 36.4 gal.
Middle Oils 1966 lb 219.7 gal.
Heavy Oils 967 lb. 107.2 gal.
Pitch 7500 lb.
Ammonia 600 lb.
Gas Coke 47.5 tons (Net salable)
Breeze and Waste 22.5 tons
Sulphureted Hydrogen (H2S) 968 lb. 10,714 cu.ft.
Carbon Bisulphide 64.2 lb. 321 cu ft.
Benzol C6H6 (Impure) 100 lb. 13.4 gal
Naphthalene Salts 467 lb.
Green Oil 800 lb.
Fuel Oils 1349 lb.
Gas (Catalytically Purified) 550 B.t.u per cu.ft. 1,071,430 cu. ft.
Prussian Blue K.Fe(Fe.C6N6) 200 lb.
Anthracene Cake 167 lb.
Naphtha and Loss 167 lb.
Naphthalene (C10H8) 233 lb.
Sulphuric Acid (100%, H2SO4) 1.4 tons
Fuel Oil 2149 lb 241 gal.
Gas (Partly debenzolized) 530 B.t.u per cu.ft. 1,067,850 cu.ft.
Benzol 80.3 gal
Yellow Prussiate (K4Fe.C6N6) 300 lb.
Benzene (C6H6) 5.36 gal.
Residues and Loss 6.43 gal.
Residues 234 lb.
Sulphuric Acid (Sp.Gr. 1.71, 60° Be.) (H2SO4 + 1.52 H2O) 1.8 tons
Gas (Debenzolized) 500 B.t.u. per cu ft. 1,060,710 cu.ft.
Benzol 160.7 gal.
Sodium Cyanide (Na.CN) 200 lb.
Toluene (C6H5.CH3) 1.61 gal.
Anthracene (C6H4.C2H2.C6H4) 17 lb.
Residues and Loss 150 lb.
Benzol 241 gal.
Benzol (Detoluolized) 209 gal
Toluene (C6H5.CH3) 32 gal.
1.125 tons
Surplus Acid 0.675 ton
Carbolic Acid (C6H5.OH) 33 lb.
Cresylic Acid (C6H4.CH3.OH) 50 lb.
Residues and Loss 67 lb.
Benzene (C6H6) 107 gal.
Residues and Loss 102 gal.
Sulphate of Ammonia 1.2 tons

Table Showing the Various Byproducts of Coal with Some Few Other Bodies Chemically Compounded from These Byproducts

Of course sodium cyanide, yellow prussiate and prussian blue are not direct derivatives from cyanogen. The figures given are those obtained in practice. Theoretically every pound of cyanogen makes 1.88427 lb. of sodium cyanide, 2.3599 lb. of yellow prussiate and 1.96661 lb. of prussian blue.

Editorials

The Climate of the Mine

At the close of the Eighteenth Century people still believed that the sea air was extremely detrimental to health and the well-to-do people went to inland watering-places. It was the day when, in England, Beau Brummel was the prince of dandies and Tunbridge Wells the home of fashion. Gradually the doctors decreed in favor of the sea, and the word watering-place took a new meaning, and Brighton consequently came into the forefront.

The American people, when they followed the British example of taking vacations, took trips to the sea. From the very first they profited from what was even then the general practice in Europe. Today not one in a thousand knows that the doctors ever taught that sea air was dangerous.

Similarly the alleged dangers of mountain air long kept people out of Switzerland. It is quite recently that we have learned that such air is invigorating and not to be feared if the heart is strong, and we are positive today that some people are bettered by the light air of mountain regions.

In like manner night air persisted as a bogy for many years—in fact, till a far more recent period. The people shut it out of their houses in deadly fear that it would subject them to disease. Now we know that the night air is even better than the air of the day because the sun's warmth favors the growth of bacteria and because in all probability at night the descending dew carries with it millions of microbes and dust particles.

Our view of the climate of the mine is also changing slowly. The scientists used to invent something they were pleased to call "mephitic exhalations." They peopled the "damps" of the mine with every kind of evil and represented them as deleterious as those around swampy places. The dangers of the latter we now know were largely microbial and were spread, not by the damps themselves, but by the mosquitoes and flies.

But it must be admitted that the mines in earlier days were not any too desirable from the standpoint of health. The air used to be so seldom changed, the methane was burned out and not swept away from the faces, and conditions were none too good. But the coal mine today is different. The air is coursed rapidly past the working faces. It comes to the mine, in summer, hot and full of moisture. When cooled in the shallow mines the moisture falls and deposits the impurities, and though there is much suspended coal dust it is harmless.

Those "mephitic exhalations"—pardon the term—moreover are more harmful by far to the smaller microbial and bacterial forms of growth than to our larger organisms, just as water which is harmful to fish has no observable effect on man.

Perhaps the time will come when we will believe the mines the most healthful of places. They seem to agree well with the mules that live in them from year to year and never come to the surface. It may be permissible also to add that the sterilizing effects of their waters largely prevent blood poisoning in those who may be injured. We are slowly beginning to realize that the worst habitat for man is the factory, the saloon, the theater, the church, the school and the home and other places where people can infect one another and where they are apt to shut themselves in. In cool mines, with good ventilation, the conditions for health are at their best. "The evil that men do" to their health comes after they leave the mines.

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Carlyle, Bryan and King

We owe a debt to Mr. Bryan for quoting the following lines from Carlyle in his letter to the people entitled "The Causeless War." That debt is the greater because his quotation raised havoc with his argument. If the elected representatives of the people of any country cannot bind the people of that country, surely Mr. Bryan cannot derive any hope that the chancelleries of Europe can effectually bind those they even less closely represent.

We have little faith that the legislation of representatives truly exhibits the contemporary judgment of the public, but surely the actions of parliaments are more in accord with the popular will than the actions of chancelleries, which in many countries lay not the slightest claim to be representative and which even in our country, checked as their actions are by the Senate, are sometimes found to be strangely out of accord with the national intentions.

For instance the agreement about the Panama Canal made by the Secretary of State and confirmed by the Senate proved to be a most unpopular measure and was upheld by the executive only with difficulty. The public showed a disposition to reject it and would not even consent to have the treaty officially interpreted by the Hague tribunal.

The quotation from Carlyle to which reference has been made runs as follows: "Hast thou considered how thought is stronger than artillery parks, and writes and unwrites acts of parliament, removes mountains, models the world like soft clay."

The spirit of the pronouncement of Carlyle has been repeated recently by Mackenzie King, and all the foolish raisers of strife in Colorado and New York and many of the legislators in the former state have declared against the treason that any man should believe that anyone could do good by power of suasion and generous support of ameliorative measures.

Only those who advocate disorder and discontent or seek to make restrictive laws are allowed to believe they can and are doing good. All the apostles of coercion by law, all the advocates of unlawful violence and all the sinister seekers for political preferment like P. J. Walsh have professed to be shocked at King's statement that "the will and conscience of John D. Rockefeller is more powerful in Colorado at present than any force that could be brought to bear to better conditions."

We are fully of Mr. King's opinion. We will add furthermore that we would make the same statement of John R. Lawson and Mother Jones as he has made of John D. Rockefeller if those two breeders of discontent were together or singly to seek, like Rockefeller, the pacification and betterment of Colorado. For men are better than legislators, and leaders are more than laws. We believe that a generous consideration of labor problems will eventually end social strife. In the end law will do but little. It is "the letter that killeth and the spirit that giveth life." And if a man of influence by reason of past association or by wealth devotes himself to the Colorado problem success is quite likely to follow.

So far from King's statement being un-American, it is animated by the best principles of our civilization. We believe that the public should not be dragooned by law, but led into the right course by suasion.

There is little virtue in enactments unless they are backed by public sentiment, and the law and order that some seek which would permit the burning of mine plants and deny to the owners the right of defense is an order which, while it may commend itself *at times* to the Colorado legislature, or parliament, is advantageous to no one, certainly not to the workmen, and it can never bring peace.

The animus against the Rockefellers is largely a manufactured sentiment. Like Robin Hood, the older Rockefeller has largely despoiled the rich by methods formerly followed by the general busmess world and enriched the poor by the giving of liberal wages. One of the charges against the older Rockefeller which has stuck is that he paid his men in the oil fields of Pennsylvania wages bigger than his competitors could afford and gave his men model treatment without any taint of paternalism.

One cannot understand why, to the workingman, Rockefeller has not been a popular idol. Those well-to-do who have suffered from his competition are far more willing to do him honor than the workingmen to whom he was always a ready paymaster and an unmagnetic though by no means an ungenerous friend.

He is largely the victim of the organized discontent of the coal fields, and it would seem that he must often contrast the frugal, industrious, appreciative American employees in the oil fields of Pennsylvania who pumped his wells and pipe lines with the polyglot and too often discontented people he now has to deal with on his coal-mining properties.

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The Hypochondriacs

Hypochondria is a most painful depression of mind or spirits. The patient who suffers from it usually reads all the patent-medicine advertisements and sincerely believes he has all the diseases mentioned. This evil is so common that some doctors have seriously suggested that advertisements suggesting ailments and asking the question, Do you have this or that? be suppressed.

But hypochondria is not found solely with regard to bodily ills; it is unfortunately frequent in relation to matters political. The operator often has the disease with regard to his employees. He imagines that all kinds of unholy purposes animate them. Just as a true hypochondriac dwells on one symptom till he imagines he has every disease, so your operator dwells on the folly of one man, expands it and applies it to a whole class.

And hypochondria among the workingmen is also most prevalent, and the danger of it is heightened by the lurid literature current regarding the diseases of society. Sometimes the public feels that these treatises on imagined human frailty should be suppressed so that the men with weak minds may be saved from misapprehension, and then again the problem arises as to just who could decide what leads to hypochondria and what tends to health.

The disease of hypochondria is common enough, as a review of contemporary literature proves. Therefore the duty of every citizen who is sane and sound is to be always as ready to give his views as are those who are victims of hypochondriacal obsession. Unfortunately both operators and men too often make these mental wrecks their leaders and strive not to controvert their perverted visions, but actually try to believe the fallacies they teach.

But on further thought is not that statement tainted with hypochondria, for capital and labor have been frequently led by the sanest kind of leaders, such as Gary, Rockefeller, White, Lewis and Mitchell? After all, sanity is encouragingly in the majority and the great mass of men refuse to follow where hypochondriacs lead.

⁂

A Legal Decision Interesting to Coal Men

The Supreme Court decision in the National Cash Register case will prove encouraging to the mining industry. Many mine owners and operators have been prevented from engaging in coöperative measures because of the uncertainty of the construction of the Sherman antitrust laws by the courts.

Most men want to do the right thing, but what may seem perfectly right to one may appear as quite wrong to another, especially to those not familiar with the situation. The courts are the impartial judges to determine whether such coöperative actions are necessarily illegal, for if they are needful to one side they may not be injurious to the other. The decision will be welcomed especially by the coal interests that are now considering the adoption of economic coöperative measures.

⁂

Reducing Sizes of Anthracite

For a number of years past Philadelphia dealers have discussed the advisability of requesting the mining companies to reduce the number of domestic sizes of anthracite from four—namely, egg, stove, chestnut, and pea—to two. The idea of many was to mix the egg and stove sizes and call the outcome "heater" coal, and then to create a size called "range" coal from the mixture of chestnut and pea sizes. The dealers favoring the change contended that the two sizes would answer every practical use now secured by four and that the dealers would then have to provide storage room for two sizes only.

The agitation finally resulted in the presentation of a formal resolution at a meeting of the Philadelphia Coal Exchange on May 27. The proposition was argued at great length from all angles, with the result that the exchange unanimously decided against the suggestion, and furthermore, instructed the secretary to send copies of the resolution covering its action to all the producing companies, because many of them had been approached on the subject by individual dealers. A change in sizes is likely but it will not be so radical as that just described.

Sociological Department

Manager's Round-Table Talks

The officials of the Utah Fuel Co. will hold meetings monthly so as to enter into closer relationship with one another and create a better *esprit de corps.* Such gatherings will help them to interchange ideas and to collaborate in the consideration of problems of vital interest to the company.

The attendance at these meetings will not be restricted to superintendents, but the resident engineers and foremen of the various mines will be invited to attend as well as visitors from the outside who may be interested and able to give valuable suggestions.

The first meeting was held Apr. 26 at a camp where a new field of coal was being opened. The workings at this place presented some features with which most of the officials had not, as yet, had experience. The new work consisted of lining with concrete a haulage tunnel through a stratum of rock that disintegrated upon exposure to air. Part of the tunnel was lined with reinforced concrete and in part the sides and roof were coated with cement mortar, all the work being done by the pneumatic method.

Upon their arrival at the camp the members of the party donned their pit clothes and went into the mine and saw the men spraying the tunnel with cement mortar. They then went to the coal faces and inspected the results of experiments with Red H No. 5 powder. These experiments had been previously made by the resident engineer, and the miners had been instructed how to obtain the best results with the minimum number of shots and the smallest quantity of powder. These results have proved that it pays both the miner and the company to carry on scientific investigation and instruction.

After supper the party gathered in the mine office, and with the aid of cigars furnished by the company proceeded to business. Five superintendents, three engineers, including the chief, two foremen and the general superintendent were present, the latter presiding.

It will be the custom at these meetings for the general superintendent to review first the results of the preceding month's operations at the mines. The lowering of costs or the improvements in mine conditions will be noted and the efforts of successful officials praised. Poor results will not be specifically mentioned, as the desire of all the superintendents is to keep at the top of the list, and commendation for the successful and not censure for the less competent is the remedy for poor records.

As the April meeting was the first held, no particular subject was taken up for discussion, but all present were requested to state what subjects they thought were of greatest importance.

At this meeting the following subjects were proposed: Standardization of materials and methods of using same, safety first, quantity of day's work for different grades of workmen, sanitation of camps, harmony and coöperation in departments, systematizing the distribution of tools and materials in mines, recovery of material in retreating work, proper methods of drawing pillars, standard tracks and methods of laying, quality of product, correct blasting methods and education.

These twelve subjects will keep the conference busy for at least a year. In view of the fact that the Utah Fuel Co. has already taken the first step toward instituting a campaign of education for foreigners in all its camps it was decided to have "Education" for the topic of the next regular meeting. After the meeting had adjourned the rest of the evening was spent in conversation.

◆

Saving Ten Million Dollars a Year

Statistics gathered as to the money sent abroad from Wilkes-Barre during the first six months of 1914, before the outbreak of the war, leads to the conclusion that an outflow of nearly $10,000,000 a year from the anthracite coal fields of Pennsylvania has been stopped. The amount of money sent from Wilkes-Barre through the post office, banks and ticket agencies from Jan. 1 to July 1, 1914, was approximately $350,000. That sent through the post office includes the Kingston, Parsons, Luzerne and Ashley branches, which means that a population of approximately 75,000 shipped this amount.

The counties of Carbon, Lackawanna, Luzerne, Northumberland and Schuylkill, in which 96 per cent. of the anthracite is produced, have a population of about 1,050,000 persons, so that if money was shipped proportionately from all parts of the region the amount for six months would be $4,900,000. The amounts of money sent to Europe are largest during the Christmas holidays, so that the total annual sum cannot have fallen far short of $10,000,000.

The greater part of this was formerly remitted to Russia, Austria, Germany, Italy, Greece and the Balkan States. The sums sent to the Suwalki region in Russia, recently the scene of desperate fighting, were especially heavy. The *Wall Street Journal* recently estimated the annual amount of such remittances from the United States at $250,000,000, of which $100,000,000 went through the post office and the rest through banks, immigrant bankers and steamship and ticket agencies. The remitting of this money abroad by our alien population has now practically stopped.

All the money sent abroad from the anthracite coal region is saved out of the wages of the foreign-born workers in the anthracite mines. Of recent years the amount has decreased because the miners are buying their own houses and investing their money locally. Local bankers state that the maximum remittances were made a decade ago, when laborers were more accustomed to work here for a few years and then retire to their native lands on their savings. The decline in the amount of money sent abroad is a sign that the foreigner is now taking root.

Discussion By Readers

The Mine-Car Question

Letter No. 3—Cars used in the bituminous mines are built in a great variety of styles and sizes and for widely varying gages, but they seldom have a capacity exceeding 100 cu.ft., or about 2½ tons. In the majority of mines, the capacity of the cars is much less, averaging from 1½ to 2 tons. The cars are usually built with outside wheels, and the sides of the car are flared above the wheels so as to provide an increased capacity. They are mostly built of wood, although steel is used to a limited extent in these mines.

In the accompanying sketch I have shown the styles of mine car that are best adapted for use in thin seams and seams of moderate thickness. I have assumed an average thickness of 3 ft. in the first case and 6 ft. in the latter. The cars are shown as standing on the entry track. It may be assumed, however, that wood rails are used in the rooms, particularly in the thin seams. These cars, for an inside length of 6 ft., allowing 40 cu.ft. per ton and assuming a topping of 6 in. in each case, will have a capacity of 1600 lb. in the 3-ft. seam and 2 tons in the 6-ft. seam, using 10-in. wheels in the former and 16-in. wheels in the latter case.

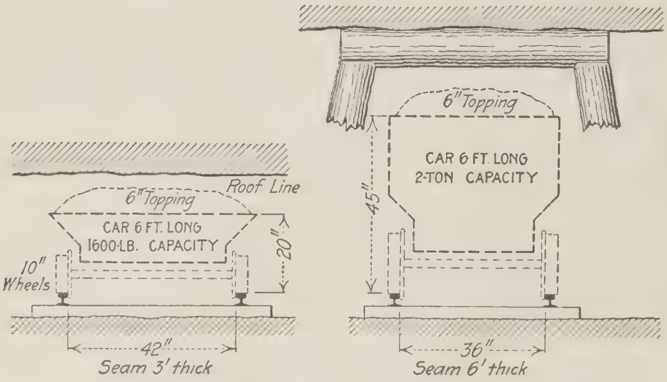

Diagram of Cars in Thin and Thick Seams

The capacity of the car is determined by the desired output, length of haul, grade of haulage road and the kind of haulage employed, which determine the number of cars that can be hauled in a trip and the speed of hauling. Due regard must be had, also, for the size and weight of car that can be safely handled under the conditions existing in the mine. On good clean level tracks men can push cars that weigh 3000 lb. and carry a load of 2½ tons, making a total moving load of 4 tons for a loaded car. Such a load, however, is difficult to start and stop. Cars that must be moved by hand should not weigh to exceed 2 or 3 tons at the most when loaded. In this regard, however, much will depend on the condition and kind of track over which the car must be moved.

The size or diameter of the wheels greatly facilitates the movement of mine cars. Cars having 14- or 16-in. wheels are moved much more easily than cars of the same size having 10- or 12-in. wheels, other conditions being the same. Narrow track gages permit cars to be moved more easily than broad gages. In coal-mining practice the gage of haulage tracks varies from 28 to 42 in. ordinarily, depending mostly on the size of the car. The wheelbase, or distance from center to center of the car axle, rarely exceeds 42 in., and is often considerably less than this. Cars having a short wheelbase can be used on sharper curves in the track; also, when derailed, they are more easily replaced on the track.

When the capacity of the car has been determined, in accordance with the conditions mentioned, the dimensions must be made to conform with the width of the hoisting shaft, the nature of the roof and floor, and the thickness of the seam. For example, in mines where it is necessary to take the cars to the face to be loaded, the thickness of the seam practically limits the *height* of the car. Again, a bad roof or a soft, heaving bottom often necessitates the driving of narrow entries, and this limits the *width* of the car, making a certain allowance for clearance on each side of the road. The *length* of the car is generally limited by the width of the hoisting shaft. In determining this dimension, a sufficient allowance must be made for clearance in the shaft. This should vary from 6 to 10 or 12 in., according to the condition of the shaft. In the absence of specified details, an allowance of 6 in. for bumpers and end-boards should be made at each end of the car. The dimensions, length, width and thickness, are estimated from the required capacity as inside measurements.

George Stockdale.

Mt. Braddock, Penn.

Letter No. 4—I have noted with much interest the discussion that has recently arisen in reference to mine-car construction. My attention was first attracted by the article of R. Z. Virgin, Coal Age, May 1, p. 752.

While I have never been a believer in large, heavy and expensive mine cars where a lighter car would answer the purpose, it must be recognized that conditions of mine haulage have greatly changed from the time when there was not the demand for coal that there is at the present day. The output of the mine was small, and mules were used to haul the cars underground. The cars for that purpose could be built light and were inexpensive.

The present great demand for coal has led to the employment of electric or compressed-air locomotives, which have largely replaced the mule on the main-haulage roads of every uptodate mine. The mine cars for this service require to be built more substantially so as to withstand the heavy bumping and jerking incident to the haulage of trips varying from 100 to 200 tons.

The question of what constitutes the best mine car should be left largely to the coal-mine operator to determine, although I freely admit that there is a wide variation of disposition on the part of many operators who often will not hestitate to spend $2000 for an electric locomotive to take the place of mules underground, believing that the electric locomotive will do the work more economically. The same operator, however, will hesitate to replace his mine cars with cars better adapted to a heavier service because of the increased outlay required. This may be poor judgment, but is, nevertheless, the condition that must be met by the manufacturers of mine cars.

As a result of this condition, we have in our shop-files over 2000 drawings of mine cars of different patents and varying in sizes and dimensions. In our general catalog, we illustrate 25 of these designs built for track-gages varying from 36 in. to 56½ in. I may say that we have never yet, in our experience, built indentically the same car for any two companies. The reason for this is to be found largely in the fact that no two coal mines are operated under conditions exactly similar in every respect. The car that is suitable for one mine will not answer for service in another mine.

In general, it may be said that the question of daily output together with the conditions existing in the underground workings determine the required capacity and size of the mine car. Again, the height of the mine car above the rails is much dependent on the thickness of the seam and is modified, also, by the question of whether the output of the mine is for steam or domestic use. In our experience, for *domestic* coal a larger percentage of lump is loaded and, in this case, a greater clearance must be allowed above the top rail of the car. Also, the side- or end-boards must be low to permit of the loading of large lumps of coal.

Strange to say, even the method of paying the men controls, to some extent, or modifies the style of car that is desirable. For example, if the miners are paid by the car, they will load their cars only level with the top rail, and will not build them up with a "topping" of coal, as is the general practice where the miners are paid by the ton. It often happens that a coal operator is forced to pay at the same rate on the same basis as another adjoining mine and, for this reason, he is subject to a loss unless he has a car of the same size and weight as that of his neighbor.

In closing, I may say it is our experience that there are more operators using cars that are too large than too small. In our practice, we have probably cut down a hundred different cars or reduced their size on the second order, but I do not recall that we have ever filled a second order with a size *larger* than that called for in the first order. It is worthy of note, however, that where a certain wage scale governs a district, this fact will often make it absolutely necessary for operators to employ cars of light dimensions or capacity.

In considering this question, it is, of course, readily admitted that the lighter the car the more easily it is handled at the working face, and this is a big advantage as it largely affects the daily output of each miner who must load and handle his car in his own room. The question that must be determined in each case is, therefore, whether such car can be handled and loaded economically, taking all these matters into consideration. I do not believe that any absolute rule can be laid down that will determine the size and shape of a mine car for service in all seams of coal and under all conditions of haulage. Each problem must be treated independently to satisfy its own conditions.

H. W. Sanford.

Knoxville, Tenn.

Recent Compensation Act in Pennsylvania

Letter No. 1—Since the passage of the Workman's Compensation Act by the Assembly of Pennsylvania, May 18, 1915, I have been expecting to see in Coal Age some comment on the bill, either editorially or otherwise. This measure has been struggling for birth in the legislature for several sessions and its natal day should not pass altogether without some expression of opinion from the class of people whom it is *supposed* to affect. A discussion of its economic value as a law would be of interest.

At the expressed demand, no doubt, of a majority of her citizens, Pennsylvania has followed the example of numerous other states and passed a law that is expected to be of material benefit to the large class of industrial workers in the state. The measure was for a time successfully opposed by those who feared its effect on their interests, but harmony at last prevailed and the measure received the unanimous approval of all parties concerned.

For the protection of corporate interests affected by this law, the Pennsylvania workman's act contains the following proviso, art. III, sec. 302:

> (a) In every contract of hiring made after December 31, 1915, and in every contract of hiring renewed or extended by mutual consent expressed or implied after said date, it shall be conclusively presumed that the parties have accepted the provisions of article 3 of this act and have agreed to be bound thereby, unless there be, at the time of the making, renewal or extension of such contract, an express statement in writing from either party to the other, that the provisions of article 3 of this act are not intended to apply, and unless a true copy of such written statement, accompanied by proof of service thereof upon the other party, setting forth under oath or affirmation the time, place and manner of such service, be filed with the bureau within 10 days after such service and before any accident has occurred.
>
> Every contract of hiring, oral, written or implied from circumstances now in operation, or made or implied on or before December 31, 1915, shall be conclusively presumed to continue subject to the provisions of article 3 hereof, unless either party shall, on or before said date, in writing, have notified the other party to such contract that the provisions of article 3 hereof are not intended to apply, and unless there shall be filed with the bureau a true copy of such notice, together with proof of service, within the time and in the manner hereinabove prescribed; provided, however, that the provisions of this section shall not be so construed as to impair the obligations of any contract now in force.
>
> In the employment of minors, article 3 shall be presumed to apply unless the said written notice be given by or to the parent or guardian of the minor. It shall not be lawful for any agent of this commonwealth, or for any county, city, borough or township therein, or for any officer or agent thereof, or for any other govermental authority created by the laws of this commonwealth, to give such notice of the rejection of the provisions of this article to any employee of the state or of such governmental agency.

It does not require a very careful study of this section to reveal the fact that, instead of the employer being compelled to become a contributing party to the liquidation of the compensation to an injured employee, as the different provisions of the act require, he is by this section legally armed with the power to annul all rights to claims against him for damages or injuries sustained.

The daily press has heralded this act as being "the most important piece of legislation that has passed the Assembly for years." If its importance measures the benefits conferred on a single class only, it may be considered as one of the most important pieces of class legislation that has ever been enacted in the State of Pennsylvania or any other state.

At the present time, an injured workman possesses the right of seeking redress through a process of common law and stands some chance of securing the granting of his claim. When the present act goes into operation, Jan. 1, 1916, the individual worker will be compelled by the law to relinquish this right, provided the act be upheld as being constitutional, as it undoubtedly will be unless this feature is successfully fought by those most interested.

Not being a lawyer, either constitutional or any other kind, I would not hazard a statement as to the part or parts of this act on which its constitutionality could be contested; but as a member of the laity, it appears to me radically wrong and a usurpation of individual rights. It seems reasonable no law can compel a man to sign away, not only his own, but the personal rights of those dependent on him, in order to secure employment and earn a livelihood.

I believe that the common law emphasizes the point that any affirmation, promise or contract made under duress is not obligatory on the part of the maker. If this be true, why should not a contract containing conditions at variance with legalized rights be regarded as void if not criminal? The former is a compliance secured through physical fear; the latter is a compliance secured through physical necessity. What is the difference between the means employed and the ends secured in either case, except that in the latter the criminality of the means will be legalized?

The right of contract should cease or be declared void when its exercise involves conditions that are inimical to the interests of either contracting party. I do not regard it as a refutation of the argument or a vindication of the act that the right of contract is an inalienable right; it undoubtedly is so when the contracting parties are untrammeled and uninfluenced by the demands of necessity, and I believe that the law assumes that a contract or agreement to be valid must be made by the voluntary action of each of the contracting parties.

By the section of the act to which I have referred, the state has placed in the hands of one class of its citizens the power to compel the acquiescence of another class to its demands.

The industrial classes of the state have "asked for bread and have been given a stone;" they have begged for an amelioration of their condition and the bands of subjection have been drawn tighter by their legislators.

The working classes of Pennsylvania are desirous of securing assistance for those of their number who may be placed in straitened circumstances through the accidents incident to their occupation. They have given their unrequited time, labor and coöperation in their efforts to advance all provisions for safeguarding life and reducing accidents, and I cannot believe that they ask for compensation for accident at the undivided expense of any one class, but they are willing to pay their proportionate share, in conjunction with their employers, for the establishment and maintenance of such a fund. Pennsylvania should be ashamed of having gained the distinction of enacting one of the most farcical pieces of legislation that has ever disgraced the statute books of the state.

A. M. INER.

——, Penn.

Labor in Mining

Letter No. 7—Reading the account given in "Extracts from a Superintendent's Diary," COAL AGE, June 5, p. 964, of a mine strike that resulted in the killing of two nonunion miners calls to mind my own personal experience in a strike at the mines of the Westmoreland Coal Co. a few years ago.

One summer evening an Italian organizer and a score of Italian strikers from Latrobe got off the train at Ligonier. Going to a barroom, they purchased several bottles of whisky and made their way up the Ligonier Valley R.R. to Wilpen, to the plant of the Marietta-Connellsville Coke Co. Here the organizer called a meeting and told the miners to quit work, promising them a weekly relief check while they were idle. He told them, however, that they must work for it and not sleep until 10 o'clock, but must fight hard those "scabs" in order to win the battle.

A big demonstration was arranged and everyone was notified to be at a certain point at 3 o'clock the next morning, when they would march to Waterford, a distance of about two miles. They were to be armed with revolvers and to compel the men working at the Fort Palmer Coal & Coke Co.'s plant to stop work.

They met at the time and place appointed and had gone about half a mile when they overtook two miners riding in a buggy, who were ordered to turn and join the ranks. Upon their refusal to do this, some shooting occurred, one of the strikers grabbing the horse by the bridle while others fired at the men sitting in the buggy. Word soon reached the state troopers stationed at Ligonier, and four of them immediately started to the scene. The miners, on reaching the crest of the hill, saw the troopers galloping along Waterford Pike. Believing that the officers would search them for guns, they all with a few exceptions gave their weapons to two of their number who were hurriedly chosen to carry them away. There were 106 revolvers of various calibers. The two men, with some difficulty, carried these instruments to Frank Bolha's store, where they hid them. This only prevented the riotous and murderous acts that would have followed had the men kept their weapons.

I was also much interested in Letter No. 4 by Karl F. Schoew, June 12, p. 1034. I believe, as he states, there will be a great change in industrial conditions, especially in coal mining. At the present time, everything seems to be at a standstill. There is nothing doing, and many of the miners having large families to support and being obliged to rent their houses face a hard proposition. In some cases they have exhausted their credit at the company's store, and necessity compels them to go elsewhere for work.

In dealing with the strike question, reference has been made to "trouble makers." Much might be added to what already has been said, but it is clear in my mind that coal companies should take every precaution to adopt a system similar to that which is employed in England, where more consideration is given to the miners' actual necessities, and men of large families are assisted in every possible way when times are slack, which establishes a better feeling between the mine officials and the miners generally, and greater harmony prevails.

In closing, I will say that there is probably in every mining camp one or more so-called "leaders." These men no doubt know more than the rank and file of the miners whom they control. They keep posted on market conditions and understand the difficulties and experiences of the company. These leaders, however, are not satisfied unless they are treated a little better than their brother miners. Failing in this, they make every effort to influence the whole camp and arouse the men to make a demand for increase in wages or better conditions in the mines. Unless coal operators are alert to this condition, trouble is sure to follow; but this can often be avoided by suitable tact and prompt action. I heartily endorse the idea of a school for miners where they can learn the English language and become acquainted with coal-trade conditions so that they will better understand when it is necessary for the operator to reduce wages in order to keep the mine in operation.

MINE FOREMAN.

——, Penn.

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Preventing Mine Explosions

Letter 2—Referring to Mr. Riley's letter on this subject, COAL AGE, May 29, p. 938, I believe he has omitted to mention a few precautions that are as important in this connection as those to which he has drawn attention.

I would suggest the following as worthy of careful consideration: 1. The use of permissible explosives wherever these can be employed with satisfaction and advantage. 2. The prohibition of the use of dynamite for blasting coal in mines. 3. The prohibition of the practice common with many miners of mixing different kinds of explosives in the same hole. 4. The use of clay or other incombustible material for tamping.

I fully agree with Mr. Riley in the suggestion that all accumulations of fine coal and dust should be prevented, and, as far as practicable, this should be loaded out in dustproof cars. It is impossible, however, to remove and load out all the fine dust that accumulates on the timbers and waste places in the mine, nor is it possible to load out all the fine coal and dust that accumulates on the haulage roads. For this reason, it is important that the roadways and timbers should be thoroughly sprinkled so as to keep the roads continually in a moist condition. This can be accomplished by a suitable spraying system, by the use of water or steam, or by frequently washing down the timbers, gobs and ribs in all passageways. The spraying system is preferable if the roof conditions existing in the mine will permit of its use.

EDW. H. COXE.

Knoxville. Tenn.

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Study Course in Coal Mining

BY J. T. BEARD

The Coal Age Pocket Book

Atomic Heat—An important relation has been found to exist between the atomic weights of the elements and their specific heats. Dulong and Petit (1819) found that the specific heats (relative heat capacity) of most of the solid elements vary inversely as their atomic weights, so that the product of these two factors is a constant quantity (6.4), which has been properly called the **"atomic heat."** Thus, taking the specific heats of iron, lead and mercury, respectively, as 0.1190, 0.0305 and 0.0333, gives the value for the atomic heat in each case as follows:

	At.Wt.		Sp.Ht.		At.Ht.
Iron,	55.40	×	0.1190	=	6.59 heat units.
Lead,	205.44	×	0.0305	=	6.27 heat units.
Mercury,	198.40	×	0.0333	=	6.61 heat units.

The average value for the atomic heat of the elements may be taken as 6.4, though it is sometimes given as low as 6.25 (Remsen). **Atomic heat** may be briefly defined as the heat capacity of matter per unit-weight atom.

A **gram-atom** of any elementary substance is a weight of that substance, in grams, equal to the atomic weight of the element. Thus, the atomic weight of iron being 55.4 (H = 1), a gram-atom of iron is 55.4 grams of that substance; and its heat capacity is the atomic heat value (6.4 heat units).

This average value of **atomic heat** often assists the determination of the specific heat from the atomic weight of an elementary substance, or, vice versa, its atomic weight when the specific heat is known. For example, since the heat capacity of 55.4 grm. of iron is 6.4 heat units, the average specific heat of iron is $6.4 \div 55.4 = 0.1155$.

In like manner, a **gram-molecule** of any compound substance is a weight of that substance, in grams, equal to the molecular weight of the substance.

Calculation of Density—The elements form the basis of all relative measurements with respect to volume, density and weight. For example, the density of air, referred to hydrogen as unity (H = 1), can be calculated from the relative weights and volumes of oxygen and nitrogen, which are the chief constituents of air. The composition of pure air, by volume, is practically, oxygen (O) 20.9 per cent., nitrogen (N), 79.1 per cent. Then, since the atomic weight of oxygen is 16 and that of nitrogen 14, the relative weight of 100 volumes of air, referred to hydrogen as unity, is found as follows:

Oxygen, $20.9 \times 16 = 334.4$
Nitrogen, $79.1 \times 14 = 1107.4$
Air, 100 vol's $= 1441.8$

Therefore, one volume of air is $1441.8 \div 100 = 14.418$ times as heavy as the same volume of hydrogen; or, the density of air referred to hydrogen is 14.418.

The percentage composition of pure air, by weight, is readily calculated from the above figures; thus:

Oxygen, $\frac{334.4 \times 100}{1441.8}$ = say 23.2 per cent.

Nitrogen, $\frac{1107.4 \times 100}{1441.8}$ = say 76.8 per cent.

The Coal Age Pocket Book

Transmission of Heat—The condition known as "heat" is transmitted in any one of the three following ways: 1. By **radiation.** 2. By **conduction.** 3. By **convection.**

Heat is radiated in straight lines in all directions from its source and is then called "radiant heat." It is transmitted through the vibrations of the ether that fills all space and the radiated heat is imparted in varying degree to all matter in its path. Heat so imparted to a body is said to be "absorbed" by the body.

When heat travels through a body the process of transmission is known as "conduction." Heat thus spreads throughout the **mass of a solid.**

The spread of heat **in any fluid** (liquid or gas) is through the circulation caused by the unequal distribution of the heat. This mode of transmission is known as "convection."

Measurement of Heat—Although heat, as already explained, is a **condition of matter** and not a tangible quantity, it is possible to measure its intensity or degree through the effect it produces, referred to certain established **standards of measurement.** The most convenient standard is the heat energy that will cause a rise of one degree in the temperature of a unit weight of pure distilled water at its point of maximum density. This is called a "heat unit" or "thermal unit" and is a quantity capable of exact measurement.

Heat or Thermal Units—There are several heat units in common use, the principal ones being the British unit and the French unit. A third unit that is largely used combines these two units.

The British Thermal Unit—The British thermal unit (B.t.u.) is the quantity of heat required to raise the temperature of 1 lb. of pure distilled water at maximum density, 1 deg. of the Fahrenheit scale.

The French Thermal Unit or Calorie—This is the quantity of heat required to raise the temperature of 1 kg. of pure distilled water at maximum density, 1 deg. of the Centigrade scale.

The Pound Calorie—This is the quantity of heat required to raise the temperature of 1 lb. of pure distilled water, at maximum density, 1 deg. of the Centigrade scale.

Conversion Formulas—

B.t.u.	×	0.252	=	Calories
B.t.u.	×	5/9	=	Pound-calories
Calories	×	3.968	=	B.t.u.
Calories	×	2.2046	=	Pound-calories
Pound-calories	×	9/5	=	B.t.u.
Pound-calories	×	0.4536	=	Calories

Note—Since 1 lb. (avoirdupois) = 0.4536 kg.; and
1 deg. (Fahr.) = 5/9 deg. (Cent.),
1 B.t.u. = $0.4536 \times 5/9 = 0.252$ cal.
Again, since 1 kilogram = 2.2046 lb. (avoir.); and
1 deg. (Cent.) = 9/5 deg. (Fahr.),
1 cal. = $2.2046 \times 9/5 = 3.968$ B.t.u.

These simple calculations show the derivation of the constants used in the above formulas.

Inquiries of General Interest

Rail vs. Water Freights to the Pacific Coast

Some time in the near future the coal operators in the Middle West will have a chance to suggest to the railroads the advisability of their making a reduction in freight rates from Wyoming and Utah points to the Pacific Coast, so as to enable the coal here to compete with shipments of coal on the Atlantic Coast now passing through the canal and destined for Pacific Coast points.

From this inland locality it is very hard to obtain authentic information in regard to the shipping of coal by water, and it has occurred to me that COAL AGE might furnish the coal operators in this section with some general information in regard to the cost of shipping coal through the canal that would be of value in the solution of this problem. Any information you can give that will assist us in obtaining an equable adjustment of this important matter will be greatly appreciated.

H. C. MARCHANT,
Sales Manager, Lion Coal Co.

Ogden, Utah.

[Since the opening of the canal the problem presented in the above inquiry has been of growing importance to shippers throughout the Central Basin and Rocky Mountain Districts. The next issue of COAL AGE will contain Letter No. 1, discussing the important features involved. Let others follow.—EDITOR.]

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Coal Seams in Indiana

Can you inform me how many workable coal seams there are in the State of Indiana, giving the names of the different seams?

J. MCMILLAN.

Clinton, Ind.

The workable seams of coal in Indiana vary, in the different counties of the state, from 2 to 18 in number and from 2 ft. 8 in. to 10 ft. 2 in. in thickness. A chart of the Indiana coalfield, prepared by Edwin F. Lines, shows a vertical section through the coal measures. The various coal beds or seams in this section are numbered from the bottom upward as Coal 1, 2, 3, 3a, 4, 4a, 5, 5a, 6, 7 and 8. These practically include all the workable seams in the state. The two lowermost of these divisions, however, are subdivided and described as Cannelton, Lower Block, Upper Block and Minshall coal. The uppermost division of the measures (Coal 8) is not workable.

To summarize these remarks, it may be stated that there are practically nine workable seams in the state; namely, counting from the bottom of the measures, the Cannelton, Lower Block, Upper Block, Minshall and seams 3, 4, 5, 6 and 7 previously mentioned. The celebrated block coal of Indiana predominates in Clay County; the Minshall coal is worked principally in Clay, Daviess, Parke and Fountain Counties. The Upper and Lower Block seams vary from 3½ to 4½ ft. in thickness, while the Cannelton coal has an average thickness of 3 ft. and the Minshall coal varies from 3 ft. to 5 ft. 6 in.

The table gives some interesting data in regard to Indiana coal seams and their estimated tonnage:

TABLE SHOWING THICKNESS AND EXTENT OF COAL SEAMS AND DISTRIBUTION BY COUNTIES

County	Number of Seams	Maximum Thickness of Single Seams		Maximum Total Thickness of Seams		Maximum Total Thickness Workable		Total Coal Area	Workable Coal Area	Estimated Total Tounage of Coal	Estimated Tonnage Removed or Unworkable	Estimated Tonnage Available
		Ft.	In.	Ft.	In.	Ft.	In.	Sq. Mi.	Sq. Mi.	Million Tons	Million Tons	Million Tons
Clay	16	9	0	27	0	19	0	250	100	1200	70	300
Crawford	3	4	0	4	0	2	6	12	..	10	0.15	0.4
Daviess	15	7	3	27	0	19	0	400	200	2500	7	400
Dubois	9	5	0	17	0	12	0	300	40	1000	0.1	50
Fountain	7	8	0	15	0	9	0	325	75	500	3	150
Gibson	15	7	7	20	0	13	0	450	400	6000	2	1000
Greene	14	7	0	45	0	35	0	300	200	1000	40	400
Knox	15	9	10	36	0	23	0	540	300	8000	3000	2000
Martin	7	4	0	12	0	7	0	175	14	500	0.5	20
Orange	2	2	8	4	0	2	6	1	..	1	..	0.2
Owen	4	6	1	10	0	8	0	125	30	67	0.7	15
Parke	11	7	6	35	0	24	0	470	100	1000	30	435
Perry	7	5	8	8	0	3	0	30	6	36	3.5	9
Pike	13	10	2	20	0	13	0	330	200	2000	20	650
Posey	11	6	0	25	0	17	0	420	200	2000	..	500
Putnam	2	3	0	5	0	5	0	100	1	50	0.4	2
Spencer	11	5	10	20	0	13	0	300	24	1000	0.3	50
Sullivan	18	9	0	40	..	28	0	440	365	10,000	50	4000
Vanderburgh	10	4	6	18	0	12	0	240	200	2000	25	1000
Vermillion	12	7	0	35	0	22	0	250	200	1500	30	600
Vigo	18	7	6	43	0	33	0	400	300	4000	50	1500
Warren	4	4	2	9	0	7	0	300	30	500	0.6	50
Warrick	12	9	0	25	0	19	0	356	175	2000	10	500

The seams attaining a thickness of 6 ft. and over in the state are as follows: Seam, 3, having a thickness of 7 ft. 6 in. in Greene, 7 ft. 4 in. in Vigo, 7 ft. in Clay and 6 ft. 6 in. in Sullivan Counties; seam 5, having a thickness of 8 ft. in Clay, 7 ft. in Pike, Knox and Warrick Counties, 6 ft. 10 in. in Sullivan and Gibson Counties and 6 ft. in Greene and Daviess Counties; seam 6, having a thickness of 6 ft. 6 in. in Sullivan; and seam 7, having a thickness of 6 ft. in Vigo County.

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Sampling Coke

What are the important points in the sampling of a consignment of coke for the purpose of determining its fuel value for power purposes, and how does the sampling of coke differ from that of coal?

FUEL INSPECTOR.

Chicago, Ill.

The quality of coke is much more uniform than that of coal, owing to the process of crushing and mixing the coal before coking. A smaller sample of coke is therefore required. The appearance of the coke, unlike coal, furnishes no index of its quality in respect to the percentage of ash, sulphur or phosphorus, which must be determined in the laboratory. The bright silvery luster and the dark discoloration are alike the results of the burning. It is well, however, to select as samples the long slim pieces as better representing the oven charge from top to bottom.

Examination Questions

Montana Mine Foremen's and Firebosses' Examination Held at Red Lodge June 8-10, 1915

(*Selected Questions*)

Ques.—If 13 cu.ft. of air, at ordinary temperature and pressure, weighs 1 lb., how many tons of air are passing through a mine in 8 hr., where the current measures 52,000 cu.ft. per min.?

Ans.—Assuming that the temperature and pressure in the mine are the "ordinary temperature and pressure" mentioned in the question and that the mine air weighs 1 lb. for each 13 cu.ft., the weight of air passing through the mine in 8 hr. is

$$\frac{52,000}{13} \times \frac{1}{2000} \times 8 \times 60 = 960 \textit{ tons}$$

Ques.—Where are gases found in mines, and how are they produced?

Ans.—The common mine gases occur in largest quantity, in a properly ventilated mine, at or near the points where they are generated; but in a poorly ventilated mine these gases may accumulate in considerable quantities in void or abandoned places where they have found their way, or at the face of rise or dip workings where they accumulate by virtue of their densities. Those gases *lighter* than air find their way naturally to the rise workings and cavities in the roof or above the falls, while those *heavier* than air gradually sink to the floor and other low places in the mine, such as swamps and dip workings. The hydrocarbon gases, as methane, olefiant gas to some extent, and ethane, which is frequently associated with methane, are confined in the natural strata known as the "coal formations" and issue from the strata into the mine workings.

Carbon dioxide is produced in the complete combustion of coal and other carbonaceous matter in the mine. These forms of combustion are continually occurring in the breathing of men and animals, burning of lamps and the slow combustion of fine coal and slack in the waste places of the mine.

Carbon monoxide is produced largely by the explosion of powder and the combustion of carbonaceous matter in a limited supply of air.

Sulphureted hydrogen, when found in mines, is usually the result of the action of water on pyrites (FeS_2) so often associated with the coal.

Ques.—How are gases caused to expand out of the strata and at times to overflow the workings of a mine?

Ans.—The gases occluded in the coal formations exist there under more or less pressure. It may not be thoroughly understood what actual causes produce the outflow of these gases from the strata. Undoubtedly, the pressure under which the gases are occluded plays an important part in their emission. It is probable, also, that the diffusive action known as "osmose" by which gases pass into each other through a porous medium, plays an important part in the escape of the occluded gas through the pores of the coal.

What is known as an "outburst" of gas from the strata is the result of the accumulation of occluded gas in crevices and other void places in the strata, under great pressure. This pressure is thus distributed over a considerable area and is often sufficiently great to break down the coal at the face of the workings or to heave the floor of the mine or cause a heavy fall or roof, according as the gas is confined in the underlying or overlying strata of the seam. At other times, such accumulations of gas in the strata find their way into the workings through a crevice or drillhole, and this is known as a "feeder" of gas or "gas feeder."

Ques.—What is firedamp?

Ans.—The term "firedamp," in this country, is applied to any inflammable or explosive mixture of methane and air, with or without other gases. A simple mixture of methane and air, in proportions that are not inflammable or explosive, cannot properly be termed firedamp, although the term is often taken to mean *any* mixture of methane and air.

Ques.—What percentage of firedamp is most dangerous?

Ans.—When the proportion of air to gas is such that the mixture is above the maximum explosive point, the danger is greater than when the proportion of gas is less than what marks this point. The reason is that when a larger proportion of gas is present any addition of air, which is liable to occur in the mine at any time, will render the firedamp mixture more explosive. In other words, the addition of fresh air to a firedamp mixture *above* the maximum explosive point will increase the explosiveness of the mixture until that point is reached, after which the further addition of air will decrease its explosive condition.

Ques.—What effect would carbon dioxide (CO_2) have on marsh gas (CH_4) when these are mixed together?

Ans.—The mixture of carbon dioxide with marsh gas will have no effect on the gas itself; but when carbon dioxide is added to a mixture of marsh gas and air (firedamp) the effect is to reduce the explosive condition of the mixture. It is estimated that when a firedamp mixture is at its most explosive point, the addition of one-seventh of its volume of carbon dioxide will render the firedamp inexplosive.

Ques.—A current of 3000 cu.ft. of air and gas is at the explosive point. How much fresh air must be added to prevent a cap?

Ans.—Assuming the question refers to the *maximum explosive point,* the quantity of gas in this current is $3000 \times 0.0946 = 283.8$ cu.ft. per min. Now, assuming a flame cap first appears when 2 per cent. of gas is present, the total circulation is $283.8 \div 0.02 = 14,190$ cu.ft. per min. The required addition of air is then $14,190 - 3000 = 11,190$ cu.ft. per min.

Coal and Coke News

Washington, D. C.

The text of the decision of the Supreme Court of the United States in the so-called Commodity Clause case affecting the Delaware, Lackawanna & Western R.R. and its affiliated coal concern, has been made available within the past few days and apparently brings one phase of the litigation in question to a definite conclusion. (No. 517, October term, 1914; U. S. appellant vs. D., L. & W. Ry. Co., and D., L. & W. Coal Co.) The case is moreover of special interest because of the conflicting decisions that have heretofore been rendered with reference to the working of the so-called Commodity Clause in the Interstate Commerce Act, under which it was made unlawful for a railroad company to carry on any business not connected with transportation, and thus makes a detailed review of the case worth while at this time.

The act of 1906 made it unlawful for carriers to haul their own coal beyond the limits of the state in which they were located; and, desiring to continue the business of mining and transporting coal, the Delaware, Lackawanna & Western R.R. Co. adopted a plan under which it was to make a sale and divest itself of title to the coal, at the mouth of the mines, before transportation began.

Accordingly it caused to be incorporated, under the laws of New Jersey, the Delaware, Lackawanna & Western Coal Co. with a capital stock of $6,800,000,—divided into shares of $50 each. The railroad company then invited its own stockholders to subscribe to the capital stock of the coal company at the rate of one share of the latter for each four shares of the former. Ninety-nine per cent. of these stockholders did, as was expected, subscribe for the stock of the coal company—their subscriptions being paid for in full out of a cash dividend of $13,600,000 previously declared by the railroad company.

The new corporation was then organized by electing the vice-president of the railroad company as president of the coal company, while other officers and directors of the coal company were also officers and directors of the railroad company.

As soon as the organization was completed, the railroad company prepared and submitted to the coal company a contract by which the railroad company, reserving what it needed for its railway locomotives, "agreed to sell and the coal company agreed to buy, f.o.b. the mines, all coal which, during the term of the contract, the railroad company should produce from its own mines or purchase from any one else." The price for prepared sizes—the more important commercial coal—was fixed at 65 per cent. of the price in New York on the day of delivery at the mines. The railroad company also leased to the coal company all its trestles, docks and shipping facilities.

Both Companies Signed Contract

The contract—thus prepared by the railroad company—was then signed by both corporations and, on Aug. 2, 1909, the coal company took possession of the leased property; those who had been agents of the railroad in its sales department became agents of the coal company in its sales department, and the two corporations, with managing officers in common, also had offices in common in the City of New York.

Thereafter the railroad company continued its mining business, annually producing about 7,000,000 tons and purchasing about 1,500,000 tons from operators whose mines were located on its railway. After retaining what was needed for use on its railway engines, it sold the balance, aggregating about 7,000,000 tons, to the coal company at the contract prices, f.o.b. the mines. The coal thus sold by the railroad company was then transported by it to destination where it was delivered to the coal company which paid the regular tariff freight rate and the contract price on the 20th of each month. This course of dealing continued until February, 1913, when the Government filed a petition, against both corporations, alleging that the two were practically one, and attacking the validity of the contract.

This particular case was appealed from the District Court of the United States for the District of New Jersey, where the decision has gone against the contention of the United States that such an arrangement as has thus been set forth was out of harmony with the provisions of the law. The decision of the court was based upon the view that the essential object of the commodity clause was to prevent railroads from occupying the dual and inconsistent position of public carriers and private shippers, and that it must be broadly interpreted in its application to the operations of the company with a view to finding out whether given practices are or are not inconsistent with the attainment of such an object.

Without going into the technical legal analysis of the various aspects of the contract between the railroad company and the coal company, it is worth while to note the position taken by the two companies in general terms.

The Contract Carried Unusual Provisions

The most cursory examination of the contract shows that—while it provides for the sale of coal before transportation begins—it is coupled with onerous and unusual provisions which make it difficult to determine the exact legal character of the agreement. If it amounted to a sales agency the transportation was illegal because the railroad company could not haul coal which it was to sell in its own name or through an agent. If the contract was in restraint of trade it was void because in violation of the Sherman Anti-Trust Law. The validity of the contract cannot be determined by consideration of the single fact that it did provide for a sale. It must be considered as a whole and in the light of the fact that the sale at the mine was but one link in the business of a railroad engaged in buying, mining, selling and transporting coal.

The court further finds that the provision in the contract whereby the railroad was able to dictate to whom the coal should be sold even at unprofitable prices, was also objectionable from the standpoint of the law, while various other elements contained in it practically made it an instrument of monopoly. The contract, therefore, violated not only the commodity clause of the Interstate Commerce Act, but also the Sherman Anti-Trust Law in the consequent conclusion.

Particularly in its application to the railroad business, the decision makes clear that such a company if it continues in the business of mining, must absolutely dissociate itself from the coal before the transportation begins. It cannot retain the title nor can it sell through an agent. It cannot call that agent a buyer while so hampering and restricting such alleged buyer as to make him a puppet subject to the control of the railroad company.

If the railroad sells coal at the mouth of the mines to one buyer or to many, it must not only part with all interest direct or indirect in the property, but also with all control over it or over those to whom the coal is sold at the mines. It must leave the buyer as free as any other buyer who pays for what he has bought.

It should not sell to a corporation with officers and offices in common—for the policy of the statute requires that instead of being managed by the same officers, they should studiously and in good faith avoid anything, either in contract or conduct, that remotely savors of joint action, joint interest or the dominance of one company by the other. If the seller wishes—by a lawful and bona fide contract, whose provisions as to delivery and otherwise are not in restraint of trade—to sell all of its coal to one buying company, then that one buyer can be bound by reasonable terms and required to pay according to the contract.

PENNSYLVANIA

Anthracite

Pottsville—Evidently the officials of the United Mine Workers of America are beginning a campaign to instill enthusiasm in the miners of the anthracite region in anticipation of the new agreement which it is expected will be entered into at the expiration of the present arrangement on Mar. 31, 1916. Announcement has just been made that John P White, president, will visit the Panther Creek Valley during July and deliver addresses in various mining towns and communities.

Shenandoah—William Singmaster, aged 34 years, was killed, and Michael Heiser, Edward Ressinger and Charles Slaterbach, so seriously burned that their recovery is doubtful, by a gas explosion in the Potts Colliery. The material damage to the mine was also considerable, as the force of the explosion was great, tearing out the mine props and roof supports.

Wilkes-Barre—The Anthracite Conciliation Board has been taking testimony here on an appeal made by the United Mine Workers employed at Hazleton in the operations of the Lehigh Valley Coal Co. and Cox Brothers. The miners state that union pumpmen and firemen have been suspended due to short working time and their places taken by monthly salaried employees, such as bosses, foremen and clerks. Decision has been reserved.

Bituminous

Waynesburg—There will be offered for sale in front of the Greene County courthouse on Saturday, July 15, at an administratrix' sale, 186.17 acres of land, together with all mining privileges without restrictions as to the support of the surface. The land is located in Franklin Township, Greene County, Pennsylvania.

Uniontown—Orders to fire 770 more ovens of the H. C. Frick Coke Co. have been issued. The plants affected are: Wynn, 170, after a year's idleness; Bridgeport, 100, idle for about 8 months; Lemont No. 1, 160, idle for almost a year; Brinkerton, Buffington, Colonial No. 1, Continental No. 1, Edenborn, Hecla, Lambert, Leisenring Nos. 1, 2 and 3, Leith, Redstone, York Run, Youngstown, Hostetter, Whitney and Trotter. The latest order places Continental No. 1 and Leith on a capacity basis.

Marianna—Resident Manager Harris Booker of the Marianna mine of the Pittsburgh Buffalo Coal Co. has issued a call for hands to resume operations in this mine. Between 200 and 300 men will be employed. The mine reopened June 21 and prospects are bright for steady work. Good houses are located at the mine and these will all be rented to the men that secure work.

Johnstown—An abandoned mine probably more than 100 years old, in which timbers covered with water are becoming petrified, has been discovered, it is said, by Thomas Leahey, a well-known coal operator, in opening a small private mine on his property at Cassandra. The oldest residents of this section cannot recall such a mine and it is believed that it was opened before the days of the Old Portage. The heading is said to extend about 500 ft. The surface of the coal indicates that picks were used and that no dynamite or powder was employed. Heavy square timbers were used such as are now employed for lagging a drift. The timber, because of the fact that the mouth of the mine has been closed up and the air shut off, has become so hard that it turns the edge of an axe. Inside the mine was a small mine car that would hold about four bushels of coal. The car is of wood and has wooden wheels. The tires were made of strap iron nailed to the wheels. There were no tracks but heavy planks were doubtless used to guide the car which was probably pushed by hand.

Simpson Station—The Union-Connellsville Coke Co. has fired 100 ovens at its Katherine works at Simpson Station, about three miles above Brownsville, on the Monongahela railroad. The plant has been idle since Jan. 14, 1914. Within the next month the company expects to have the entire plant fired in full, with the expectation of steady work for a long time. It has secured a big contract.

Connellsville—Shipments of coke from the Connellsville region recently rose to 351,000 tons per week, with production at 348,000 tons, thus establishing a new high record for the year. Compared with the previous week this showed an increase in shipments of 19,000 tons. More ovens are constantly being put in service throughout the Connellsville region.

VIRGINIA

Raven—The Raven Red Ash Coal Co., located at Raven, on the Clinch Valley branch of the Norfolk & Western R.R., is installing a coal washer to wash its slack. This firm is mining the Lower Banner seam of coal, which carries a soft fire clay or draw slate above it. This comes down and breaks up, mixing with the coal, making it necessary to wash the slack in order to clean this product.

WEST VIRGINIA

Dubree—The Rothwell Coal Co. is opening a new mine on the north side of the creek about half a mile from the old one. A bed of coal over 4 ft. in thickness has been opened and there is every prospect that the operation will be a profitable one. Fifteen hundred feet of railroad is being built to the new mine.

Ethel—Six hundred miners are working in the operations of the Logan Mining Co. and the Ethel Coal Co. at the present time, which is a larger force than has been at work for more than a year. It is believed that the present boom is the beginning of a revival which will be of considerable extent. During the past year only about 200 miners have been employed at Ethel, and these in many instances were working only part time.

Williamson—On Saturday, July 10, at 10 o'clock a.m., at the front door of the Mingo County Court House, the plant and equipment of the Mingo Washed Coal Co., consisting of a lease for coal-mining purposes containing 588⅔ acres, situated at Ajax Siding in Hardee District, Mingo County, with 13 miners' houses, one bungalow, a clubhouse, store and office building, also powder house, washer, tipple and a considerable amount of machinery, such as engines, generator, switchboard, boilers, pumps, a coal washer with machinery installed, coal-cutting machines, etc., will be offered for sale at public auction. Full information may be secured on request from M. T. Persinger, trustee of the estate of the Mingo Washed Coal Co.

KENTUCKY

Hazard—The Harvey Coal Co. headquarters, Knoxville, Tenn., announces that it will be ready to begin shipping coal from the First Creek territory within the next 30 days. Already mining work is well under way.

Jenkins—The Consolidation Coal Co. announces increases in its Jenkins-McRoberts plants, owing to recent big orders aggregating several hundred thousand tons. The Elk Horn Mining Corporation in the Fleming field also has some good orders. Several hundred additional miners have gone to work in both plants.

Central City—Additional resolutions, condemning violence, which has been more or less prevalent in Ohio County, were adopted by farmers and miners assembled at a mass meeting near Williams' mines in Ohio County recently. Robert Pollock, president of District No. 23, United Mine Workers of America, presided, stating that the object of the meeting was to demonstrate to the public that the union men were against lawlessness. He read a resolution which had been prepared condenmning the outrages and pledging the miners and farmers to law and order.

OHIO

Stewartsville—The Franklin Coal Co. mine recently resumed operation with a small force of men. It will be several weeks before the company has all its employees busy, but when running full time this mine employs 200 men.

Shadyside—James and Patrick Cook, of Fairmont, W. Va., are making repairs to the Wegee mine, south of Shadyside. This mine has not been operated for three years and is in a bad condition. The old tipple and some of the other buildings have been taken down, and it will probably take some months to rebuild the plant and clean up the mine.

Warsaw—The Ohio Cannel Coal Co. has opened its mines near Warsaw after an idleness of more than two months.

Columbus—So far no legal action has been taken against the Piney Fork Coal Co. of Columbus, which is preparing to open a stripping operation in Jefferson County, Ohio. A newspaper in Steubenville is aroused over the project and is urging the county officials to stop the work by means of an injunction. It is apparently working for the miners' organization. J. W. Blower, of the company, does not anticipate any trouble. He is working to get things in shape for the delivery of the huge steam shovel some time in July.

INDIANA

Boonville—The Center Mining and Coöperative Association recently organized by the Hackett Mining Co., has started operation of the Hackett mines, with 50 operatives. The directors of the corporation are Robert Madden, Fred Geyer, Charles Wilder, Roscoe Scott and Bert Pursinger.

Evansville—The Supeiror Court here declined to appoint a receiver for the Vanderburg County Mining Co., as petitioned.

Princeton—A strike of 300 miners at the Princeton mine ended when the company returned to the old method of loading the men into the cage. The company had tried the chute plan, which, it asserted, was safer, but the employees held that it was more dangerous and in addition, contrary to law.

Kokomo—William F. Smith, representing the Inland Coal Co., has purchased the Domestic Block Coal Co.'s mines near Brazil, Ind., from the receiver, for $5000, the creditors' claims being $10,000.

ILLINOIS

New Baden—Engineers of the Southern Coal and Mining Co., in drilling for water, with the hope also of striking oil, at the Little Oak Mine, west of here, found three veins of good coal, one at a depth of 115 ft., the second at a depth of 210 ft. and the third at a depth of 314 ft. The upper vein was 6 ft. in thickness. The two lower beds were only 3 ft. in thickness but the coal was of excellent quality. This is the first time that three coal measures have been found in this section. No oil was struck, although a well was bored to the depth of 746 ft. The primary purpose of obtaining a good supply of water was accomplished.

Belleville—A case of great importance to coal operators, originating here, has just been decided by the United States Supreme Court, which declares it is the duty of a railroad to supply cars when ordered by an operator for the transportation of coal and holds the railroad company liable for damages incurred by the operator through the failure of the railroad company to provide cars. The suit was brought in the St. Clair County Court at Belleville by the Mulberry Coal Co., of Freeburg, against the Illinois Central R.R. Co. to recover damages for the failure of the railroad to furnish cars to the company's mine, located near the road, pursuant to the demands of the mining company. It was based on the failure of the railroad company to furnish cars to the mine on certain days in 1907. A jury in the Circuit Court gave a verdict in favor of the mining company for $716.92. The railroad carried the case to the Illinois Supreme Court, which affirmed the decision of the Circuit Court, and then to the United States Supreme Court, which has now also decided in favor of the mining company. The decision by the highest court of the land that railroads must furnish cars when asked or pay damages is regarded by mining men as one of the greatest victories ever gained. Attorney A. B. Ogle, of Belleville, who with attorneys William Winkelmann and James O. Miller, presented the mining company's side of the case to the Supreme Court, says nation-wide interest has been manifested in the outcome. He has had inquiries concerning the case from Pennsylvania, Kentucky and other mining states.

Pana—Because the mine of the Pana Coal Co., one of the oldest and largest in the state, constructed at an original cost of more than $200,000, brought only $30,000 at a master's foreclosure sale recently, which was insufficient to pay the fees and certificates of the receivers, Judge McBride, in the Circuit Court, set aside the sale and ordered a readvertising and sale of the property.

PERSONALS

Edward Page was recently elected vice-president of the New England Coal & Coke Co. at a meeting of the directors.

John K. Oliphant, president of the Oliphant-Wasson Coal Co., recently purchased the old site of the First National Bank in Vincennes, Ind., where he will erect an eight-story office building.

David A. Thomas, the Welsh coal magnate, was recently appointed by David Lloyd George minister of munitions, to go to the United States to supervise the making of munition contracts in this country and Canada.

W. H. Glasgow, for many years assistant to the general superintendent of the H. C. Frick Coke Co., has been appointed assistant general superintendent. This position was held for some years by Clay F. Lynch prior to his taking charge of the Bunsen Coal Co.'s operations seven years ago.

J. H. Wood, who has been western sales manager of the Davis Colliery Co., with headquarters in Columbus for the past two years will leave July 1 to be succeeded by Maury Robinson, formerly in charge of the local office. Mr. Robinson is the son of Neil Robinson, a well-known coal man of West Virginia.

J. L. Rogers, general manager of the Lamb Coal Co. for the West Virginia capitalists who recently purchased the property, will assume the duties of the office when he relinquishes management of the Muhlenberg County Savings Bank to the First National Bank which has absorbed it. J. C. Saunders, of Premier, W. Va., is president of the new company.

Col. Richard Coulter was recently elected president of the Keystone Coal & Coke Co. to succeed the late Col. L. B. Huff. Colonel Coulter has been connected with the company as vice-president for several years. Julian B. Huff, of Greensburg, and Robert K. Cassatt, of Philadelphia, were elected vice-presidents of the company at the same meeting of the directors.

Rodman Wanamaker, who has for many years been actively associated with the mercantile interests of his father, John Wanamaker, has been elected to the board of the Lehigh Coal & Navigation Co. In addition to his activities as a merchant he is closely connected in financial circles, being at this time vice-president and a director in the West End Trust Co. and a director in the First Penny Savings Bank, of which John Wanamaker is president.

T. J. Mitchell, general manager of the Allegheny Coke Co. on returning to his home in Uniontown, Penn., announced that this firm's plant in Pike County, Kentucky, would resume operations on July 1 after an idleness of six months. One hundred and fifty rectangular ovens will be fired the first of the month to fill an order for 10,000 tons per month. The coke manufactured by the Allegheny Coke Co. is similar to Connellsville coke and the prices are about the same.

H. B. Dunham, who has been connected with the traffic department of the Hocking Valley Ry. Co. for 23 years retires from active work July 1 to be succeeded by H. Q. Wasson, who has been his assistant. Mr. Dunham does not resign but is retained in an advisory capacity. The position of traffic manager is abolished and Mr. Wasson will report directly to M. J. Caples, vice-president. Mr. Dunham is one of the best known traffic men in the country. Ill health is the reason for his retirement.

OBITUARY

John W. Moyer, a retired contract miner, died in Shenandoah, Penn., on June 25. He was 74 years old. During the early 60's Mr. Moyer took a prominent part in the development of some of the largest operations in the Schuylkill District.

Mine Foreman J. B. Kirkpatrick, of Johnstown, Penn., was instantly killed recently when he went to the rescue of a miner who had grasped a live electric wire. Kirkpatrick received the full force of the current through the body of Lotsi Solders, the miner, who was only slightly burned.

John H. Ross, superintendent of the Superior Coal Co. at Gillespie, Ill., died at his residence on June 23, at the age of 36 years. Funeral services took place from the residence under the auspices of the Masonic Lodge and at the Lutheran Church under the direction of Rev. L. Krekler. Interment was made at Gillespie Cemetery.

PUBLICATIONS RECEIVED

Department of the Interior, Bureau of Mines, Technical paper 88. "The Radium-Uranium Ratio in Carnotites," by S. C. Lind and C. S. Whittemore. Twenty-nine pages, 6x9 in., illustrated.

Dept. of the Interior, Bureau of Mines. "Mining and Milling of Lead and Zinc Ores in the Wisconsin District, Wisconsin," by Clarence A. Wright. Thirty-nine pages, 6x9 in., illustrated.

Department of the Interior, Bureau of Mines. "Monthly Statement of Coal Mine Fatalities in the United States, March, 1915," compiled by Albert H. Fay. Twelve pages, 6x9 in., unillustrated.

The Topographic and Geologic Survey of Pennsylvania, Report No. 8, E. "The Mineral Production of Pennsylvania in 1911." Richard R. Hice, State Geologist. Eighty-four pages, 6x9 in., unillustrated.

Illinois Coal Mining Investigation, State Geological Survey, Dept. of Mining Engineering, University of Illinois. Bulletin No. 12. "Coal mining practice in District IV," by S. O. Andros. Fifty-seven pages, 6x9 in., illustrated.

Department of the Interior, Bureau of Mines, Technical Paper 101. "Permissible Explosion Proof Electric Motors for Mines; Conditions and Requirements for Test and Approval," by H. C. Clark, illustrated, 17 pages, 6x9 in.

INDUSTRIAL NEWS

Philadelphia, Penn.—On Sunday, June 20, the steamer "City of Taunton" ran into and sunk the coal barge "Solace," The loaded barge was at anchor when struck by the steamer. Fortunately the "City of Taunton" was enabled to rescue all of the crew.

Philadelphia, Penn.—Private advices received here give the information that the British steamer "St. Joseph," which left here with a cargo of coal a few days ago, caught fire at sea. The fire started in the cargo, but fortunately was confined to two of the holds and the vessel was not damaged.

Columbus, Ohio—All of the sales force of the Sunday Creek Coal Co., in charge of P. A. Coen, general sales manager and George F. Schwartz, assistant, inspected the San Toy and Congo mines of the company, following their attendance at the annual meeting of the Michigan-Ohio-Indian Coal Association.

Pittsburgh, Penn.—Shipments of coal and coke over the Pennsylvania R.R. east of Pittsburgh and Erie for the month of May amounted to 5,238,504 tons, an increase of 90,838 tons compared with the corresponding month of last year. From Jan. 1 to May 31, the shipments totaled 25,185,931 tons, or a decrease of 2,227,749 tons in comparison with a corresponding period of 1914.

Winchester, Ky.—Steel rails for the branch coal road up First Creek from the Lexington & Eastern Branch of the L & N. are being laid and construction is progressing. Two negroes owners of a tract near Hazard, have sold it for $60,000. Two years ago the same land could have been purchased for $5 an acre. A syndicate headed by C. G. Bowman made the purchase.

Philadelphia, Penn.—A prominent financial house has compiled figures bearing on the amount of money sent out of the country by foreign mine workers in the anthracite region. This statement shows that for the six months following the declaration of war the alien workers have been prevented from sending $10,000,000 as compared with the amount sent during the six months prior to the start of the European conflict.

Camden, N. J. — The New York Shipbuilding Co. is now building on account of West Virginia coal interests two 9000 ton steamers for the export coal trade to Mediterranean ports. The boats will be managed by the Crowley firm of Boston and will be of the same type as the colliers "Lingan" and "Hochelaga," built, in England, especially for the St. Lawrence coal trade. These boats have machinery amidships but are not self-trimmers.

Brilliant, Ohio—The property of the Dexter Coal Mining Co., located at Brilliant, Ohio, is to be sold at 1 p.m., July 30, upon the order of Judge Sater in the federal court. The court set $15,000 as the lowest price to be accepted. J. C. Ault is receiver for the Dexter Coal Mining Co. and will conduct the sale. The sale of the property was ordered at the instance of the Pittsburg-Buffalo Coal Co., which is named as plaintiff in the proceedings.

Ensley, Ala.—It has been announced by officials of the Tennessee Coal, Iron & R.R. Co. that No. 5 Blast Furnace at Ensley is being prepared to be put in operation within a short period. When this furnace goes into blast all six of the big iron makers at Ensley will be in operation for the first time in many months. It is felt throughout this region that the greatest industrial section in the South is once more falling into the active stride which has made it a centre of prosperity during past years.

Washington, D. C.—The United States Supreme Court has not yet entered the final order compelling the actual separation of the coal properties of the Delaware, Lackawanna & Western R.R. Co. from the railroad proper. The Lackawanna officials consequently have not yet learned when they must reorganize to meet the dictates of the commodity clause of the Hepburn Act. Until this order is entered the Lackawanna will not state its plans for the future as regards the coal-distributing business.

Washington, D. C.—A long and short haul order was recently entered by the Interstate Commerce Commission benefiting the New York Central R.R. in the matter of bituminous and cannel coal from Pennsylvania mines to Rhode Island points. The Commission granted the application of the New York Central R.R. and announced that the road may establish a rate of $2.45 per ton of 2240 lb. on bituminous and cannel coal in car loads from Pennsylvania mines to Olneyville, Providence and Auburn, R. I.

Chicago, Ill.—The petition of the Consolidated Indiana Coal Co. and the Monon Coal Co. to the Interstate Commerce Commission to equalize the rate from the Sullivan-Linton coal fields to Chicago with that in effect from the Brazil-Clinton group—a difference of 10c. per ton existing—was refused in a recent decision rendered by the Commission. This decision is a great disappointment to the Sullivan-Linton operators, who had hoped to be placed in an equal position with the Clinton shippers in selling their coal in the Chicago market.

Cincinnati, Ohio—The Ohio River Board of Engineers met in the office of United States Division Engineer Colonel Henry Jervey recently for the purpose of preparing an estimate of the amount of money which will be needed during the fiscal year, ending June 30, 1917, for Ohio River improvements. The estimate will be forwarded to the Chief of Engineers at Washington for presentation to the next Congress. The amount necesary for continuing the improvement of the river by lock and dams and for general river improvement, etc., will probably approximate $10,000,000.

St. Louis, Mo.—The first coal was put into the ovens of the new $2,000,000 coke plant of the Laclede Gas Light Co. in Carondelet recently. Only 33 of the 56 ovens were started since the bringing in of all the furnaces must be done gradually and carefully because of the expansion that is caused by the heat. About 200 men are now employed at the plant. The coal used is brought by rail from Kentucky near the Virginia line. It is expected that a barge line will be established later for the more economical handling of the coal. The H. W. Warren Coke Co., distributers, is booking orders for delivery.

Fleming—The week ending June 26 was the largest in point of coal shipments in the history of the Elk Horn Mining Corporation in the Fleming-Haymond field. This field has only been opened about two years and business looks brighter now than ever before. Five mines are running night and day to keep the orders filled. Men are scarce and good coal loaders are in great demand. The Lexington & Eastern R.R. is keeping the sidings clear of standing coal only by an extra effort and long hours on the part of the train crews. It is expected another train will be put on soon to take care of the steadily increasing output of these mines.

Bluefield, W. Va.—It has been announced by officials of the Carolina, Clinchfield & Ohio R.R. that traffic will begin over the new extension between Elkhorn City, Ky., and Dante, Va., about July 1. By the completion of this road the coal fields of eastern Kentucky, including the Elkhorn and Boone's Fork in Letcher County, will be given a southern connection and an important one. Much of the coal from the plants around Jenkins will go over the new Clinchfield road. On the 32 miles of this road there are 26 tunnels, one of them, the Sandy Ridge, being nearly two miles long. The work of concreting this big tunnel from end to end has just been completed.

Lexington, Ky.—Following a meeting of the officers of the Kentucky River Coal Corporation, it was announced that contracts have been made with various operators on First Creek, about three miles from Hazard, Ky., for a minimum output of 550,000 tons of coal annually. The coal will be sent to the market over the Lexington & Eastern branch of the Louisville & Nashville R.R. A 5½ mile spur is being built up First Creek for the purpose of getting the coal to the main line. The Harvey Coal Co., and the Blue Diamond Coal Co. have begun operations and a Cincinnati syndicate of coal men has taken a lease and will operate a mine under a corporation not yet completely organized.

Martinsburg, W. Va.—The coal tonnage moved over the Baltimore & Ohio R.R. system for 11 months of the present fiscal year shows a decrease as compared with the previous 11 months. From July 1 to May 31, the road hauled 26,475,988 tons of coal, as compared with 32,036,361 tons for the previous 11 months. During September of last year 2,878,836 tons of coal were moved, while during February of the present year 1,906,210 tons were handled. These were the best and poorest months of the period. Coke tonnage for the 11 months totaled 2,660,391 tons, as contrasted with 3,714,534 tons for the corresponding period of the previous fiscal year, thus amounting to a reduction of 1,054,143 tons for 1915.

St. Louis, Mo.—R. W. Ropiequet, of Belleville, Ill., attorney for the St. Louis Coal Operators' Traffic Bureau, has filed an argument and brief with the Interstate Commerce Commission against proposed advances in coal rates from various points in Illinois. The proposed advances are declared to be discriminatory against the Illinois mines when compared with competing fields serving the same territory, and as against the coal traffic as compared with other traffic upon which no advances are proposed. Issue is taken with the contention of the carriers that the present coal rates are comparatively unremunerative and that the coal does not bear its just proportion of the burden of transportation. The brief maintains that the coal traffic is the most important factor in the production of increasing return for the carriers, that it is a remunerative traffic and that it contributes more to the burden of transportation than the average traffic. It is declared that the advances proposed would result in a greater tonnage from the eastern fields via Duluth, no advance in the rate from these fields having been proposed, and the result would be that coal from these fields would supplant Illinois coal.

Coal Trade Reviews

General Review

Anthracite market dull and discouraging. Bituminous outlook continues cheerful though current market is under heavy pressure.

The heavy pressure on anthracite is forcing the companies to make concessions in the way of long-term credits that will carry the retailers over until the coal begins moving out to the consumers in the fall. In fact the market is full of conflicting rumors and cross currents. There are many retailers who are confident they will be able to obtain low prices well into September, but there are other conservative observers who predict a tremendous rush for coal to make up the deficiency caused by the deferred buying this summer. Chestnut coal is under particularly heavy pressure. There is an unusual amount of this grade going into storage, and it would not be surprising to see some heavy cuts offered shortly. Still more drastic curtailment programs have been instituted, and the leading companies will practically discontinue operations entirely during the first week of this month. The anthracite market has resolved itself into a waiting game for the time being.

It has developed that there has been considerable quiet buying of bituminous at the recent low level, and the best informed operators are proceeding cautiously over commitments on new business while conservative buyers are showing more of a disposition to close. It is still evident, however, that the current situation is soft in spots. Some pressure is evident on Hampton Roads coal although recent dumpings have been exceptionally heavy, and the accumulation reduced to a more normal basis than for some time.

The stir in iron in the Pittsburgh District has created a better feeling in trade circles although there has been a tendency to place an exaggerated value on this. The current market fails to reflect any actual improvement while the Lake trade continues disappointing with reports of large stocks at the upper ports. The anticipated movement of large crops in the fall is the most encouraging feature in the current situation.

Although the Ohio trade is being heavily over-solicited, there is still evidence of an improved tone. Interest for the moment is centered on the stocking business, and the poor collections are interfering with this to some extent. Industrial conditions fail to show any improvement, but the threshing demand is becoming a factor in the situation, and there is some activity on negotiations for school contracts.

The Middle Western situation is still characterized by a general uncertainty. More inquiries are reported in some directions, particularly for future delivery, and if these materialize into actual business, production will have to be materially increased. Stocks are generally low, and there must be some buying developed before very long. The operators have the price situation well in hand, and there is not a great deal of price cutting. Screenings continue the strongest department of the trade.

A Year Ago—Heavy curtailment in the anthracite region marked the inception of the usual mid summer lethargy. Individuals are working full and forcing the market. Eastern soft-coal buyers fail to respond to unusually low prices, and trade devoid of further absorbing power. Western situation is developing a better tone.

BUSINESS OPINIONS

Boston News Bureau—The attention of leading financial interests today is focused chiefly on the efforts of foreign governments to establish a credit here in order to make payments for purchases of war supplies. It is little wonder that the situation is perplexing. People are awaiting some definite trend to affairs before expanding their commitments. So long as the foreign outlook remains so clouded general conditions will be unsatisfactory. Manufacturers of war supplies are busy and could be much busier if they were confident of receiving quick payment for their products. Until, therefore, the ways and means for these payments are found there will be more or less hesitancy in operations.

Engineering News—Contracting work has not been so active. There are a great many small jobs in prospect, but the larger jobs are being held up awaiting more definite news relative to financiering. At least one contract has been noted where the condition precedent to the beginning of the work was that the United States should not be at war on Aug. 1. The expected shortage of labor has not materialized as yet. There is considerable apprehension at the steel mills, but outside of one or two instances there has been no difficulty in securing all of the needed labor. Among contractors no difficulty has as yet been experienced in securing sufficient men to do the work. This applies to all classes of laborers. Several strikes have occurred, which indicates that labor is better employed.

Dun's Review—Cross currents continue in business channels, but the tide of returning prosperity is gradually rising. Good news still predominates and further progress is manifest, notwithstanding the unseasonable weather at many points, and especially in the West. It is like old times to hear of orders in excess of capacity in some instances, and the mills are being pushed to meet the heavy demands.

Bradstreet's—Trade news is irregular, current distribution being repressed, but, on the other hand, orders for future delivey tend to enlarge. Unseasonable weather hampers retail trade, results in forced sales, restricts sorting-up orders going to jobbers and detracts from crop promise.

The Modern Miller—In Oklahoma heavy rains have damaged considerable wheat. In the southern part of the state three-fourths of the crop is in shock; in central districts one-half, and in northern Oklahoma cutting is light. In Kansas rains and flooding have caused some loss. Prospects are not materially below June 1. Nebraska has prospect of a large crop. Some districts report fly damage. Heavy hail storms have been a feature. In southern Illinois and Indiana heavy rains and wind have leveled wheat and delayed cutting. Much ripe wheat will be cradled. Northern Missouri, central Illinois, central Indiana and Ohio have prospects of fine wheat crop, but the movement will be late.

Am. Wool and Cotton Reporter—The wool market was comparatively active during the past week. The general trend of the market is upward and there is a very optimistic tone.

Iron and Steel—Some business in the heavy lines has developed in the last week. The American Bridge Co. was low bidder on 24,000 tons of fabricated material for the approach to the "Free Bridge" at St. Louis. A contract has been closed for a bridge at Kansas City involving 5400 tons. A new freight station in Chicago will call for 12,000 tons and the new shops that are being built in all parts of the country are taking a great deal of material. It is said that the shipments of tin plates in June by the leading interest were larger than any month since February 1913. It is estimated that the unfilled orders of the United States Steel Corporation will show an increase of 200,000 tons in June. The Republic Iron and Steel is operating to 90% of capacity and orders are being received involving more tonnage than is being shipped.

ATLANTIC SEABOARD

BOSTON

Pocahontas and New River prices uneven, but nothing significant has developed. Georges Creek unchanged. Pennsylvania shippers find their situation improved. Water freights slightly firmer. Anthracite curtailment forestalls any great accumulation of domestic sizes.

Bituminous—While there is no significant price movement the general feeling is that the Pocahontas and New River situation will bear close watching the next month or so. There are still soft spots in the market f.o.b. but at this end there is practically no coal awaiting purchasers. It develops that there has been considerable quiet buying the past fortnight when concessions were being offered and on the whole prices are somewhat firmer at this writing. It will, however, take a material strengthening of the export market to bring about anything like a horizontal f.o.b. basis.

The uneven conditions at Hampton Roads piers with respect to coal standing are, of course, reflected in this market. Some of the agencies are pressing hard for business and others are holding aloof with a fair amount of current business on hand. The latter usually represent those shippers who have the more favorable connections with trade off-shore.

There are no new developments in Georges Creek. A large share of the output is still being reserved for export, chiefly on old sales, and only a minimum tonnage is coming forward to New England. So much business this year on this grade has been relinquished to the better known brands from Pennsylvania that it is probable that from now on Georges Creek will figure less and less in this territory.

Several of the Pennsylvania coals have made a good showing lately in the volume of coal placed and it is rumored some of the operators already have enough orders booked to leave them comfortable on a normal output the rest of the year. Prices are so far unchanged, but it is likely there will be a firmer tone in the course of a few weeks.

Water Freights are a little stronger than when last reported; 85c. is the current rate on large vessels, Hampton Roads to Boston, although a few steamers that are not at present available for traffic off-shore are accepting coastwise charters at 5@10c. less. Rates on Long Island Sound remain the same.

Anthracite—Shipments come forward very slowly. Curtailment is in effect in all parts of the region and little is now heard of any surplus in domestic sizes. The retail demand is beginning to start up but in view of the large stocks in New England there is not much prospect of any spurt to the wholesale demand until fall.

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines*	$0.85@1.40	$1.20@1.60	$1.67@1.77	
Philadelphia*	2.10@2.65	2.45@2.85	2.92@3.02	
New York*	2.40@2.95	2.75@3.15	3.22@3.32	
Baltimore*	....	....	2.85@2.95	
Hampton Roads*	....	....	....	$2.65@2.80
Boston†	....	....	....	3.60@3.78
Providence†	....	....	....	3.45@3.73

* F.o.b. †On cars.

NEW YORK

Bituminous market experiencing one of its dullest periods though shipments are heavily curtailed and prices fairly steady. Anthracite consumers still holding off. Operations much reduced. Nut coal particularly long.

Bituminous—The export trade continues the big factor in the soft-coal market. While reports are heard from various sources of heavier demand for ordinary grades they always prove to be only flurries. The situation as a whole is in about the same condition as last week.

The market is experiencing one of its dullest periods. Fortunately operators are not flooding tidewater with coal, which enables wholesalers here to keep prices steady. There has been no material change in quotations for the past two or three months, although it has been possible for quick buyers to pick up stray cargoes at much lower figures.

There is little spot coal about the harbor and demurrage stock is not much in evidence. The mines are working about half time. Some operations with a good quality product are working nearly full time. Shippers have become reconciled to the situation and do not look for a better market until fall. Contract coals from the Southern ports are maintaining good prices.

Many new inquiries are reported by exporters with some contracts being closed. Much interest is being taken in the publication of the export statistics for June.

Current quotations continue about as follows:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.30@3.40	$3.30@3.40	$3.30@3.40	$1.75@1.85
Georges Creek Tyson	3.00@3.10	3.00@3.10	3.00@3.10	1.45@1.55
Clearfield:				
Medium	2.65@2.80	2.55@2.65	....	1.10@1.25
Ordinary	2.55@2.60	2.55@2.60	....	1.00@1.10
Broad Top Mountain				1.10@1.45
Cambria County:				
South Forks	2.90@3.05	....	....	1.35@1.50
Nanty Glo	2.75@2.80	....	....	1.20@1.25
Barnesboro	2.65@2.70	....	....	1.10@1.15
Somerset County:				
Quemahoning	....	2.70@2.85	2.70@2.85	1.20@1.30
Medium	2.65@2.70	2.60@2.65	2.60@2.65	1.10@1.15
Latrobe	2.45@2.55	....	....	.90@1.00
Greensburg	2.75@2.80	....	....	1.10@1.15
Westmoreland	2.95@3.20	....	....	1.15@1.40
West Virginia Fairmont ¾		2.60@2.70	2.60@2.70	.80@ .90
Fairmont mine-run		2.50@2.60	2.50@2.60	.70@ .80
Steam		2.45@2.50	2.45@2.50	.90@ .95
Western Maryland		2.35@2.40	2.35@2.40	.80@ .85

Anthracite—It is a waiting game in the anthracite market. No improvement is looked for until fall. Everybody who cares to has full bins but there are many who are still buying from hand to mouth. This condition is partly due to the present situation where it is possible to buy certain individual coals at April prices. Some retailers are of the opinion that they will be able to duplicate these prices in September. Money is short with many.

Restriction continues to be the rule at the mines. Individuals are now working on about the same schedule as the companies—about half time with some doing a trifle better. The usual rush of orders in the last week of the month to save the ten cents per ton discount did not materialize in June. Nut coal continues the longest of the prepared sizes; some cargoes were reported as being picked up at $4.65. Egg and stove sizes are quiet but moving better than nut coal.

The curtailing of operations is having its effect on the steam coal situation. These sizes are not much in evidence but are plentiful. The better grades are mostly in demand. The buckwheats are dull. Some grades of No. 1 have been quoted at $2 but the average has been higher for the better free-burning coals. Quotations on Schuylkill district rice coal vary from $1.65 to $1.70.

Current quotations are about as follows:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$4.85		$4.90	
Egg	5.10	$4.80	5.15	$4.85
Stove	5.10	4.80	5.15	4.85
Chestnut	5.35	5.00	5.40	5.05
Pea	3.35@3.50	2.70@2.95	3.40@3.55	2.75@3.00
Buckwheat	2.50@2.75	2.05@2.30	2.55@2.80	2.10@2.35
Rice	2.00@2.25	1.70@1.85	2.05@2.30	1.75@1.90
Barley	1.75@2.00	1.45@1.70	1.80@2.05	1.50@1.75

PHILADELPHIA

Anthracite market is conflicting; some report slight betterment and others only continued inactivity. Chestnut price predicted to slump. Pea still low, with doubts as to future. Bituminous export business growing, but domestic market inactive.

Anthracite—Conditions are so variable and conflicting that it is difficult to make an accurate analysis of the market. In the city proper the dealers have practically concluded that they are done until frost comes, while from the suburban section come reports that business is holding up fairly well. Most operators complain of an unusual dullness, but two of the large companies report their tonnage for the month to date slightly increased over the same period last year.

There are rumors that chestnut coal is becoming so inactive that an unusual amount is going into storage and price cutting on this size would not be at all surprising. Chestnut has been more or less inactive since stove coal practically took its place in the market by a rearrangement of the circular prices two years ago.

There have been some peculiar angles to the pea situation. Low prices continue to rule, with little tonnage absorbed, and there are some who are becoming doubtful of the ability of this size to regain the circular price of $2.50 even in the fall; big sales are reported at $2, protected beyond the first of the year. On the other hand another company asserts they have at no time sold pea at less than $2.10 and that they have such confidence in a good fall trade that rather than sell at below that figure they are now arranging to store this size at the mine.

Another concern is reported to be making large deliveries of steam coal to their consignees with the understanding that payment is only to be made when the coal goes to the consumers in the fall. This arrangement practically resolves itself into giving the operator storage room without the usual cost of storing and picking up.

Most of the collieries have continued on the three-day working schedule and it is likely that the working time for July will be even less. Starting with the close of work Wednesday, June 30, the mines will not open until Thursday, July 8, this arrangement being made to cover the usual idleness due to the celebration of the Fourth of July.

From the midst of all the conflicting conditions the one dominant note of optimism persists and that is—we are going toward an exceptionally good business in the fall.

The new circular prices for July are as follows:

	City	Tide		City	Tide
Broken	$3.30	$4.55	Pea	$2.50	$3.25
Egg	3.55	4.80	Buckwheat	1.25	2.25
Stove	3.80	4.80	Rice	0.85	1.75
Chestnut	3.95	5.05	Barley	0.50	1.50

Bituminous—Despite the usual and expected summer dullness there appears to be a slightly improved tone to the market, especially on Tide shipments. One of the very largest operators expressed satisfaction at the increased shipments from their mines, practically the entire production going to Tidewater. While the domestic trade is not near so active, yet improvement is in sight and felt to a slight extent. This should increase, as many of the largest industrial plants in this territory are going to full capacity and many of them are starting the erection of buildings that will double their plants in six months at the latest. Many of these plants have immense contracts for war munitions extending over periods from two to three years.

Prices have not appreciably changed and rule about as follows:

Georges Creek Big Vein..	$1.60@1.75	Fairmont gas, mine-run..	$1.15@1.25
South Fork Miller Vein..	1.50@1.60	Fairmont gas, slack......	0.65@0.75
Clearfield (ordinary).....	1.00@1.20	Fairmont lump, ordinary.	0.85@0.95
Somerset (ordinary).....	1.00@1.15	Fairmont mine-run......	0.75@0.80
West Va. Freeport.......	0.85@0.95	Fairmont slack..........	0.45@0.75

Ocean charters from Philadelphia have been announced as follows:

Vessel	Nationality	Destination	Tons	Rate
Thistleard	British	Spain	2533	
Oreland	British	Rio de Janeiro		
Millie R Bohannon		Charleston, S. C.	900	$1.10
Herbert May		Savannah	600	
Eva B. Douglas		Wilmington, N. C.		1.00
Charles N. Simmons		Porto Cabello		4.00

Note—Steamers are indicated by **bold face** type.

HAMPTON ROADS

Shipments foreign continue heavy, especially to Italian ports. Prices stationary with fair demand from foreign markets. Heavy railroad dumpings.

The dumpings over the various piers at Hampton Roads have shown up heavy, especially as regards cargoes for Italian ports. Coastwise shipments have been fair and the U. S. Government has also taken some coal. In addition to the New River and Pocahontas coal exported there has been some little high volatile and anthracite shipped. The anthracite, however, only amounted to 85 tons. Coastwise shipments have consisted of New River and Pocahontas mine-run, nut and slack and high volatile coals. Shipments foreign continue to move by sail as well as steam tonnage. The cargoes shipped in sailing vessels during the past week have all been for South American ports with one exception.

Prices at Hampton Roads remain practically the same as for some weeks but with the accumulation somewhat nearer normal. There is a fair amount of vessel tonnage in port with ample coal on hand to take care of same. The dumpings for the Norfolk & Western Ry. for June will be considerably in excess of their May shipments while those of the other two roads will be near their May figures.

The following vessels have cleared from Hampton Roads during the week June 18 to 25:

Norfolk

Vessel	Destination	Tons
Berwindvale	Havana	8100
Calabro	Naples	2362
Bellgrano	Peru	550
Dionyssios Stathato	Bilbao	5646
Orla	Rio	
Atland	Stockholm	6833
Agnelo Parodi	Santa Liberata	5355
Carlo	Cagliari	7100
Iddsleigh	Leghorn	5800
Ecaterini	Piraeus	5561
Labor	Spezia	5992
Dinsdalehell	Porto Ferrajo	6314
Augustus Welt	Rio	1592
Tsiropinas	Palermo	4505
Agnello Ciampi	Savona	4650
Sebastiano	Genoa	4288
Kineo	San Juan	2994
Margam Abbey	Rio	6900
William Clifford	Canary Islands	2253
Ferm	Pernambuco	3080
Prosper 3rd	La Plata	5979
Jacatra	Port Said	8006
Tjisondari	Savona	8091
Ecclesia	Spezia	5700
Capac	Iquique	950
Patras	Genoa	4200

Newport News

Vessel	Destination	Tons
Timandra	Rio	2000
Skogstad	Bridgetown	5545
Vulcano	Italy	7300
Giovani G.	Italy	5081
Gowenburn	Rio	5100

Note—Steamers are indicated by **bold face** type, others being barks and schooners.

Railroad Tonnages—Dumpings over the local piers for the past several weeks compare as follows:

Railroad	Week Ending May 29	June 5	June 12	June 19	June 26
Norfolk & Western....	146,462	156,011	197,533	207,824	213,279
Chesapeake & Ohio....	83,678	44,702	39,447	71,511	79,870
Virginian............	61,688	38,372	34,975	51,644	87,840
	291,828	239,085	321,955	330,979	380,989

BALTIMORE

Reports from mining districts indicate an increased production. Prices continue flat. Export trade holds up well.

An increasing demand from the Lake region and the big export movement are apparently having some effect. Several mining properties of the Maryland Coal Co. and the Davis Coal & Coke Co., for instance, are reported as now doing full time, or reopened for business, during the past ten days. Some companies in West Virginia are seeking men.

While this evidence of better business brings a feeling of encouragement, the coal trade realizes now that a general revival will be slow. Coal is still offered very cheaply at the mines. Demand on contract is slow, and those mining properties showing the present increase are for the most part working on some special orders.

Export business is holding up strong. During the week ending June 26 a total of 77,912 tons was sent out on export cargo account, while 13,248 tons was taken for bunkering. Chartering continues heavy, and there is every prospect for strong trade for weeks to come, at least.

The following steamers were chartered the past week, the Atlantic range quotations being noted, as several will load here:

Vessel	Nationality	Destination	Rate
Apolo	Spanish	River Plate	
Sowell	British	West Coast Italy	$10.56
Tsirapuria	Greek	West Coast Italy	
Mongibello	Italian	West Coast Italy	10.08
Sicania	Italian	West Coast Italy	10.08
Westgate	British	Campana	8.52
Francisco Ciampa	Italian	West Coast Italy	10.08
Allanton	British	Maddalena, Sicily	
Prosper III	Norwegian	River Plate	7.68
Chorley	British	Bahia Blanca	8.88
North Britain	British	River Plate	9.60
Two Ropner Steamers		West Coast Italy	9.60

OCEAN CHARTERS

Coal charters have been reported by the "Journal of Commerce" as follows:

Vessel	Nationality	From	To	Tons	Rate
Herbert May		Philadelphia	Savannah	318	
Eva B. Douglas		Philadelphia	Wilmington, N. C.	910	$1.00
Millie R. Bohannan		Philadelphia	Charleston	579	1.10
Henry S. Little		Philadelphia	Summerside, P.E.I.	984	2.25
Balgray	British	Baltimore[1]	Piraeus	2318	10.56
Patras	Italian	Baltimore[1]	Italy[2]	1729	9.60
Cleanthis	Greek	Baltimore[1]	Italy[2]	1938	9.93
Devian	British	Baltimore	Chili	2285	
Florida	Danish	Baltimore	Copenhagen[3]	2827	
Alston	British	Baltimore	River Plate	2363	
Oreland	British	Philadelphia	Rio Janeiro	2709	
Styliani Bebis	Greek	Baltimore	Italy[2]	2216	10.08
Angelo	Italian	Baltimore	Italy[2]	2333	
Kanaris	Greek	Baltimore	Italy[2]	2432	9.84
	British	Atlantic Range	Barcelona[4]	6500	8.88
Charles N. Simmons		Philadelphia	Porto Cabello	716	4.00
Lewis H. Goward		Baltimore	Porto Rico	1054	
Ferndene	British	Atlantic Range	Italy[2]	2444	9.84
Chulmleigh	British	Atlantic Range	Barcelona	2567	8.88
Angelesea	British	Virginia	Buenos Ayres	2795	3.12 9.00
(Ropner Boat)	British	Atlantic Range	Italy[2]		9.60
Sidmouth	British	Atlantic Range	Italy[2]	2506	
Caprera	Italian	Atlantic Range	Italy[2]	3212	
Thistleard	British	Baltimore	Spanish port	2553	

Note—Steamers are indicated by **bold face type**, all others being schooners.

[1] Or Virginia. [2] West Coast. [3] Or Gothenburg. [4] Valencia or Tarrangona.

OCEAN FREIGHTS

Charters to Europe somewhat easier. Steamers to South America less plentiful.

A number of steamers were chartered last week for coal to Spanish and Italian ports, and numerous other boats offered for this business, at lower rates than those recently quoted. To the Plate steamers offer sparingly, and a steamer of about 7000 tons coal capacity was chartered, Virginia to Buenos Aires, at $8.64, option Port Militar at $9, but we consider these rates a little above the market, as we chartered steamers for similar business at lower rates.

Freight rates to other destinations are unchanged.

To	Rate	To	Rate
Havana................	$2.00@2.25	Bermuda...............	**$3.00**
Cardenas or Sagua......	**2.75**	Vera Cruz.............	3.50@3.75
Cienfuegos.............	2.75@3.00	Tampico...............	3.50@3.75
Port au Spain, Trinidad.	3.50@3.75	Rio...................	**8.64**
St. Lucia..............	**3.50**	Santos*...............	**8.88**
St. Thomas.............	3.00@3.25	Montevideo............	**8.40**
Barbados...............	3.50@3.75	Buenos Aires or La Plata	**8.52**
Kingston...............	2.75@3.00	Rosario...............	**9.12**
Curacao................	**3.50**	West Coast of Italy.....	**9.36**
Santiago...............	2.50@3.00	Barcelona**............	**8.64**
Guantanamo.............	2.50@3.00	Valparaiso or Callao....	6.75@ 7.00
Demerara...............	**4.25**	Marseilles.............	**8.88**

Note—Rates noted in **bold face type** are only approximate.

* Consignees paying dockage dues. **Spanish dues for account.

W. W. Battie & Co.'s Coal Trade Freight Report.

COKE

CONNELLSVILLE

Sentiment less favorable, market failing to respond to what was considered good news. Prices no higher than in January. Shipments constantly increasing.

In some coke circles the feeling is distinctly less hopeful than a fortnight ago. It is reflected that if general indications really count for anything coke prices should have improved long ere this. While Connellsville coke production and shipments have increased by two-thirds since last December, the increase has been chiefly in the coke of the producer-consumer class. The demand for merchant coke, which comes chiefly from the merchant blast furnaces, has increased but little, and a canvass of the merchant pig-iron trade suggests that perhaps the demand upon the merchant furnaces is not going to increase much after all, and if so there will not be much additional market for merchant coke. One merchant furnace, which has a coke contract at one price to July 1 and at 20c. more for the second-half, is considering blowing out July 1, finding it difficult to sell iron at any price. The coke market on the whole is no higher than it was in December or January and close analysis might show it actually a shade lower. We quote: Prompt furnace, $1.50; second half furnace, $1.75; prompt foundry, $2@2.50; contract foundry, $2.20@2.50, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended June 19 at 348,510 tons, an increase of 13,996 tons, and shipments at 351,774 tons, an increase of 19,181 tons. The increased production was due entirely to the furnace ovens, the merchant ovens losing a trifle. For five consecutive weeks shipments have increased. The low point in production and shipments fell last December, with about 200,000 tons a week.

Buffalo—The reported better feeling in iron continues and it affects the coke trade favorably in a way that it does not affect coal. Coke dealers are much encouraged, for they think it means better business in coal before long. There appears to be a larger supply of foundry than of furnace coke, with the price of the latter consequently stronger. Quotations are firmer on the basis of $4.25 for 72-hr. foundry, $3.80 for 48-hr. furnace and $3.30 for stock coke.

Chicago—Little change is to be reported in the price of coke. The demand for domestic coke is improving slowly, and prices are being well held. Furnace and foundry sizes are easy, and quotations somewhat variable. Prices are as follows: Byproduct, $4.65@4.85; Connellsville, $4.75@5; Wise County, $4.75; gas coke, $3.75@5, furnace, $4.65@4.75.

LAKE MARKETS

PITTSBURGH

Sentiment continues somewhat better but actual trade scarcely improved. Operations 55 to 60%. Slack a shade easier in price.

There is a continuance of the better sentiment in coal trade circles reported a week ago, but the market itself does not reflect any material improvement. The coal industry has perhaps expected too much from the observed improvement in the steel industry; the improvement, while very marked, is apparently due largely to the increased demand for steel for export, both direct export and the manufacture of war munitions for export, and that part of the steel demand does not of course involve any increased coal consumption. If the present demand for steel were all domestic it could not have occurred without a corresponding improvement in industrial conditions generally, requiring the consumption of more coal. The steel industry itself is now a good consumer of coal, but its customers are not correspondingly good consumers.

The Lake trade continues disappointing. The stocks at upper Lake docks are not worked off and shipments are kept at a low rate until the docks can be cleared. With such very good crop prospects, the coal movement later in the season should be much better, but for the first half to be bad and the second half moderately good seems to be about all that can be expected from the present Lake coal season.

Demand for export coal only occasionally reaches the Pittsburgh district, but the shipments of export coal from the Connellsville region are fair, and promise to increase. The Pittsburgh coal district is operating at 55 to 60% of capacity. Slack is a trifle easier, otherwise prices for free coal are unchanged, as follows: Slack, 50@55c.; nut and slack, 90@95c.; nut, 95c.@$1; mine-run, $1@1.05; ¾-in., $1.10@1.15; 1¼-in., $1.20@1.25, per net ton at mine, Pittsburgh district. The contract market for mine-run, to Apr. 1, remains nominally $1.15.

BUFFALO

Some bituminous shippers are finding the demand slightly better. There is less coal waiting to be sold, but the same anxiety to sell. Anthracite not moving any faster.

Bituminous—The feeling is a little better each week. There is no doubt of a stir of some size in iron, but it is too small and recent yet to mean much to the coal trade. Some shippers will not admit that there is any improvement and are sure that there is not going to be any till after the warm weather is over. The amount of Youghiogheny coal on track is less which is a good sign; one shipper reports that he was lately unable to find any in the spot market and had to wait for it. This gives a better market to the cheaper coal produced nearer here and indicates that the other is going to another market. The lake trade is taking more bituminous coal than it was. The export demand is also better by ocean routes, though it does not appear that Canada is taking more.

Slack is selling at low figures but this also means a better Lake trade, as that turns out a large amount of slack. The lake cities prefer a larger proportion of sizes than is produced, so that the home market has to absorb some surplus slack, which often makes it dull through the Lake season. The bituminous prices are quoted as formerly for base, with perhaps a little less cutting than the average, best Pittsburgh lump selling at $2.70, three-quarter at $2.55, mine-run at $2.45, and slack at $2.25. About all the other coal coming here is Allegheny Valley, which takes a price of 25c. less.

Anthracite—The demand is still very light. A few independent shippers report a fair trade, but this is probably due to their not having a great amount to sell. This trade is larger than it used to be and it no doubt cuts into the old line companies somewhat. Local retailers are only doing a small business and will have to fall back on the city work or something of the sort to keep busy. It has been some time since the anthracite mines in general were running on such short time. But for the Lake trade, which is as large as it often becomes at this time of the year, the mines would be very inactive. Shipping agents in the Lake trade say that they have plenty of room on the Upper-Lake docks in spite of reports that sales there are not any more liberal than they are here.

The movement by lake for the week was 170,000 tons, nearly all going to Chicago, Milwaukee and the head of Lake Superior. The small ports appear to be well supplied and the shipments to leading ports are not generally represented by sales.

TOLEDO

Lake movement better. West Virginia coals particularly strong here.

Business generally is better especially in the Lake trade which has picked up wonderfully. The C. & O., docks have recently been doing a record business and the Hocking docks are also unloading quite a lot of coal. The big machines are working a good share of the time now and a boat can be loaded in a comparatively short time, 10,000-ton cargoes being loaded in about four hours. A great deal of West Virginia coal is moving.

Smokeless coal is not in very good demand but there is not very much on the market except mine-run which is extremely plentiful and cannot be moved at any price. Pittsburgh No. 8 is not moving freely. It is still early for threshing coal.

COLUMBUS

A slight improvement is noted in domestic trade. The stocking season is now at hand and there is a slightly better tone. Steam business continues quiet.

The attention of coal men is centered on the stocking season which is now at hand. It is believed that the demand for stocking purposes will be as large as ever, although deliveries are likely to be delayed. There is an improved tone and future prospects are brighter.

Dealers' stocks are the subject of considerable discussion; reports show that some are larger than usual while others are very low. This spotty condition extends throughout Ohio, Indiana and Michigan. Collections are poor which has a bad effect on stocking. Retail trade is quiet although some demand is reported for threshing purposes. Threshing coal is always quite a factor in the rural sections of Ohio. School coal is also attracting considerable attention and many contracts of that nature are being looked after.

Lake trade continues quiet because of the congestion at the Upper Lake ports. It is doubtful if there will be any marked increase immediately after July 1. The movement from the dock is still slow. Considerable West Virginia coal is being shipped to the Northwest but Ohio fuel is not moving as in former years. Eastern Ohio field is gradually increasing its Lake shipments. In the meantime the Hocking Valley docks at Toledo are fairly busy. The tonnage handled for the week ending June 25 was 98,000 as compared with 82,000 tons the previous week. The total tonnage handled over the docks since the opening of navigation is 741,000.

The only strong point in the steam department is the demand for nut, pea and slack, and that is because of limited production. There is much talk of export coal which will undoubtedly strengthen the Columbus trade, although no coal will be exported from Ohio.

Mines have been working at about the following percentage of full capacity:

District	Week Ended June 5	June 12	June 19	June 26	District	Week Ended June 5	June 12	June 19	June 26
Hocking....	30	25	25	25	Cambridge.	35	35	30	30
Jackson....	20	20	15	20	Masillon...	35	40	35	30
Pomeroy ..	50	50	50	45	Eastern O..	25	30	45	50
Crooksville.	35	30	30	25					
					Average..	33	33	33	32

Prices in the Ohio fields are:

	Hocking	Pomeroy	Kanawha
Rescreened lump..............	$1.45	$1.50	.....
Inch and a quarter............	1.35	1.35	$1.30
Three-quarter inch............	1.25	1.30	1.25
Nut.........................	1.15	1.25	1.15
Mine-run....................	1.05	1.10	1.05
Nut, pea and slack............	.70	.75	.65
Coarse slack.................	.60	.70	.55

CLEVELAND

Spot prices from 5 to 15c. under shipment quotations. Lake shippers moved all the coal they could get to the Lakes prior to the end of the month.

All kinds of coals were sold at extremely low prices Monday. No. 8 mine-run sold as low as $1.60, while three-quarter was only 5c. higher. Bergholz, Fairmount, and all Ohio coals went at proportionately low prices. Coal consumption is very much larger than two months ago, but the Lake business leaves too large a surplus for the local market to consume.

Lake shipments the first three days of the week were comparatively heavy. All shippers were working to gain credits on demurrage and cleaned up everything they could find tonnage to hold. The supply of ships was rather light the first half of the week, but the last half there was more capacity than could possibly be used.

Following July 4 the Lake shipments are expected to be much lighter than they have been. The local market is also expected to be rather depleted the first few days, but it will soon have more than enough. The Lake trade will be smaller all through July and part of August. New grain will begin to move the middle of August, and the coal shipments from Upper Lake docks will increase proportionately.

Shipment quotations are as follows:

	Pocahontas	Youghiogheny	Bergholz	Fairmont	Ohio No. 8
Lump...........	$3.45	......	......	....	......
Lump, ¾ in.....	....	$2.15	$1.90	$1.85@1.90	$1.85@1.90
Egg...........	3.45	......	......	....	......
Mine run......	2.65	2.05@2.10	1.80	1.80	1.75@1.85
Slack..........	......	1.45	1.45	1.45	1.45

CINCINNATI

The market is very quiet with buying at a minimum. Steam consumption extremely slow.

As yet there is practically no stocking. The trade is being heavily over-solicited, and dealers feel that they can get coal at any time, in any quantities and at almost any price. The Lake movement is very small and unsatisfactory as compared with normal years, or even with last year. It is evident that Canadian consumption, which takes considerable coal through the lakes, will be very small. Industrial conditions remain bad save in a very few lines, and such contracts as have been closed are at substantial concessions, amounting to 10c. or more.

LOUISVILLE

Stocking movement to begin soon. Possibility of a readjustment in freight rates that will extend certain markets.

The Kentucky market shows virtually no improvement, except perhaps a disposition among the retailers to prepare for the consumers' stocking which will begin soon. The operators are watching with much interest the proceedings in the matter of the complaint to the Interstate Commerce Commission over division of rates on coal. The alleged unfair methods of certain railroads in division of their joint rates shut the Kentucky operators out of the contracts let by the Seaboard Air Line and the Atlantic Coast Line.

Prices are quoted on the May and June basis, as follows: Block, $1.30 to $1.40; round, $1.20 to $1.25. Nut and slack unchanged.

MIDDLE WESTERN

GENERAL REVIEW

Good future demand prompt shippers to uphold prices. Domestic sizes still slow. Screenings softer. No stir in anthracite.

Demand for coal grows slowly, but the general situation is improving. The steam trade shows a slight tendency toward lower prices, and screenings have softened 5c. to 10c. per ton but they are expected to improve again soon. The steam coal prices fluctuate with the increase or decrease in production of domestic sizes, and as the latter advance prices become easier on steam sizes.

Operators apparently have the price situation well in hand and there is very little cutting. The low stocks in the retail yards must necessarily cause increased orders shortly. More activity is being shown in industrial circles, and the railroads are reporting increased traffic, all of which will doubtless stimulate the demand for coal. The approach of the harvesting season has also caused increased orders for threshing trade.

It is said that several railroad contracts embracing considerable tonnage will be executed within the next ten days. An increasing number of inquiries covering future deliveries are coming in and if these materialize into orders production will have to be increased. Country dealers still complain of slow collections, and a great many of them are not stocking up for this reason. Lake shipments are still at a low ebb, and conditions confirm the previous prediction that no Lake movement of any consequence may be expected until toward the latter part of July.

CHICAGO

Price advances cause some increased buying at the month end. Screenings continue high.. Indiana market less favorable. Anthracite under pressure.

The Franklin County field has definitely announced advanced prices to take effect July 1, with resultant stimulation of orders for immediate shipment. The increase at the Illinois mines seems to be more particularly in the Southern group. The price situation in the Franklin and Williamson County fields is in a satisfactory state. Steam lump is somewhat draggy, with prices weak. Screenings have lost an average of 10c. per ton.

A fair volume of steam coal business has been done by Saline and Harrisburg operators and there has been good shipments of domestic sizes for harvesting purposes. There are no surplus screenings and operators are receiving top-notch prices for spot shipments.

The demand for steam sizes from the Indiana mines continues at a low point. No change in current prices for either steam or domestic coals has occurred. Orders for the threshing trade have not been as heavy as expected.

More harvesting coal is moving from the Clinton field than elsewhere, but the steam trade is soft. There is some Knox County coal moving to Chicago schools, but otherwise the mines are averaging about 2½ to 3 days per week running time.

Smokeless coals are firm at circular prices, and increased orders are being booked for the prepared sizes for July shipment. Mine-run has bettered, and a fair number of shipments are going forward at $1.25.

An increased number of orders have been placed for Hocking lump for July delivery. Some tonnage is moving for the harvest trade, and there is no free coal on the market.

Both Kentucky and West Virginia splints have been subject to price cutting. Block coal has been offered at as low as $1.15 and other sizes in proportion. A recent contract for splint is reported to have been made at a price considerably below that of last year for mine-run. Eastern Kentucky prices are most variable, and the market is not in good shape.

A slight increase was noted in anthracite buying toward the end of the month. The price disturbance in the East is evidently reaching Westward, and some concessions have been made by the independents to secure orders.

Quotations in the Chicago market are on about the following basis:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump......	$1.35@1.50	$1.25@1.35	$1.35@1.45	$1.25@1.35	$1.30@1.40
Steam lump	....	1.15@1.25	1.10@1.15	1.15@1.25	1.30
2½-in. lump.	1.15	....	1.25@1.30	1.20@1.30	1.30
1¼-in. lump.	....	1.25	1.15@1.20	1.15@1.20	....
Egg........	1.25@1.35	1.25@1.35	1.15@1.25	1.10@1.25	1.15@1.25
Nut........	1.10@1.25	1.05@1.15	1.00@1.10	1.00@1.10	1.00@1.05
No.1washed	1.35@1.50	....	1.50	....	....
No.2washed	1.25@1.35	....	1.40	....	....
No. 1 nut..	1.35@1.50	....	....	....	....
No. 2 nut..	1.20@1.35	....	....	....	....
Mine-run...	1.15@1.25	1.05@1.10	.85@1.00	.90@1.00	.85@1.05
Screenings..	.80@ .90	.75@ .85	.70@ .80	.65@ .80	.65@ .85

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump......	$1.25@1.35	$1.35@1.50	$1.90@2.00	$1.35@1.50	$1.35@1.50
1¼-in. lump.	1.10@1.25	1.15@1.50	....	1.10@1.25	1.25
Egg........	1.15@1.25	1.10@1.25	1.90@2.00	1.25@1.40	....
Nut........	....	.90@1.25	1.40	1.15@1.35	1.15@1.25
No. 1 nut..	1.25@1.35	....	1.25	....	....
No. 2 nut..	1.20@1.30	....	....	....	....
Mine-run...	1.10	1.00@1.10	1.10@1.25	1.15@1.25	1.15@1.25
Screenings..	.90@ .95	.70@ .85	....	1.00@1.05	....

INDIANAPOLIS

Trade on the full summer basis with prices and production at the minimum. Improved outlook in industrial circles.

Production is down to a minimum and prices at the summer level with the exception of screenings, which hold up to 80 to 90c., most buyers holding off, to see if they will not sag to last year's level. There is moderate buying of Eastern coals by the yards of this city, but not as much as usual is going into storage.

The industrial demand is slow, outside of those factories working on war orders. The steel business is improving, however, the Illinois Steel Co., at Gary, Ind., having this week put its last furnace in blast and the output being up to full capacity, for the first time since 1912. Wheat cutting is in progress and the thresher demand for lump coal will open next week. The usual channels for Indiana domestic lump are almost closed, with the appearance again of summer weather.

ST. LOUIS

Country trade expanding and market is taking on a slightly improved tone.

The market has taken on a slightly stiffer tone, but the improvement has not been sufficient to favorably affect prices. The country trade is reported better than the city, partly due to the threshing demand and partly to improved crop conditions. The country orders are for lump, egg and nut. Country mills are starting up or getting ready to start and that is helping a little also. The Big Muddy Co. announces that the Southern demand is picking up, due to dealers in that section taking advantage of the plentiful supply of cars at this season.

Dealers in this part of the country, where car scarcity is not so troublesome, do not begin laying in a supply until August. The demand for Standard screenings is a little better. Williamson and Franklin County No. 1 nut has gone up a little.

The market is now quotable on about the following basis:

	Wilm. & Frnk. Co.	Sparta	Mt. Olive	Standard
6-in. lump	$1.25@1.35	$1.25	$1.25	$0.90
2-in. lump	....	0.90	1.25	0.77½
3-in. lump	....	....	1.15	....
3x6 egg	1.25@1.35	....	....	0.77½@0.80
No. 1 nut	1.30@1.35	....	....	....
No. 2 nut	1.15	....	....	....
No. 1 washed	1.25@1.35	....	1.35	....
No. 2 washed	1.15@1.25	....	....	....
No. 3 washed	1.20	....	....	....
No. 4 washed	1.15	....	....	....
No. 5 washed	0.80	....	....	....
Screenings	0.80@0.85	....	0.77½	0.80

PRODUCTION AND TRANSPORTATION STATISTICS

PENNSYLVANIA RAILROAD

The following is a statement of shipments over the P.R.R. Co.'s lines east of Pittsburgh and Erie for May of the current year and the five months of 1914 and 1915, in short tons:

	May		Five Months	
	1915	1914	1915	1914
Anthracite	972,995	933,623	4,442,661	4,580,414
Bituminous	3,393,328	3,465,546	14,905,854	16,597,074
Coke	872,181	930,173	3,609,667	4,008,443
Total	5,238,504	5,329,342	22,958,182	25,185,931

SOUTHWESTERN TONNAGE

The following is a comparative statement of the Southwestern tonnage for April and the preceding three months:

	February		March		April	
State	1914	1915	1914	1915	1914	1915
Missouri	259,270	225,996	263,593	271,374	179,723	196,032
Kansas	492,304	492,320	501,841	522,242	378,192	410,565
Arkansas	113,354	102,451	165,037	90,252	87,002	80,118
Oklahoma	257,162	302,026	296,484	243,505	239,443	181,873
Totals	1,122,090	1,122,793	1,226,955	1,127,373	884,360	868,588

NORFOLK & WESTERN

Destination of shipments over this road for May of this year, the five months of this year and last year were as follows, in short tons:

	May		Five Months	
Coal	1914	1915	1914	1915
Tidewater, foreign	144,560	385,449	761,745	1,138,766
Tidewater, coastwise	336,958	262,281	1,652,101	1,314,290
Domestic	1,857,154	1,786,884	7,786,519	7,594,820
Coke				
Tidewater, foreign	....	5,605	15	8,564
Domestic	88,145	73,665	492,732	358,202
Total	2,426,817	2,513,884	10,693,112	10,414,642

NORFOLK & WESTERN RY.

The following is a statement of coal handled by the N. & W. Ry. during May and the past four months in short tons:

	February	March	April	May
Pocahontas Field	835,826	1,003,437	1,163,948	1,259,992
Tug River District	243,910	282,886	285,243	322,881
Thacker District	195,557	227,817	245,887	278,775
Kenova District	67,667	66,605	112,076	90,642
Clinch Valley District	129,193	144,031	138,970	144,576
Other N. & W. Territory	1,785	2,478	3,271	2,323
Total N. & W. Fields	1,473,938	1,727,254	1,949,395	2,099,189
Williamson & Pond Creek	58,101	48,052	55,311	84,086
All other railroads	88,982	129,446	195,845	251,339
Grand total	1,621,021	1,904,752	2,200,551	2,434,614

CAR SITUATION

The total surplus of coal and gondola cars on May 1 amounted to 105,852 and the shortage 73.

BALTIMORE & OHIO

The following is a statement of coal and coke tonnage moved over this system and affiliated lines during May and the previous two months:

	March		April		May	
	1915	1914	1915	1914	1915	1914
Coal	2,094,607	3,173,972	2,159,914	2,131,812	2,564,481	2,357,119
Coke	257,099	356,164	289,369	343,962	297,897	301,163
Total	2,351,706	3,530,136	2,449,283	2,475,774	2,862,378	2,658,282

FREIGHT RATES

I. C. C. No. 7036—Durham Coal & Iron Co. vs. Central of Georgia Ry. Co.

1. Rate on coke in carloads from Durham and Chickamauga, Ga., to Pacific coast terminals found unjustly discriminatory and unduly prejudicial to the extent that it exceeds the rate contemporaneously in effect to the same points from the Birmingham, Ala., district.

2. Minimum carload weight unreasonable when the cars in which the shipments are made are incapable of being loaded to that weight. Tariffs should provide that in such cases the marked capacity of the car used will govern.

I. C. C. Nos. 6618, 6666—Application of the Pennsylvania Co. under the Provisions of Section 5 of the Act to Regulate Commerce, as amended by the Panama Canal Act, concerning its interest in and operation of the Pennsylvania-Ontario Transportation Company.

Upon application of the Pennsylvania Co. and the Canadian Pacific Ry. Co. under the provisions of section 5 of the act to regulate commerce, as amended by the Panama Canal act, to continue their interest in and joint operation of the Pennsylvania-Ontario Transportation Co.; **Held:**

1. That the existence of through all-rail routes with joint rates applicable thereto in which the petitioners participate renders it possible for petitioners to compete with the boat line in which they are interested, within the meaning of the act.

2. Upon the facts of record the continued joint interest in and operation of the Pennsylvania-Ontario Transportation Co. by the petitioners herein is in the public interest and will neither exclude, prevent, nor reduce competition on the route by water under consideration.

FOREIGN MARKETS

GREAT BRITAIN

Export trade demoralized by the restrictions. Fears expressed of losing trade to South America.

June 18—The coal industry continues to be very seriously disturbed by the newer of the various abnormal factors which are now affecting it. The export regulations are making business very difficult in the shipping centers because of the refusal of so many licenses for exports to neutral countries. Exporters state that it is quite useless to attempt to obtain licenses for South America in particular, while it is growing harder to secure the sanction of the export committee for shipments to coaling stations and elsewhere, licenses being only given in special circumstances. Efforts on the part of the chambers of commerce and influential exporters to secure a modification of the restrictions have had no result. Many colliery owners in South Wales and elsewhere find themselves faced with growing stocks, and it is feared that instead of decreasing home prices, the only effect of the severity of the regulations will be to close down collieries. It is also pointed out that American coals are pouring into Brazil, the Plate, Argentine and Uruguay, and that it will not be easy to get the business back again. The possibility that the Board of Trade may fix a maximum price is also retarding inland business.—"The Iron and Coal Trade Review."

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principals in the coal trade.

✚Indicates contracts regarding which official information has been received.

Recast

In the following table we give a list of all old contracts coming up for consideration during the ensuing week. The table gives our contract number, the name of the purchaser, city, tonnage and page, all in Vol. 7, on which the detail notice appeared.

No.	Purchaser	City	State	Tonnage	Page
869	Board of Education	Washington	Penn.	25,000[1]	1086
895	County Commissioners	Monticello	Ind.		1086
914	Board of Education	Fort Dodge	Iowa		1126
921	County Commissioners	Rensselaer	Ind.	400	1127
927	County Commissioners	Shelbyville	Ind.		1127
931	Board of Education	Sharon	Penn.		1127

[1] Bushels.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

No. 598—New Orleans, La.—It is said that the United Fruit Co. is in the market for approximately 100,000 tons of coal for use on steamers operating out of Mobile and New Orleans to Central and South American points. Previous contract of this company was run in Vol. 7, p. 794. Address Purchasing Agent, United Fruit Co., New Orleans, La.

✚No. 843—Columbus, Ohio—Bids have been received on this contract (Vol. 7, p. 1049), which provides for furnishing the local county buildings with coal as follows: Fletcher-Williams Coal Co., Hocking mine-run, $1.59 at infirmary switch and $1.89 to the court house, morgue and Memorial building; M. A. Suydam & Co., Pomeroy, W. Va., mine-run, $1.95; Peacock Coal Co., same, $1.60 a ton at infirmary switch; J. Rapp & Co., court house, morgue and Memorial building, $1.90 and at infirmary switch, $1.65; Taylor-Williams Coal Co., West Virginia, Island Creek mine-run at court house and memorial hall, $2.11, at county morgue, $2.21 and at county infirmary switch, $1.74; Homer Gill, Hocking mine-run $1.70 at infirmary switch and at court house, memorial hall and morgue, $2.15; Elk Coal Co., Cedar Point mine-run at infirmary switch $1.70 and Hocking mine-run at infirmary switch $1.55; Lorain Coal & Dock Co., Island Creek, W. Va., mine-run $1.70 at infirmary switch; Victoria Coal Co., Hocking mine-run at infirmary switch $1.57½, West Virginia mine-run at infirmary switch $1.65; New York Coal Co., Hocking mine-run at infirmary switch $1.70; Maynard Coal Co., Pomeroy mine-run at infirmary switch $1.70; Maple Hill Coal Co., West Virginia mine-run at infirmary switch $1.85; Hocking Valley Products Co., Hocking mine-run at court house, Memorial building and morgue $2.03 and at infirmary switch $1.69; Franklin Builders Supply & Coal Co., West Virginia mine-run $2.17 delivered and Ohio mine-run $2.04 delivered. Address Clk. John Scott, Bd. of County Comrs., Columbus, Ohio.

✚No. 856—Kansas City, Mo.—This contract (Vol. 7, p. 1085), which provides for furnishing the local Board of Education with approximately 7000 tons of semianthracite and bituminous coal, will be awarded about July 15. Address Pur. Agt. F. S. Casey, Bd. of Edu., Kansas City, Mo.

No. 934—Worcester, Mass.—This contract (Vol. 7, p. 1127), which provides for furnishing the various public buildings at this place with coal during the ensuing year was bid on as follows: Anthracite, F. E. Powers Co., $6.79; Peoples Coal Co., $6.75; C. K. Smith Co., $6.94; O. G. Hedlund Co., $7.02. Bituminous (with a B.t.u. value ranging from 14,000 to 14,300), F. E. Powers Co., $4.70; Claflin-Summer Co., $4.79 or more; Peoples Coal Co., $4.57 or more; O. G. Hedlund Co., $4.84 or more. Address Supt. of Public Buildings George C. Halcott, Room 35, City Hall, Worcester, Mass.

New Business

✚No. 943—Wescoesville, Penn.—The Directors of the Poor of Lehigh County will receive bids until 2 p.m., on July 5, for furnishing the County Home with 1200 tons of bituminous and 200 tons of anthracite chestnut coal during the ensuing year. Bids should specify clearly what kind of coal it is proposed to furnish, and prices quoted should be f.o.b. cars at 17th and Gordon St. siding, Allentown, Penn. Address County Controller Cyrus J. Dilcher, Allentown, Penn.

No. 944—Chicago, Ill.—The Brighton Foundry Co. purchases a few cars of Illinois or Indiana mine-run from time to time. It will be in the market for one or two cars about Aug. 1. Address Purchasing Agent, Brighton Foundry Co., Chicago, Ill.

No. 945—Chicago, Ill.—Butler Bros. will be in the market about Aug. 1 for 2500 tons Illinois or Indiana screenings; also 2500 tons Illinois or Indiana egg or nut. The contract is let to May 1, 1916. Address Purchasing Agent, Butler Bros., Chicago, Ill.

No. 946—Chicago, Ill.—The Artesian Stone & Lime Works will purchase three cars of Pocahontas mine-run about Aug. 1. Address Purchasing Agent, Artesian Stone & Lime Works, Chicago, Ill.

✚No. 947—Towson, Md.—The Maryland State Normal School received sealed bids until 11 a.m., June 26, for furnishing 800 gross tons of Georges Creek Big Vein coal. Bids were to include cost of delivery in the bins of the power house. Address Secy. M. Bates Stephens, State Bd. of Edu., Annapolis, Md.

No. 948—North Vernon, Ind.—The Coöperative Enterprise Glass Co., at this place, purchases about 500 tons of good steam coal per annum. The present contract expires Aug. 1 and deliveries are at the rate of one car per month. Mine-run coal is required. Address Pres. Thomas P. Finnerty, Coöperative Enterprise Glass Co., North Vernon, Ind.

No. 949—Chicago, Ill.—The Acme Malting Co., of this place, will be in the market about Aug. 1 for two cars per week of Indiana mine-run coal. Address Pur. Agt. W. P. Rice, 4501 Cortland St., Chicago, Ill.

✚No. 950—Linden, N. J.—The Board of Education in this district will receive bids until 8 p.m., July 14, for furnishing about 200 tons of anthracite, pea, and nut coal. All bidders are required to furnish a certified check for one-quarter of the amount of the bid. Deliveries are to be made as required. Address District Clk. Thomas H. Keys, Bd. of Edu. School No. 1, Wood Ave., Linden, N. J.

✚No. 951—Knoxville, Tenn. — A committee has been appointed by the Board of Education to receive bids for the coal supply during the season of 1915 and 1916. The contract last year amounted to about $3000, and it is estimated that it will be even more this year. Address Fred W. Keith, Knoxville, Tenn.

✚No. 952—Fairport, N. Y.—The Fairport Municipal Commission will be in the market about Aug. 1 for approximately 2000 tons of bituminous mine-run coal. It is understood that the business is not let on competitive bids. The customary price is $2.75 per ton. Address Supt., C. J. Sullivan, Fairport Municipal Commission, Fairport, N. Y.

No. 953—Lynn, Mass.—The Board of Education at this place usually contracts for its annual fuel requirements about Aug. 1. The business last year was done on the following basis: 2057 tons New River coal at $4.20; 833 tons egg coal and 57 tons of stove at $6.75; 292 tons broken, $6. The call for bids is advertised. Address City Purchasing Agent, City Hall, Lynn, Mass.

✚No. 954—Port Gibson, Miss.—The Light & Water Department at this place usually contracts about Aug. 1 for approximately 1600 tons of Kentucky lump coal, which usually costs $3 per ton delivered. Business is let on competive bids. Address H. D. Brownlee Light & Water Department, Port Gibson, Miss.

No. 955—Manistee, Mich.—The Manistee Flouring Mill Co. at this place, usually contracts for their coal supply about Aug. 1. The company has lately been equipping its mill with electricity, so that their coal requirements will be materially reduced. Address Pres. G. A. Hart, Manistee Flouring Mill Co., Manistee, Mich.

No. 956—Petersburg, Ill.—The Abbott Light & Power Co., at this place consumes approximately 3200 tons of screenings per annum. Their contract expires about Aug. 1, and the business is let on competitive bids. The contract for the past year was at about $1.25 per ton. Address B. Hubbard, The Abbott Light & Power Co., Petersburg, Ill.

+No. 957—Xenia, Ohio—The County Commissioners at this place will receive bids until 10:30 a.m., July 3, for furnishing coal as follows: Court House 200 tons; Greene County Library 50 tons; Infirmary Home 300 tons; County Jail, Pocahontas mine-run 35 tons. The supplies for the Heating Plant, Library and Jail are to be delivered in the bins and that for the Infirmary Home on side track convenient of access. One half the deliveries are to be completed before Sept. 1, and the balance before Feb. 1, 1916. Address County Commissioners, Court House, Xenia, Ohio.

+No. 958—Washington, Ind.—The Electric Works at this place usually contracts about Aug. 1 for their annual requirement of coal involving about 5000 tons. Mine-run coal is required and the usual price is about $1.37 per ton delivered in the bins. The business is done on a competitive basis. Address The Electric Works, Washington, Ind.

+No. 959—Wenatchee, Wash.—The Local School Board received bids until noon, July 2 for furnishing 140 tons of coal. Bids are requested both f.o.b. cars at Wenatchee, and delivered in bin. Specifications may be obtained on application. Address Clk. Theresa Unger, Bd. of Edu., Wenatchee, Wash.

+No. 960—Harriman, Tenn.—The Harriman Water & Light Department usually contracts about Aug. 1 for their annual requirements of coal involving approximately 2160 tons. Middle Creek, Tenn., coal is ordinarily used, and the price is about $1.35. It is understood the business is not let on competitive bids. Address R. Walzl, Harriman Water & Light Dept., Harriman, Tenn.

No. 961—New York, N. Y.—Bids will be opened at 2 p.m., July 6, by the College of the City of New York, for furnishing and delivering 4800 gross tons of No. 3 buckwheat and 1600 tons, of semibituminous mine-run at Amsterdam Ave. and 139th St. Particulars may be obtained on application. Address the Curator of the College, Room 114, Main Building, 139th St. and Convent Ave., New York City.

+No. 962—New Orleans, La.—The New Orleans Butchers' Abbattoir, at this place, are testing samples of steam coal and will contract for their annual supply some time during the current month. Address New Orleans Butchers' Abbattoir, North Peters and Alabo St., New Orleans, La.

+No. 963—Aberdeen, S. D.—The Board of County Commissioners at this place will receive bids until 2 p.m., July 6 for furnishing the coal requirements for the Brown County House, Poor Farm, and County Poor during the ensuing year. Bids are requested on Kentucky block, Pocahontas and lignite coal. Address County Audr. J. C. Daly, Bd. of County Comrs., Aberdeen, S. D.

+No. 964—Breckenridge, Penn.—Sealed proposals will be received until July 6 for furnishing the local public schools with screened and mine-run Bull Creek coal. Address Secy. John W. Girt, Breckenridge Borough Public Schools, Breckenridge, Penn.

+No. 965—Kent, Ohio—Sealed bids will be received by the local Board of Education until 8 p.m., July 6, for the delivery of approximately 220 tons of three-quarter screened bituminous coal to the various school buildings. Address Clk. W. B. Andrews, Bd. of Edu. Kent, Ohio.

+No. 966—Pineville, La.—It is understood that the State Hospital for the Insane at this place will contract in the near future for their fuel requirements during the ensuing year. About 12,000 tons will be required. Address Supt., State Hospital for the Insane, Pineville, La.

No. 967—Aspinwall, Penn.—Sealed bids were received by the local City Government until 7:30 p.m., July 3, for furnishing the pumping station with coal as required during the ensuing year. Quotations are made f.o.b. Aspinwall Pumping Station, and bidders were required to give the name of the mine from which the coal used is to be shipped. About 100 tons a month of nut, nut and slack, and slack coal will be required. Address Borough Clk., S. R. Chase, 230 First St., Aspinwall, Penn.

+No. 968—Van Wert, Ohio—Sealed bids will be received by the local Board of Education until noon, July 6, for furnishing the various school buildings with approximately 400 tons of coal. Quotations are to include cost of delivery into the buildings as required. Bids are requested on Hocking ¾-in. screened, West Virginia mine-run, three-quarter and 5 in. screened. Address Clk. J. M. Showalter, Bd. of Edu. Van Wert, Ohio.

+No. 969—Hillboro, N. D.—The County Commissioners at this place will receive bids until 10 a.m., July 15, for furnishing approximately 200 tons of Georges Creek smokeless or lignite coal, deliveries to be made in carload lots at the Court House, during the period Oct. 1 of the current year to May 1, 1916. Address County Audr. Nels O. Lindaas, Bd. of County Comrs., Hillsboro, N. D.

No. 970—Gretna, La.—The American Cotton Oil Co. at this place are said to be in the market for their supply of steam coal. Address American Cotton Oil Co., Gretna, La.

+No. 971—Liberty, Ind.—The Board of Education at this place will receive bids until July 9 for 150 tons of Winifrede coal. Address Secy. F. T. Dubois, School Trustees, Liberty, Ind.

+No. 972—Chicago, Ill.—The United States Gypsum Co., is reported to be in the market for 300 tons of fuel coke per month during the ensuing year. Address Purchasing Agent, United States Gypsum Co. 205 W. Monroe St., Chicago, Ill.

+No. 973—St. Cloud, Minn.—Sealed bids will be received by the Board of Education at this place for furnishing approximately 300 tons of bituminous coal deliveries to be made on or before Aug. 3, at different buildings. Deliveries are requested on Fairmont nut, Youghiogheny screened lump, run apile, Hocking screened lump, run apile and nut. Address Secy. Julius Adams, Bd. of Edu. St. Cloud, Minn.

+No. 974—Muscatine, Iowa—The Board of Education at this place will receive bids until noon July 6, for furnishing and delivering approximately 800 tons of coal to the various school buildings during the ensuing year. All the coal is to be four- to six-in. lump which is to be unloaded with forks and the residue delivered to buildings heated with boilers. Address Chn. Charles Ruthenberg, Fuel & Light Com., Bd. of Edu., Muscatine, Ia.

+No. 975—Lake Benton, Minn.—The City Government here will receive bids until 7 p.m., July 6, for furnishing a car of Youghiogheny coal to be delivered at the pump house. Address Village Recorder E. M. Kimball, Lake Benton, Minn.

No. 976—Salem, S. D.—Sealed bids will be received by McCook County until 2 p.m., July 6, for furnishing various kinds of bituminous coal. Quotations should be made f.o.b. Salem. Address County Audr. C. F. Erickson, Salem, S. D.

+No. 977—Brazil, Ind.—The Board of Education at this place received bids until July 2 for furnishing approximately 1000 tons of screened coal for the local school buildings. Address Secy. H. D. Falls, Bd. of Edu. Brazil, Ind.

No. 978—Kansas City, Mo.—The American Sash & Door Co., at this place, which is now buying its coal in the open market, is reported to be considering a proposition to contract for its requirements. They consume about 80 tons of bituminous coal per week. Address Purchasing Agent, American Sash & Door Co., Kansas City, Mo.

+No. 979—Mitchell, S. D.—The City Government will receive bids until 8 p.m., July 6, for furnishing about 550 tons during the ensuing year. Deliveries are to be made as required. Bids are requested on Pocahontas mine-run, Youghiogheny, screened lump and Matilda lump and should be made f.o.b. cars, Mitchell. Address City Audr. Thomas Eastcott, Mitchell, S. D.

No. 980—Kansas City, Kan.—The National Zinc Co. expects to be in the market soon for its annual coal requirements for the year beginning Sept. 1. They ordinarily use Cherokee slack and mill coal. The plant is at Argentine, a suburb of Kansas City. Address Purchasing Agent, National Zinc Co., Kansas City, Kan.

+No. 981—Bloomsburg, Penn.—The Board of Education is receiving bids for their annual fuel requirements amounting to 300 tons of No. 6, 50 tons of buckwheat and 25 tons of No. 4. Address Chn. C. L. Pensyl. Supply Com., Bloomsburg, Penn.

No. 982—Sheffield, Mo.—The Kansas City Bolt & Nut Co. is requesting bids to furnish their annual fuel requirements amounting to about 10 cars. Address Treas. H. K. Warren, Kansas City Bolt & Nut Co., Sheffield, Mo.

+No. 983—Washington, Kan.—The County Commissioners will receive bids until noon, July 8, for furnishing 110 tons of screened Cherokee coal to be delivered in bins at the Court House and Jail. Address County Clk. F. C. McKelvy, Washington, Kan.

No. 984—Kansas City, Mo.—The Smith & Sons Mfg. Co., of this place will contract some time during the current month for 12 cars of slack coal to be delivered during the ensuing year. Address S. F. Smith, Lydia & Guinotte Aves., Kansas City, Mo.

+No. 985—Washington, D. C.—It is unofficially understood that the Navy Department is negotiating orders aggregating

45,000 tons of coal to be delivered for bunkering purposes through Philadelphia. Address Paymaster General of the Navy, Samuel McGowan, Washington, D. C.

+No. 986—New Orleans, La.—The Sewerage & Water Board of New Orleans will contract in August or September for their annual supply of steam coal amounting to between 10,000 and 18,000 tons. Address A. V. Wertz, Sewerage & Water Board, New Orleans, La.

No. 987—Kansas City, Mo.—The Witte Iron Works Co. at this place, which uses about 15 cars of Cherokee mill coal per year, are said to be considering a contract instead of buying in the open market as they now do. The plant is at Centropolis, Mo. Address Purchasing Agent, Witte Iron Works Co., Kansas City, Mo.

+No. 988—Atlantic City, N. J.—The Government engineer will receive bids until July 12 for furnishing about 3000 tons of bituminous coal for delivery at this place. Complete information may be had on application. Address U. S. Engineer Office, Wilmington, Del.

+No. 989—Frankfort, Ky.—The State Board of Control for Charitable Institutions will receive bids until noon, July 9, for furnishing coal during the fiscal year beginning July 15. These grades will be required: Eastern State Hospital at Lexington, mine-run; Central State Hospital at Lakeland, nut and slack; Western State Hospital at Hopkinsville, nut and slack and pea and slack; Kentucky Institute for Feeble-Minded Children at Frankfort, nut and slack. The contract will be let on a heat unit basis, and all bids must be submitted on blank forms, which may be obtained on application. Address Kentucky State Board of Control for Charitable Institutions, Capitol, Frankfort, Ky.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

No. 205—Norristown, Penn.—This contract (Vol. 7, pp. 400, 626), which provides for furnishing the local School Board, has been awarded to **Bodey & Solomon** as follows: 150 tons stove, $6.15; 25 tons egg, $5.90. Metzger & Son obtained a contract for 115 tons of pea at $4.35. The award of 200 tons of bituminous coal was not made because it could be bought to a better advantage in the open market. Address Secy. Harry W. Akins, 717 DeKalb St., Norristown, Penn.

+No. 624—Providence, R. I.—This contract (Vol. 7, pp. 795, 1126), which provides for furnishing the Board of Education with about 8500 tons of anthracite coal, has been awarded to the **Robert E. Smith Co.** at $5.98 for Highland egg and $6.23 for chestnut. Address Secy. Henry B. Rose, Public School Dept., 32 Summer St., Providence, R. I.

+No. 735—Davenport, Iowa—This contract (Vol. 7, p. 917), which provides for furnishing the Board of Education with about 2900 tons of coal, has been awarded as follows: **Denger Bros.**, Springfield lump, $2.68; 2-in. Harrisburg screenings, $2.28. **Rock Island Fuel Co.**, 6-in. egg, $2.65. Address Secy. J. D. McCollister, Bd. of Edu., 1144 Main St., Davenport, Iowa.

No. 760—New Bedford, Mass.—This contract (Vol. 7, p. 955), which provides for furnishing the Board of Education with 2600 tons of egg and stove coal, has been awarded to **F. T. Akin & Co.**, at $6.84 per ton. Other bids on the contract were: Patrick Connor, $7.95; Dennison Bros. Co., $6.98; City Coal Co., $6.90. Address Clerk, Chas. P. Sawyer, Committee on Fuel, City Council, William St., New Bedford, Mass.

+No. 842—Columbus, Ga.—This contract (Vol. 7, p. 1049), which provides for furnishing the local schools with coal during the ensuing year, has been awarded to the **Acton Coal Co.**, on Margaret lump coal at $1.80 per ton f.o.b., Columbus, Ga. Address Supt. R. B. Daniel, Public Schools, Columbus, Ga.

+No. 849—Dorchester Center, Mass.—This contract (Vol. 7, p. 1049), which provides for furnishing the State Hospital with 275 tons of anthracite coal, has been awarded to **D. Doherty Co.**, on assorted sizes at $7.19 per ton. Address Henry Lafavour, Finance Com., Boston State Hospital Commission, Dorchester Center, Mass.

+No. 882—Tracy, Minn.—This contract (Vol. 7, p. 1086), which provides for furnishing the local Board of Education with coal during the year beginning July 1 has been awarded to **Rialson & Son** on Youghiogheny lump at $5.55 per ton delivered at the School Buildings. Address Clk. C. C. Richard, Bd. of Edu. Tracy, Minn.

+No. 897—Lyndhurst, N. J.—This contract (Vol. 7, p. 1087), which provides for furnishing the local Board of Education with about 90 tons of egg and 250 tons of pea coal, has been awarded to **Wm. H. Wurdemann** at $4.49 for pea and $6.25 for egg. O. Kiesewette & Co. bid $4.80 for pea and $6.30 for egg and Jesse P. Joralemon bid the same. Address Wm. J. Liston, Bd. of Edu., Lyndhurst, N. J.

+No. 960—Liberty, Ind.—This contract (Vol. 7, p. 1087), which provides for furnishing the Municipal Government with about three cars of Island Creek mine-run coal, has been awarded to **C. A. Ward** at $2.80, delivered at the Water Works. W. H. H. Clark & Son bid $3.10. Address Town Clk. R. M. Duvall, Liberty, Ind.

No. 926—Detroit, Mich.—This contract (Vol. 7, p. 1127), which provides for furnishing the Police Department with its fuel supply, has been let to the **United Fuel & Supply Co.**, at $6.49 for stove and egg coal, and $6.74 for chestnut. Address Asst. Secy., Howard Whelan, Metropolitan Police Dept., Detroit, Mich.

+No. 929—New Orleans, La.—This contract (Vol. 7 p. 1127), which provides for furnishing the Charity Hospital with about 6000 tons of coal during the ensuing year, has been awarded to **F. S. Walshe,** of the Tennessee Coal & Iron Co. Address Hon. Chas. A. Farwell, Charity Hospital, New Orleans, La.

Contract Notes

Davenport, Ia.—Denger Bros. of Davenport and the **Rock Island Fuel Co.** have been awarded contracts for supplying coal to the Davenport Public Schools.

Chicago, Ill.—Much favorable comment is heard regarding the manner in which the operators' association in Illinois has been maintaining prices in the face of the recent dullness.

Terre Haute, Ind.—The Acme Coal & Lime Co. of this city secured the contract for coal for the schools for next school year, at $1.98 a ton for Greene Valley, No. 4, 1½-in. shaker rescreened coal.

Tappen, N. D.—The Board of Education at this place will receive bids until July 12 for delivery of coal at the coal shed of Tappen School, District 28. Address, Clk. James McKee, Bd. of Edu., Tappen, N. D.

Lowell, Mass.—The mill of Wm. E. Walsh at this place consumes about 300 tons of New River coal per annum, which is delivered by wagons from the railroads. The mill has a storage capacity of 50 tons.

Greenville, Penn.—The School Board at this place will receive bids until July 5 for hauling coal from Canon & Miller and Zuschlag coal banks to the 14 school houses located in the district. Address, Secy. I. C. Brown, School Bd., Greenville, Penn.

Buffalo, N. Y.—The bids for supplying coal to the county institutions were opened by the Board of supervisors on June 25 (p. 957). They are quite complicated and are in several divisions, and it will require sometime to determine the lowest bidder.

Pottstown, Penn.—The contract for supplying the public schools at this place has been awarded as follows: 320 tons of pea at $4.60 and 50 tons of broken $5.75 to **J. H. S. Griess & Co.**; and 150 tons of bituminous coal at $3.25 to Hatfield & Hilles.

Spain—An American consular officer in Spain reports that a business man in his district desires to import coal. Prices and full information should be sent at once. He desires to receive quotations c.i.f. destination, otherwise f.o.b. New York. Correspondence may be in English. References are given.

Chicago—The American Can Co. has placed contract with the **Consolidated Indiana Coal Co.** for fifty per cent. of its requirements of screenings for next year at its four plants, located in Chicago, Maywood and Joliet. It is understood that the contract covers Hymera Fifth Vein screenings at 75c. per ton at the mines.

Milton, Ky.—Local coal yards in this river town are filled to capacity for the first time in months. The dealers, the Trimble Milling Co., and J. P. Strother are all reported to be stocked up with enough coal to last for perhaps a full year. The coal at this point is unloaded from the barges into wagons with a steam shovel and a steam winch is used in assisting the teams up the levee slope.

Knightstown, Ind.—The contract for furnishing the Indiana Soldiers' & Sailors' Orphans' Home at this place, regarding which an item was run on p. 1088 of Vol. 7, has been awarded to **Walter Bledsoe & Co.**, on No. 4 Linton mine-run coal at $1.80 per ton. The coal furnished by the Ohio & Kentucky Coal Co. who had this contract during the past year gave excellent results but it is computed that $900 per annum is saved by using the local product although this latter does make more ash and clinkers and is not so desirable to burn. Address Steward F. F. Boltz, The Indiana Soldiers' and Sailors' Orphans' Home, Knightstown, Ind.

COAL AGE

Vol. 8 NEW YORK, JULY 10, 1915 No. 2

A Personal Inventory

ONCE A YEAR or once in six months we take an inventory. We enter plant, equipment, supplies, etc. We deduct expenses, debts and depreciation. We endeavor to miss no asset or liability.

If our latest balance sheet shows that our credits are not growing, we decide there is something wrong with our methods, and we seek a remedy.

That's all very well and just as it should be; but—

How about taking a personal inventory?

How much of good-will have we been able to secure in the last six months? It is a valuable asset.

How much of co-operation? It is a resource.

Have we earned the respect and fidelity of our men? Do they support us?

How much of ill-will have we aroused? It is a liability.

How much of antagonism? It is a definite loss.

If we have earned the contempt and ill-will of our employees, there is something wrong with our methods. If our personal debts are growing faster than our personal credit, we need to adopt another system.

In the routine of business we of course acknowledge such things as checks sent us to pay for cars of coal, but do we acknowledge and show appreciation for the many little expressions of loyalty and faithful service on the part of employees? Without loyalty and efficient service we won't have cars of coal to sell.

We pay good money for advertising to promote confidence and increase trade. Do we deal frankly and openly with our men to secure the confidence which must precede honest, efficient and cheerful service?

We fill all our contracts with dealers to the letter. Has our treatment of the lowly trapper-boy been just as square?

A small item? So is postage, but we can't run our business without postage stamps.

The next time we inspect our plant let us take a look at ourselves. Perhaps we can find a way—quite simple and often overlooked — whereby we can improve the morale of our working organization.

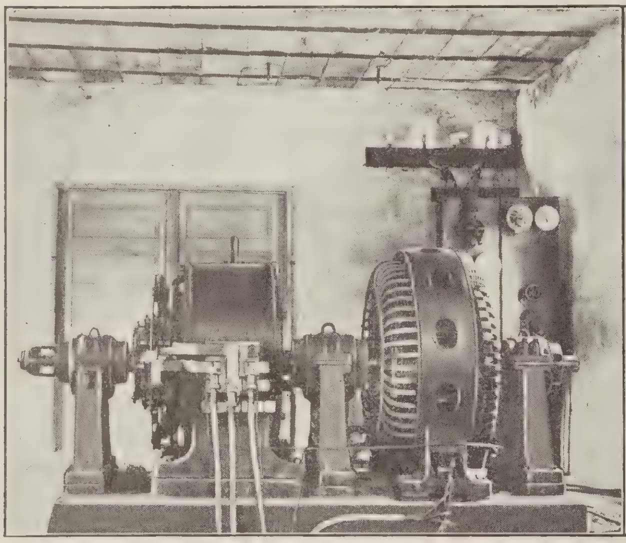
Written by GEO. N. LANTZ, *New Straitsville, Ohio*

Economics of the Central Station in Coal Mining

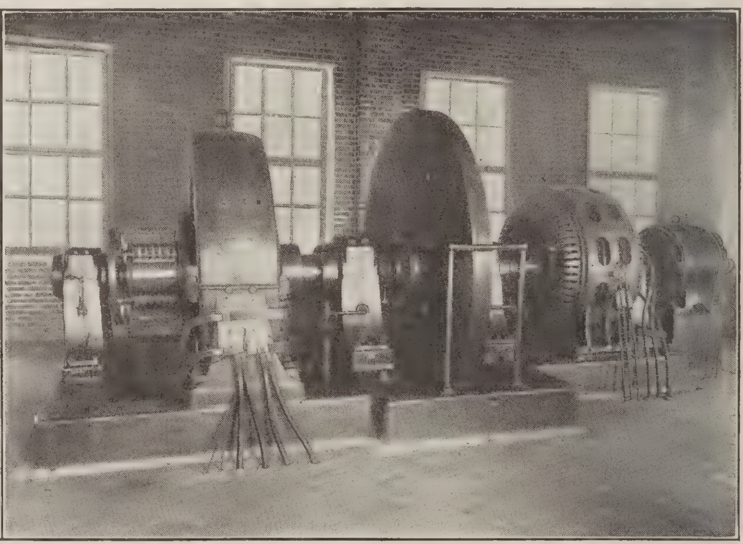
By T. R. Hay*

SYNOPSIS—Coal operators in the majority of cases do not know what their power costs or should cost. Consequently they regard central-station service with an indifference which may be dispelled only by the submission of a proposition for current. The preparation of a power contract usually reveals conditions and practices previously unsuspected.

Coal operators are finding it increasingly imperative to reduce the cost of mining and are consequently seeking ways and means of accomplishing this result. The labor cost of coal production is increasing, and consequently operators are investigating other items entering into the expense of coal production and analyzing them, with the view to discovering possible leakage.



A 150-KW. WESTINGHOUSE THREE-BEARING MOTOR-GENERATOR SET



AN ALLIS-CHALMERS FLYWHEEL MOTOR-GENERATOR SET

The average coal producer believes that he is securing his power at a low cost, since his fuel is cheap, his apparatus simple and his overhead charge for buildings low. Fuel at the mines costs of course whatever it will bring in the market. On the other hand, the question of water supply may be serious, as bad water may necessitate heavy and frequent renewals.

The boilers, engines and generators used at mines are, generally speaking, of the simplest type. Reliability is the primary requisite, and with the unskilled or semiskilled help available, this can be obtained only with simple equipment. It will generally be found that power costs are capable of material reduction by the introduction of scientific and uptodate methods of generation, distribution and application. It is here intended to discuss the general features or elements entering into the cost of power both from the point of view of the central station and of the coal operator.

As a general rule accurate and complete cost records are not available at mines, and until something goes wrong the power plant is usually regarded as the least important part of the operation. When the subject of central-station power is first broached the general attitude of coal operators is one of indifference, and this feeling can be overcome only by the submission of data based on actual operating tests. This if properly arranged will usually act as a challenge to the operator to disprove the conclusion reached.

Unsuspected Conditions Will Probably be Found

The collection of this data will usually reveal conditions before unsuspected and will lead to a study of power-application of great benefit to the coal operator.

If the results of the investigation make consideration of central-station service advisable, a detailed investigation of existing power costs as well as methods of application should be made. Full consideration must be given to the cost of application in central-station service and the specific advantages to be derived therefrom. By the use of recording watt-hour and demand meters, together with a record of the tonnage, the total consumption, maximum demand and power requirements per ton of coal mined may be obtained. This data will afford a means of comparison of central-station service and isolated-plant operation and may be used as a basis of further estimate.

In selecting the equipment necessary in order to enable central-station service to be used most economically, it should be borne in mind that it is desirable to have as little machinery as possible operated by direct current, as such operation increases the losses due to transformation of the central-station supply.

A plant operated partly by steam and partly by central-station power is ordinarily not advisable. Consequently all steam equipment should be changed to electrical. This

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condition necessitates that fans, pumps and other steam-driven equipment should be converted into alternating-current motor drive, while rotary converters must be installed for supplying direct current to the machinery inside the mine.

Before committing himself to the adoption of central-station power the operator should convince himself by a thorough investigation that the change will bring about justifiable economy. Consideration should be given to the estimated saving in dollars and cents as well as to the investment required to secure this saving. The life of the mine, the location and competitive features of the available market, the value of the coal, conditions of mining, general reputation of the company furnishing power as to continuity of service, the plans for future development of the existing operations and the possibility of later additions, as well as other related features of the operation, should be given due consideration before any investment or changes are made. Regard should also be had for the general features of attendance, operation and control, also to the flexibility and adaptability of electrical equipment to the severe conditions encountered in coal-mining work.

Replacing Perfectly Good Apparatus with New

The contention is usually made that a change of power supply necessitates disposing of existing equipment and that it does not seem reasonable to replace apparatus in good condition with new. If proper depreciation on the old apparatus has been charged against it, its value as carried on the books should be small, and if the proper method of bookkeeping has been employed and a certain percentage charged against the original purchase price of the equipment for each year of operation, the original cost will have been in large measure liquidated and the interest due to this investment can be charged off as practically zero.

In case the operator is unable to make the financial outlay necessary, but desires to use central-station energy, the power company may purchase and install the necessary equipment, operating it on a rental basis until such time as the original cost, together with accrued interest, shall have been liquidated, after which the apparatus shall become the property of the coal operator. If this method is not followed, the charge to the operator for his power may be of such an amount as to cover the cost of the power and also to liquidate the original cost and accrued interest of the operator's investment within a certain length of time, after which the rate may be reduced to that regularly charged other consumers coming under the same classification as the particular operation under consideration. This rate should be agreed upon when the contract is to be signed.

With many operators the cost of making a change from isolated-plant to central-station power forms a most formidable obstacle. While it is true that the fixed charges as included in the charge made by the central station would be present whether the power was generated locally or purchased, it will nevertheless usually be found that the fixed charge made by the central station is no greater and in many cases is less than when computed on the basis of a local plant.

Assuming that the charge in both cases is equal, it may nevertheless mean much for an operator whether he is obliged to finance an independent power plant or to pay the equivalent fixed charge on an investment made by the power company. The situation is analogous to the purchase or rental of property, and in any enterprise this difference may either greatly facilitate or handicap development. When money is hard to secure and can be obtained only at a high rate of interest, the availability of central-station service may be opportune by making possible developments that might otherwise be compelled to wait. Where the necessary capital is already available or can be readily obtained under favorable conditions, it should be remembered that all capital not needed for plant outlay may be used elsewhere.

The Question To Be Decided

It is immaterial to the consumer what may be the investment or overhead charges of the power company; the one question to be decided is whether or not power may be utilized more economically and satisfactorily when purchased from a central station than when generated locally. Many coal operations, both old and new, are finding it economically advisable to use central-station service.

Not one operator in ten knows what his power is costing him or what it should cost. Many plants erected during, say, the past 10 years were not designed or built with regard to efficiency or economy in operation, but merely to produce power to mine coal. With the advent of the central station in the coal-mining field, the inefficient and uneconomic operating characteristics of these plants were soon discovered, and it has often been found advisable to correct these faults by purchasing power, where the life of the operation would warrant this course.

In most cases the operator has a scant knowledge of what features enter into the sale of electricity as well as just what is contemplated by the contract. This proposition should be gone over in detail and a thorough explanation made of what is contemplated. The general rule followed by most central stations selling power to coal mines is the installation of instruments recording the kilowatt consumption and the demand.

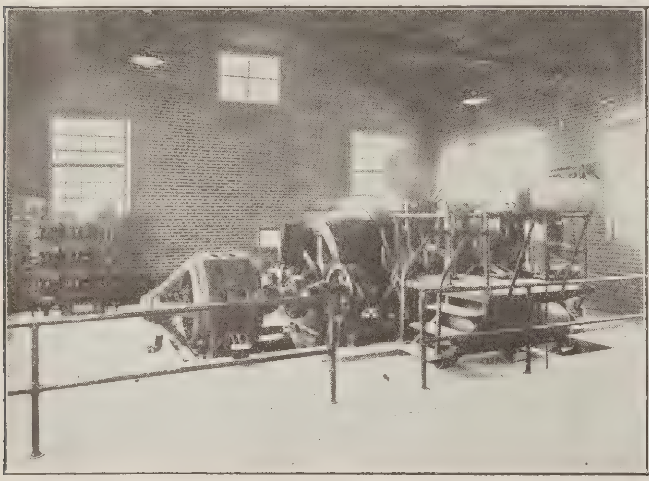
The basis of a power contract will be a minimum or primary charge which is necessary in order to protect the company in case of abnormal conditions, such as a strike or a more or less indefinite shutdown. The power company has a large investment in transmission lines, generating equipment, transformers, etc., and the fixed charge on this investment is continuous, whether or not the equipment is producing and delivering power.

The minimum charge, while perfectly reasonable from the central station's point of view, may not be readily understood by the average coal operator. A little logical reasoning and explanation should, however, readily convince the operator that all customers, in proportion, have to bear their indirect share of the central station's fixed charge. When abnormal conditions arise it is usual in most cases to arbitrarily reduce the minimum or primary charge by from 50 to 75 per cent. or else to provisionally cancel the existing contract, submitting for it a new and temporary contract based on the measured demand plus the usual charge for energy.

Determining the Maximum Demand

The proper method of determining the maximum demand, and consequently the minimum charge, is the subject of a wide diversity of opinion. It is sometimes based on the average of several integrated 5-min. peaks taken throughout a normal working day. Other companies prefer to figure this maximum demand from the result of the average integrated peaks of longer duration, say 10 to 15 min. The principal objection to this method of calculating the maximum demand is that the peaks may happen to be taken when conditions are not normal and hence may give erroneous results.

This method, however, of taking the 5-min. integrated peaks seem to be the best and most satisfactory one available. Its coefficient of error is not so large as to make any appreciable difference in the results. In some cases the primary, or minimum, charge may be based on the load factor, which is generally understood to be the ratio of the average load in kilowatts extending over an appreciable length of time to the manufacturer's nameplate rating of the equipment connected to the central-station service line, either direct or through transformers. These methods of estimating may be adjusted from time to time as agreed upon at the signing of the contract.



A 300-HP. 2300-VOLT ELECTRIC MINE HOIST AT GREENSBURG, PENN.

THE SWITCHBOARD IN LUZERNE SUBSTATION NO. 2, PUNXSUTAWNEY, PENN.

Actual figures obtained from existing installations show a fixed charge per kilowatt of demand for isolated coal-mine power plants varying from $12 per year in the large plants to $20 per year or more in the smaller ones. On this basis it does not seem unfair for the central station to make a fixed charge of $1 per kilowatt per month of demand plus a graduated charge per kilowatt of consumption, the final rate per kilowatt-hour to depend on the total power consumed.

Tests on different mines show a power consumption varying from 1.5 to 3.5 kw.-hr. per ton of coal mined, values higher or lower than those given being found, depending on the local conditions prevailing at the different mines. Knowing the current consumption per ton of output, the average cost per kilowatt-hour and the tonnage, it is possible to estimate, not only the total consumption, but also the cost for power per ton of coal mined.

Transformers Should Be Centrally Located

In order that the power may be applied efficiently and economically, the transforming equipment should be located as near the center of the load and distribution as possible. Since rotary transformers may be placed in any convenient point, this condition may be obtained at minimum expense and the set may be relocated from time to time so as to secure the most efficient arrangement.

If the cover is not too great, it is usually thought best to make a surface location for transforming equipment, taking the direct-current lines through bore holes to the selected point of distribution inside the mine. When a surface location is made, it should if possible be so located as to render unnecessary the devotion of the entire time of an attendant to its operation. A rotary transformer may also be located inside the mine, but such a procedure is not recommended because of the dirt, fire and water hazards, and also on account of its general inaccessibility. If so located, however, the equipment should be installed in a moisture- and fire-proof concrete room.

The economics of application will be largely determined by the conditions of roof and bottom, presence of water or gas, distances from the working face, main parting and pit mouth, fire hazard, attendance, etc. No set rule can be laid down, but each case should be thoroughly gone over and the application be made on the merits of the investigation. The general features of flexibility of movement and operation also apply to the stationary motor equipment and enable location of fans, pumps, etc., to be selected without reference to the boiler room, at the same time eliminating long lines of expensive and inefficient piping.

It is the general practice to use direct-current motor equipment inside the mine. As central-station power is supplied as alternating current, it is necessary to convert this supply to direct current. This may be accomplished by means of motor-generator sets or rotary converters. Synchronous equipment is often insisted on by the central station or a special discount given when used, or some other consideration made.

In some cases where power is supplied for use in a number of operations belonging to one company, it may be possible to locate one step-down transformer substation reducing transmission voltage to a potential suitable for distribution, say to 2300 volts, in such a manner as to serve the several operations. In this case the power company is usually willing to give an additional discount.

Selection of Converting Equipment Merits Care

Care should be taken in the selection of the rotary-converting equipment, the idea being to install machinery sufficiently flexible to enable that part in use to operate as near full-load conditions as possible. It may be found advisable to install a large and a small set, the former to take care of the day load and the latter to be used at night, the two being operated together on peak loads and under any unusual conditions that may occur.

If it is decided to use a motor-generator set, the initial investment may be capable of reduction on account of the possibility of using the old direct-current generators in the isolated plants as the direct-current elements of the motor-generator sets, either by belting or direct connection, preferably the latter. A direct-connected set is more efficient on account of the elimination of belt losses and requires less floor space than does a belted unit.

In determining the necessary capacity of the rotary-transforming equipment, alternating-current motors should be installed wherever possible. This may be done on such equipment as fans, hoists, pumps, slope hauls, etc. The use of alternating-current motors drawing power from the transmission line or from the secondaries of the high tension step-down transformers obviates conversion losses, thereby reducing the power bill to a minimum. It also reduces the size of the rotary transformer and the initial investment and acts to make the overall cost of operation a minimum.

Where it is necessary to use motors for hoisting, whether from shafts or slopes, the use of alternating-current machines throws the wide and sudden fluctuations of current and voltage onto the transmission line, where they are more easily taken care of than when a direct-current motor is used.

Inasmuch as the power is usually metered on the alternating side of the rotary transformer, a considerable saving in cost of operation can be made by having as little equipment as possible operated by direct current. This saving will usually be found to more than compensate the increased first cost of the installation. The steadier the direct-current voltage, the fewer the burnouts and the higher the efficiency of the equipment operated on the direct-current circuits.

Transmission and Distribution Should Be Efficient

The transmission and distribution systems inside of the mine should be as efficient as possible. It will generally be found that conditions here are capable of improvement by the exercise of care and attention, but it is a difficult matter to bring about this desirable state of affairs. As long as the equipment inside the mine operates and coal may be got out, little thought is given as to how much more cheaply or satisfactorily it might be possible to carry on this work if reasonable care and attention were given to the transmission and distribution circuits. Losses due to poor bonding and feeder-line construction may, and in many cases do, materially affect the efficiency and upkeep of the electrical equipment as well as the output of the mine and the power bill.

Where a motor-driven fan is employed, care should be taken in the location of the equipment, consideration being given for both present and future requirements. The amount of power that may be wasted through uneven or ununiform air passages and through allowing accumulations of rock on the floor of the airways may be considerable, while the saving that may be effected by keeping the passages clear more than justifies the expense.

When opening a new mine, it is usually advisable to employ a small fan motor, increasing its size when it becomes inadequate to perform the work required. Two-speed fans may be used when a small amount of air is necessary during periods of shutdown or at night and on Sundays, but care should be taken to select a motor that will have sufficient capacity to satisfactorily meet full-speed requirements.

Hoisting Should Be by Alternating Current

For shaft hoisting or slope haulage work it is usually advisable to use a variable-speed alternating-current motor. This type possesses features of design and construction that enable it to perform satisfactorily under the severe conditions imposed, and being alternating current it may operate independently of the direct-current equipment.

In some cases it may be desirable to use a direct-current motor for the hoist, in which case a suitable motor-generator set, either with or without a flywheel, may be employed. It is not generally advisable to attempt to convert an old steam-driven hoist to motor drive, as it will be found cheaper and more satisfactory to buy a new hoist equipment and sell the old one for whatever it may be possible to obtain.

Mine pumping is a desirable central-station load, since it is steady 24 hours per day. Pumping by electricity is more reliable and economical as well as more flexible than by steam or compressed air and acts to increase the operating-load factor of the installation. The equipment, furthermore, is self-contained and portable.

Sale of Power Requires Skill and Experience

The sale of power to coal mines on a mutually satisfactory basis necessitates a special knowledge and experience in this particular field. Patience on the part of the central-station representative is essential, as it requires time and detailed investigation to obtain the data and information to make possible the submission of an intelligent proposition.

Continuity of service, especially where pumps and fans are concerned, is essential. It is generally advisable, therefore, to employ the services of a competent consulting engineer when considering the advisability of using central-station service either as a substitute for locally generated power in a mine already open or in an entirely new operation. Many men who are able executives and efficient and successful in their own line of endeavor have met with trouble through their failure to recognize that the engineering and executive side of mining are totally different. Success can come only from a full recognition that expert advice based on long experience is essential to safety and efficiency in the production of coal.

The favorable development of a coal-mining load abounds in profits to the central station, particularly if it was primarily a lighting proposition, the increased load factor making it possible to sell power at a low rate. The great difficulty confronting the company first entering this field is a lack of information relative to the price at which it can afford to sell power. Any effort on its part to regulate the various peak loads according to its capacity in order to determine the rate, rather than by placing itself in a position to handle the demand of its customers under all conditions, can result only in uncertainty or confusion regarding the ultimate outcome. Installation of the necessary equipment on the principle of being a public servant rather than for the benefit of a single customer is the only safe method of determining what the traffic will bear.

Why Are Strikes at Coal Mines of Such Frequent Occurrence?--I

By Hugh Archibald*

SYNOPSIS—The first part of an answer to Mr. Le Baron's question as to the reason for so much strike turmoil in mining. The writer declares that the rate per ton paid to the miner is sufficiently high, but states that no one seems anxious to see that he is aided in producing a large output.

In the editorial in the issue of May 22 entitled "Can Someone Enlighten Mr. Le Baron," the question was asked whether there is any need for the continual strike turmoil in mining. In the final analysis it will have to be conceded that strikes are unnecessary.

Strikes instead of being biennial or triennial affairs in the different mining districts can be reduced to a negligible minimum. But to accomplish this a few ideas which are now considered excellent, but which are condemned because they are not considered as constituting "good business," will have to be recognized as working principles.

These principles are three: 1. Every man must earn a day's pay. 2. Every man desires to live decently, and his scale of living rises with his ability to pay for it. 3. Nothing exists without a cause, and the United Mine Workers of America would not exist if there was no need for it. These things are so tied up with each other that a discussion of them almost runs around in a circle, and the end of the argument depends on the point of beginning. But there are changes to be made before peace will settle over coal mining—a peace that is possible and would be advantageous to the operators and to the workmen.

The Work Rather Than the Wage Tells

Whether the first of these principles is fulfilled—that a man must earn a day's pay—depends on whether the mine is organized partly for the purpose of providing that work or is planned solely with other purposes in mind.

The men in a mine can be divided into two general classes according to the manner of paying them—one class is paid by the day and the other by the piece.

The first are generally known as daymen or company men and the latter as miners. The pay of the daymen is definite and is the same whether there is much or little to do. These men may not receive as much as the miner, but it is regular and is not high one month and low the next. The earnings are constant, so that at the end of the year the company man is financially in a better position. As a result it is easier to get men to do company work than to mine coal. The main strength of the union has lain in the miners, who are numerically greater and who suffer the greatest variation in wages.

The following data are taken from a two-week payroll at a typical anthracite mine: The number of men drawing less than $1 a day based on the number of days they worked was 23; those getting between $1 and $2, 45; those from $2 to $3, 50; from $3 to $4, 32; from $4 to $5, 16, and over $5, 18. Such variations cause discontent.

In Coal Age for Jan. 9, Vol. 7, p. 45, it is reported for six counties in Arkansas that the average net earnings for the men working in rooms was $538 for the year and for the bottom men $529. Comment is then further made that "the average earnings of miners and men at other classes of work will be less than last year. Practically all the mines are crowded and a slow turn of cars generally prevails. The number of men locked out or on strike for one cause or another during the past year was over 46 per cent. of the total number employed at the mines."

It is clear, therefore, that there are more men than are needed for the output required, and it is fair to assume that there is a high cost of mining. Where there are too many loaders there are too many working places, and the transportation force having to visit all these workings has to be made unduly large. In turn the inefficiency of the haulage system results in the idleness of the men.

In two of the counties in Arkansas the earnings of the company men are greater than those of the men in rooms, though custom has it that they should draw the lower pay. The difference between the highest and the lowest of the company men is $270 and that between the roommen $390.

Minimum Wage Is the Distressing Problem

The low average of the mine workers' earnings is not the cause of the unrest. The discontent rather has its source in the inadequate pay of those who do not earn the average wage. The percentage of low pays may be balanced by a number of high pays with a good average as a result, but what should be desired is a greater equality in the amount earned. Much difference in the monthly income of the men indicates a poor arrangement in the mine, from which results a large difference in earning opportunity. This state of affairs is generally accompanied by unnecessary expense to the company.

It is often hard to interest a manager in the arrangement of the work in his mine so that the miners can earn a day's pay or so that there can be a more uniform wage. There is an idea in the minds of many bosses which has been handed down for many generations that a man should not be allowed to earn high wages. I, like many others, have held back a part of a man's pay when it was over a certain amount until he had a lower pay with which to offset it for fear that the "big boss" would make trouble for me for allowing the man to earn so much money, though he was only getting paid at the standard rates fixed by those over me. On the contrary I have never been censured for low pays, numbers of which have appeared on the pay statements of my subordinates.

Keeping a man's pay low was merely self-preservation in the days when a workman who was proprietor of his business had a helper who might save up enough money to start in business for himself and enter into competition with his former employer. It is doubtful, however, if any miner nowadays could save up enough in a lifetime to open up a mine for himself with all the equipment that is now needed. There need be no fear that if a miner earns a good pay he will create competition in the sale of coal.

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*Efficiency engineer, Scranton, Penn.

It may be argued that the miners are making a day's pay where they are not lazy. That is not the case in many mines. To be sure the operator must bring pressure to bear upon the worker to get him to work regularly and do a full day's work. But this is not the principal difficulty, and the difference in earnings is small where opportunities to load coal are reasonably equal.

The rates paid for mining are high—almost too high. In the union districts in central Pennsylvania the price for pick coal is 72c. a ton. This is paid whether the mining is in rooms and the coal hard or whether it is in pillars which have been standing and the coal is crushed. In the latter case a man can dig and load a ton in 20 min. At that rate he ought to earn $8.64 a day, allowing 50 per cent. of the time for resting. But what happens? He does not get enough cars to earn anywhere near that amount.

I have heard it stated that the men in central Pennsylvania earned more money when pick coal was 35c. a ton than they do now. But the past and present conditions have not been taken into account. One man telling about "olden times" at one mine said: "There were not many men here then, and the boss used to be around all the time telling you to load more. We made good money in those days." The blame for the loss in earning power is often angrily put on the union, whereas it ought to be partly borne by the men running mines for not maintaining correct conditions—men in proportion to the equipment and bosses in proportion to the mine.

Rates of Pay Should Make an Equal Wage Possible

There is an inflexibility in the rates paid for work which makes an inequality in the earning power of the men. Rates are generally the same for all parts of a mine or for all parts of a vein. In one anthracite mine $1.58 is paid for a 2-ton car of coal whether the vein is 8 ft. and free blowing or 4 ft. and hard coal. In the bituminous regions the same price is paid for pick coal whether it is in rooms or in crushed pillars. Business has been business in establishing the rates, and in any argument between employer and employee over what the rate should be, the attempt on both sides has been to charge all the traffic would bear. There has been no measurement of work by which attempts could be made scientifically to get an equitable basis for payment. Measurement of work is just as practical in mining as in manufacturing, where it is now being largely done.

Although the payment is made according to the ton or car loaded, responsibility for the amount of work done cannot be wholly cast aside by the management. Men are turned loose in a mine entirely too freely and expected to work out their own salvation. They cannot do it, for they do not work alone, but are dependent upon others for the opportunity to work.

The drivers, being paid by the day, are not anxious to deliver more cars than are necessary to keep their jobs and so neglect the miner. In consequence the miner does not earn as much as he might. One can hardly blame the driver so long as it is a fixed principle in life to get as much for as little as possible. Everyone is doing it, and he would be "kidded" by his friends if he did not practice it. Universally a mine is so undermanned by bosses that no work can be followed up, and the neglect of duty and failure to coöperate can become so common that the miners frequently suffer from needless delays.

Were the miner cutting the coal himself and delivering his own cars to the foot of a shaft or to a large side-track, he would be more independent and could be more reasonably blamed for not earning his pay. Such a system exists in some mines in England, but in this country we use larger cars and deliver them to the miner.

Miners Suffer from the Lack of Organization

The individual in a mine depends on the management to organize the work so that the proper balance is kept between the various machines and the work of each man or group of men.

A superintendent recently remarked that it is hard to stir up trouble at a mine if the men are being decently treated and are earning a day's pay. It will be found that the strength of a union increases at a mine in proportion as there is more cause for discontent. But this is not to be regarded as an argument that the men should be paid whether they do any work or not.

Increased earnings of the individual can be reflected favorably on the cost sheet. A man who is working a piece of coal which has been formerly neglected and is so situated that he is given only a car or two a day and whose earnings in consequence are low is likely to be a source of trouble. When it is necessary to keep a man and a mule for only a few cars a day, the transportation charge will be high. The cost of gathering was taken in one mine and found to run from 2½c. to 25c. The total cost for haulage was high because on only a few roads were there enough men to give a driver a full day's work. When the work was apportioned so that there were enough men on each road, the cost fell.

Need for a Full Turn of Cars for Each Man

It would be more advantageous to the workmen if the union leaders, instead of making demands for further increase in the rates of pay, asked for a better organization of the work so that the men got an equal number of cars. Rates are high enough now so that no man need overwork himself in earning a good pay. In a boiler-room a fireman will shovel into the furnace from 18 to 20 tons a day, which is more than a loader will load into cars.

One well-known union leader has been quoted as saying that 15 tons was not too much for a man loading after machines, and the union representatives agreed to a task of 12 tons at one mine. When one gets into the complex changing conditions of an anthracite mine it might seem a little doubtful whether this could be done, but again it is a case of the arrangement of work rather than a crying need of an increase in rates.

A recent number of *Coal Age* gives a high output per man at one mine of 5.1 tons a day, but even this is strongly in contrast with what is admittedly possible.

Under the present general manner of payment the only cure is to promulgate the idea that each man should produce a large tonnage per day. An increase in their output will be of advantage to the miners, as they are paid by the ton. It will also be to the interest of the company, for an increased output per handling unit will result from the proper organization of work by which the larger product is secured. Though there is no one cure for all ills, the application of the principles of efficiency to mining will greatly help to alleviate the conditions which are now a frequent and natural source of much irritation.

Miners Who Don't Mine

There are nearly a hundred thousand employees in the collieries of the anthracite coal fields of Pennsylvania who mine no coal. The exact number in 1913, the latest figure available, was 96,991. The men who mine and load the coal are the miners with state certificates who drill holes and blow down the coal with explosives, and the miners' laborers who assist the miners in drilling the holes and load the loose coal into mine cars. There were 44,346 miners in 1913 and 33,973 miners' laborers.

Thus the army of men who are employed at ventilation, transportation, drainage, maintenance and the preparation of the coal for market outnumbers by over 18,000 the men who are actually mining and loading coal. In other words, it takes more men to keep the mines safe and in condition to be operated than it does to mine the total output of coal.

There are nearly a hundred different positions in and about every colliery for which special training is not only advisable but often indispensable. The mere terminology of the various positions is confusing. There are doorboys, or "patchers," drivers, runners, bratticemen, masons, timbermen, tracklayers, foremen and assistant foremen, firebosses, pumpmen, blacksmiths, carpenters, engineers and firemen, slatepickers, breaker boys, and a host of others.

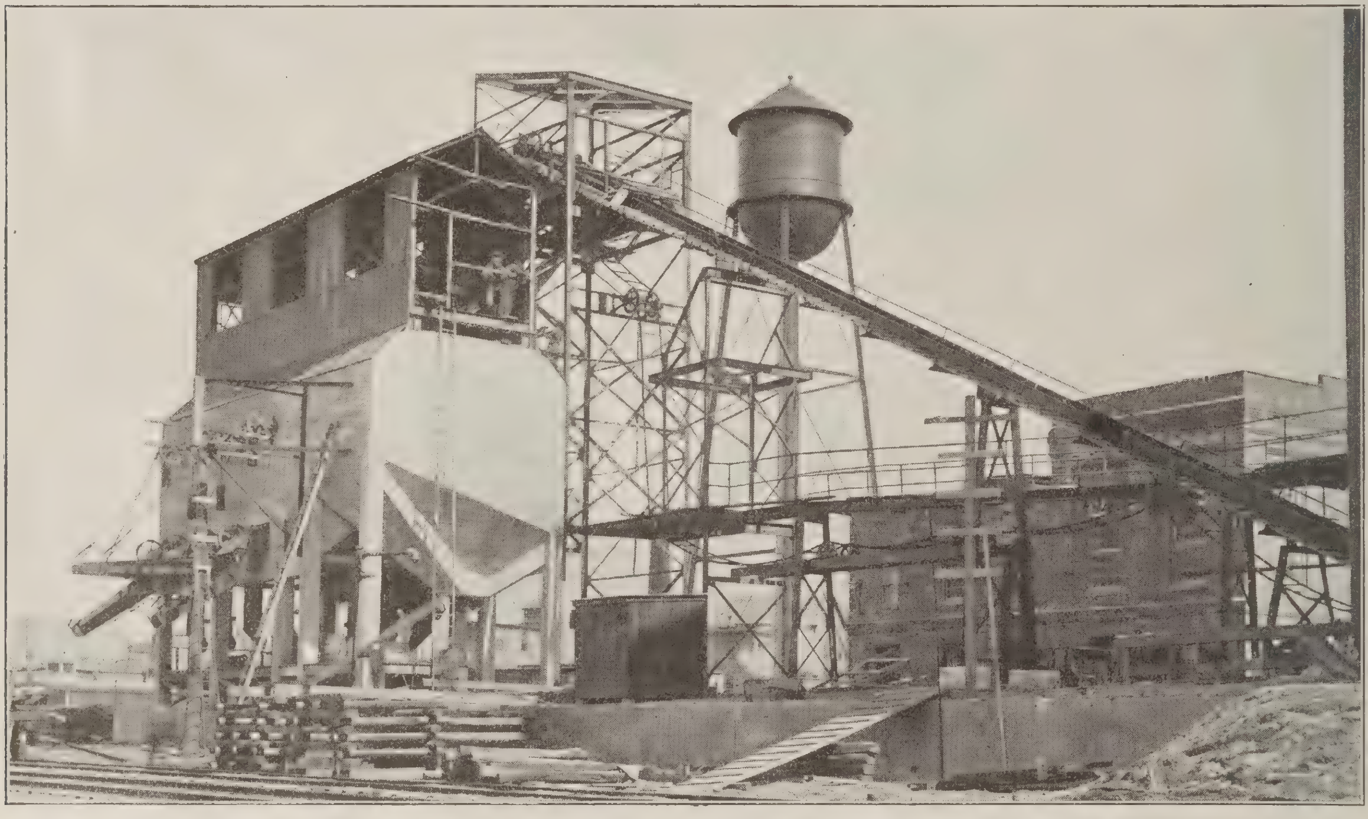
The excellent mine schools which now exist throughout the anthracite region either under the supervision of the local school boards with state aid, maintained by the operators, or conducted by the local Y. M. C. A.'s are now providing the special instruction and training necessary for many of these positions. Mining problems are discussed and much information is also disseminated through the mining institutes which are held throughout the region.

Handling Coke from Retorts

By R. G. Read*

The handling of coke at retort houses is receiving a thorough study with the idea of eliminating labor and making a better preparation of the product. Extensive advertising campaigns in various parts of the country have resulted in a keen demand for domestic coke to take the place of anthracite coal. To successfully meet this demand it is necessary to make a careful preparation of the coke including a through sizing to correspond to the various grades of anthracite.

Coke is fragile, absorptive and abrasive, and may be likened to an egg, a sponge or an emery wheel. A successful handling equipment must therefore convey and screen with a minimum breakage, quench without saturation and provide against excessive wear on the machinery.


WISCONSIN GAS & ELECTRIC CO.'S PLANT FOR STORING AND SIZING COKE WITH DE BROUWER CONVEYOR FOR CONVEYING AND QUENCHING THE PRODUCT AS IT LEAVES THE RETORTS

A successful machine for conveying and quenching the hot coke as it comes from the retorts is the De Brouwer conveyor. This was originated in Germany and is in extensive use abroad. A modification of the De Brouwer suited to American conditions has been perfected and installed in a number of plants in this country, particularly in the New England States.

This conveyor consists of two strands of special chain with crossbars spaced about 24 in. centers. This moves slowly in a watertight cast-iron lined steel trough. The quenching is accomplished by sprays placed above the carrying run of the conveyor. By this arrangement the amount of water can be easily adjusted so as to thoroughly quench the coke without soaking it, as the thickness and speed of the moving body of coke are under control. The excess water is drained by means of a water grate in the conveyor trough. This grate is in the form of screen bars so spaced as to refuse breeze, but pass the water.

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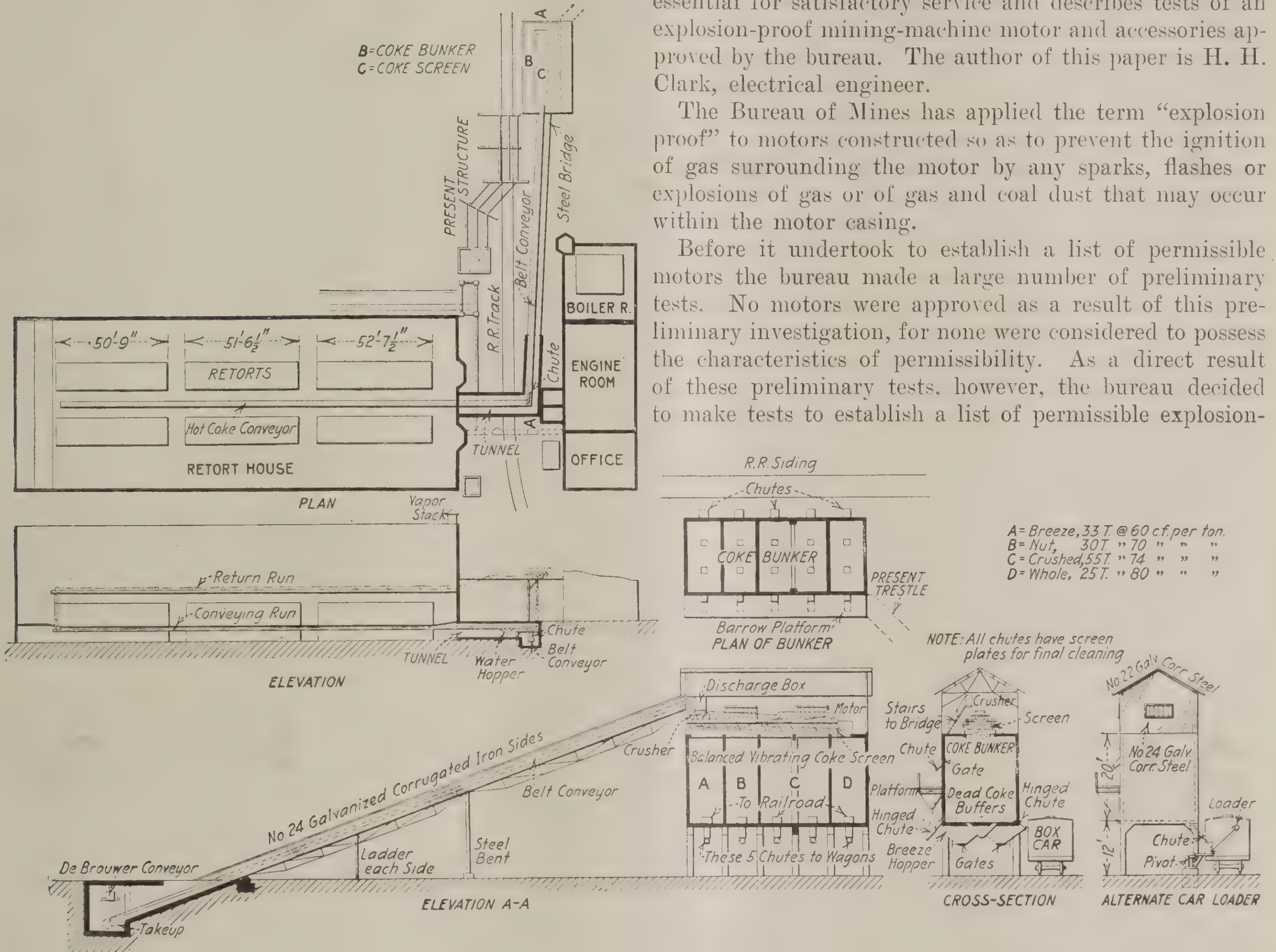
*Fisher Building, Chicago, Ill.

The grading of sizes may be accomplished by either a revolving screen of the open type or by a balanced vibrating screen. The vibrating screen is preferable for the fine sizes as it gives the body of coke a thorough agitation without dropping it as is the case with the revolving screen.

A typical and uptodate handling plant of this type is shown in the accompanying drawing. The operation is as follows: The hot coke is pushed from the retorts into a hot-coke car which travels on overhead tracks and serves as a chute for each group of retorts. The coke passes by gravity to the carrying run of the De Brouwer conveyor, which quenches and delivers it to a belt conveyor.

This belt conveyor takes the coke to the screening station, where it may be either crushed or not and screened to make the various sizes indicated. Provision is made for storing the coke in the yard either screened or as it comes from the oven. The coke from the storage yards may be returned by means of other equipment to the screening station when desired. The plant is being installed for the Wisconsin Gas & Electric Co. at Racine, Wis., by R. H. Beaumont Co., of Philadelphia, Penn.



PLAN AND ELEVATION OF THE GAS AND COKE PLANT OF THE WISCONSIN GAS & ELECTRIC CO., RACINE, WIS.

Permissible Mine Motors

Among the Bureau of Mines' investigations dealing with the means of lessening such dangers as attend the use of electricity in the mining industries, it has undertaken one that has for its purpose the establishment of permissible explosion-proof motors for use in places where an electric spark or flash might ignite inflammable gases or dusts.

Technical Paper 101, "Permissible Explosion-Proof Electric Motors for Mines; Conditions and Requirements for Test and Approval," which has just been issued, mentions the details of construction that the bureau considers essential for satisfactory service and describes tests of an explosion-proof mining-machine motor and accessories approved by the bureau. The author of this paper is H. H. Clark, electrical engineer.

The Bureau of Mines has applied the term "explosion proof" to motors constructed so as to prevent the ignition of gas surrounding the motor by any sparks, flashes or explosions of gas or of gas and coal dust that may occur within the motor casing.

Before it undertook to establish a list of permissible motors the bureau made a large number of preliminary tests. No motors were approved as a result of this preliminary investigation, for none were considered to possess the characteristics of permissibility. As a direct result of these preliminary tests, however, the bureau decided to make tests to establish a list of permissible explosion-proof motors, and issued its Schedule 2, "Fees for Testing Explosion-Proof Motors." This gave the general conditions under which motors could be submitted for trial and the fees to be charged for making such tests. Technical Paper 101 sets forth more fully than Schedule 2 the details that the bureau considers essential to satisfactory explosion-proof motor construction.

The Bureau of Mines considers a motor to be permissible when it is the same in all respects as the sample motor that passed certain tests made by the bureau and when it is installed and used in accordance with the conditions prescribed by that body. The paper gives the requirements for approval of motors, outlines the nature of the approval of the bureau and describes the approval of an explosion-proof coal-cutting equipment.

Co-operative Mining in Illinois Threatens the Industry

SYNOPSIS—A summary of the peculiar status of coöperative mining in Illinois. Union members of one company have already thrown down the gauntlet to the United Mine Workers of America and the situation is replete with serious possibilities. The movement is spreading rapidly and is a menace to legitimate mining companies.

Coöperative enterprises of different kinds have been tried time and again, but as a rule they have seldom proved an economic success. Coöperative coal mining in the Illinois field, however, does not seem to fall in this class. It has been in operation for some time, and of late has spread so rapidly that it even threatens to become a national issue.

Coöperative mining in Illinois originated some years ago, and was more or less directly due to railroad ownership of mines. It is generally believed that the roads quoted a delivered price, including both the cost of the coal and the freight rate, that aggregated much less than an independent operator could compete with. This eventually wound up in a spectacular rate war among the trunk lines, during which freight rates were slashed down to as low as $2 per car to East St. Louis, as compared with 32c. per ton at present.

It was out of this war that the independent operators, seeking relief from the untenable conditions prevailing, hit upon the plan of coöperation. The miners themselves had been working on such poor time that they were reduced almost to extreme poverty and were eager to accept any change whatever.

Union Strongly Opposed to Such Coöperation

The method of operating the coöperative mine was brought out fully before the scale committee meeting at Peoria, Ill. It appears that the miners, who are all union men, are assessed the difference between the cost of production and the ultimate selling price. Thus, although they are nominally receiving the full wage scale, they are obliged to rebate the company for losses incurred by working the mine when adverse marketing conditions prevail.

At this same meeting the officers of the United Mine Workers of America assured the independent operators in attendance that drastic measures would be taken to do away with these coöperative mines. There are now about 10 concerns, having an aggregate daily capacity of 8000 tons, who are operating on a coöperative basis, and the indications are that this may very probably be doubled within a year, unless aggressive action is taken. The operators more closely in touch with the situation are very skeptical of the union's power to cope with the matter. It is generally felt that should the organization resort to the drastic measures mentioned, the local union will give up its charter and the mine will become nonunion. This would, of course, be a serious blow to organized labor.

Some of these companies are incorporated under the laws of Illinois; others are copartnerships. In either case the miners buy shares, usually from $100 to $200 each. The number of shareholders runs from 20 to 100, depending on the size of the mine. Some of the mines work only coöperatives, but the greater part of them work some members of the U. M. W. of A. When there is a demand for coal, all the companies work all the union men they have room for.

In the case of the Oakland Coal Co., located near Belleville, Ill., the loss Feb. 15 to Mar. 31, 1914, equaled one-third of the union scale. In other words, if a man worked 10 days at $3 per day, he received $30 and paid back to the company $10. This statement is based on an affidavit made by a stockholder of the Oakdale Coal Co., which was as follows:

Belleville, Ill., April 18, 1914.

To Whom It May Concern:

I have been and am now working for the Oakdale Coal Co. I own six shares in this company. I should have drawn $22 on Mar. 15, but I drew none of this and had to pay in $5 to defray expenses.

I should have drawn $42.50 on Mar. 30, but they paid me $12.50 and the other $30 was used to defray expenses.

I should have drawn $77 on Apr. 15, but I was paid only $57 and the other $20 was used to defray expenses.

Whenever we do not get enough for our coal we assess each man a certain amount and deduct it from his pay.

In other words, I mean, if we do not get enough money from the sale of our coal to meet our payroll, we assess each man a sufficient amount so that the money from the sale of the coal and payroll will balance.

State of Illinois,
County of St. Clair

, residing in the city of Belleville, county of St. Clair, state of Illinois, personally known to me, Stephen A. Butler, a notary public, in and for the above county, appeared before me this 18th day of April, 1914, and made affidavit that the above statement is true and correct.

STEPHEN A. BUTLER,
Notary Public.

Two of the ten coöperative mines were sunk by the miners—Golden Rule, near Lenzburg, and Mulberry Hill, near Freeburg, both on the Illinois Central R.R. On account of the stress of competition, the mines at these two small towns were closed about 1910. The company then owning them, having mines in other localities on the Illinois Central R.R., refused to lease these two plants to the miners, who then opened mines themselves.

Strong Arguments for Coöperative Mining

A great majority of the miners of Illinois are thrifty, saving men, and as soon as they think they are permanently located, begin to buy lots and build homes, getting the money mostly from building associations. Freeburg and Lenzburg offered no other opportunity for employment, and if the miner moved away his home would become valueless. The business men faced practically the same condition; the moving away of the miners meant the destruction of their trade and an enormous shrinkage in the value of their real estate.

There being a 7-ft. seam of coal at a depth of 90 ft., the miners leased the land on a royalty basis of 3c. per ton. Mines were sunk at Freeburg and Lenzburg, the miners doing the labor and the business men in the respective towns advancing the necessary funds. Since commencing operations these properties have repaid all money expended on them and the miners now not only own them both, but have protected their properties also.

The Bessemer Coal Co., which owned the original mines near Freeburg and Lenzburg, went into the receiver's hands about 1912. On sale of this company's property, the Freeburg mine was purchased by L. Senior, of Belleville, and the Lenzburg by the Tierre Coal Co. Since Apr. 1, 1914, neither of these properties has been operated, while both of the coöperative companies have been working every day. The eight other coöperative companies lease their mines from operators who were unable to make both ends meet. The royalty paid runs from 3c. to 6¼c. per ton of mine-run. All the coöperatives belong to the U. M. W. of A. and are supposed to get the full scale, although none of them do.

DIFFICULT POSITION OF THE MINERS' UNION

The last coöperative mine was started Apr. 1, 1914, 100 miners purchasing the operation of the Winkle Coal Co., located in Winkle, Ill. The mine was acquired without a cash payment being made, the men agreeing to make a part payment twice a month until the agreed price was liquidated. Upon hearing of the Winkle coöperative organization, the officials of the U. M. W. of A. began to act. An executive board member was sent there, who shut the mine down and called a meeting, at which he told the men they would have to give up the mine or he would take their charter away. By a large majority vote the charter was relinquished. The mine is still in operation and no further effort on the part of the U. M. W. of A. has been made to stop it.

All the coöperative mines are located in the "Inner Group" and take the lowest freight rate to East St. Louis and St. Louis—32c. and 52c. per ton. The production is sold by brokers in St. Louis, the price usually being on a basis of 79c. or 80c. f.o.b. cars at mine for run-of-mine coal. Of this the broker takes 3c. for his commission. He settles with the producer twice a month.

THE LEGITIMATE OPERATOR BETWEEN TWO FIRES

The average cost of mine-run coal with the legitimate operator, f.o.b. cars at mine, runs from 90c. to 95c. The only operator who can compete with the coöperative mine is one who owns both mines and railroad and is willing to give away part of the freight profit with his coal. At a hearing before the Interstate Commerce Commission in St. Louis last fall, several witnesses testified that the St. L. & O. F. R.R. Co. and the St. L., T. & E. R.R. Co. made a practice of doing this. Of course the excessively low price is made only during the dull season, from Apr. 1 to about Aug. 1.

Contracts for coal that run for a year or two are generally let at prices that show a small profit to the legitimate operator, but open-market business in the dull season is practically all taken by the coöperatives and railroad-owned mines. As a consequence, legitimate mines do not work over two days per week, and the companies suffer severe losses during this time.

The coal fields adjacent to St. Louis are ideal for the coöperative. The seam is near the surface, is from 6 to 8 ft. thick, the roof conditions are good and the coal shoots readily on the solid. The average miner can produce 10 tons per day, for which he receives 61c. per ton run-of-mine, making his gross earnings $6.10 per day; powder, tool sharpening and oil aggregate about 80c. per day. While the coöperative miner gets less than the scale during the dull season, he realizes much more during the busy season. In a series of years, his returns will be more than the mining scale, besides which he works from 50 to 100 days more per year than he would in the legitimate mines.

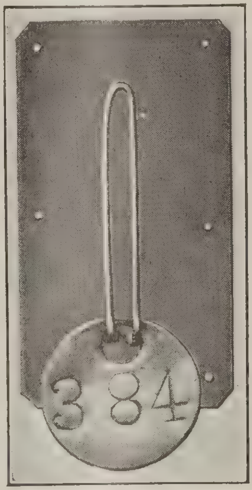
Owing to these conditions, many operators are willing to lease their properties to the miners, and if the U. M. W. of A. does not interfere, this method of mining will spread rapidly and will eventually displace the legitimate operator, and probably the union also in Illinois.

There are several coöperative mines working in the Peoria district and four are now being started near Springfield. The following is a list of the coöperative mines:

Name	Railroad	Location	Tons
Summit Coal & Mining Co.	L. & N.	Belleville	1000
Fullerton Coal Co.	L. & N.	Belleville	1200
Eldnar Coal Mining Co.	L. & N.	Belleville	800
Oakdale Coal & Mining Co.	L. & N.	Belleville	500
Mulberry Hill Coal Co.	I. C.	Freeburg	1200
Star Coal Co.	I. C.	Freeburg	1200
Golden Rule Coal Co.	I. C.	Lenzburg	600
Harding Mine (Glendale)	I. C.	Belleville	500
Cutler Mine	W. C. & W.	Cutler	350
Winkle Mine	I. C.	Winkle	750
City Coal Co.	L. & N.	Edwardsville	500
			8600

New Check Hook for Mine Cars

A new form of check hook recently invented by J. T. O'Neal, of Danville, Ill., is shown in the illustration. The hook is made of No. 14 spring steel wire, and is neatly attached by soldering the prongs on the lower end of the hook to the back of a galvanized iron plate, 2 in. in width and 4 in. in length, made of No. 27 gage material. The plate is attached to the side or end of a wooden mine car with six shingle nails. In the case of fastening to a steel mine car, small rivets would be used. The inventor devised this check hook while working as a car builder at the Vermilion mine of the Bunsen Coal Co., the idea suggesting itself on account of the number of checks that were lost from the mine cars while in transit when attached loosely to a nail on the mine car—the old method. Several of the new-style hooks were placed in service at the mine mentioned, and they proved to be of such advantage that there are now over 800 of these hooks in service at Vermilion mine.



THE HOOK WITH MINER'S CHECK ATTACHED

Mr. O'Neal explains the following features, which should recommend his form of hook for use by mine operators: The miner's check can not be released or lost except by accident to the mine cars while in transit, and is only removed by the dumper when the car has reached the dumping point in the tipple. No trouble is therefore experienced either by the management or the coal miner as the check on the car is never lost.

The check hooks used at the mine mentioned have been in service for more than a year, and the excellent results accomplished by the use of this form of check hook have been fully demonstrated in actual practice.

Steel Breaker at Hazleton, Penn.*

By C. Stuart Phillips†

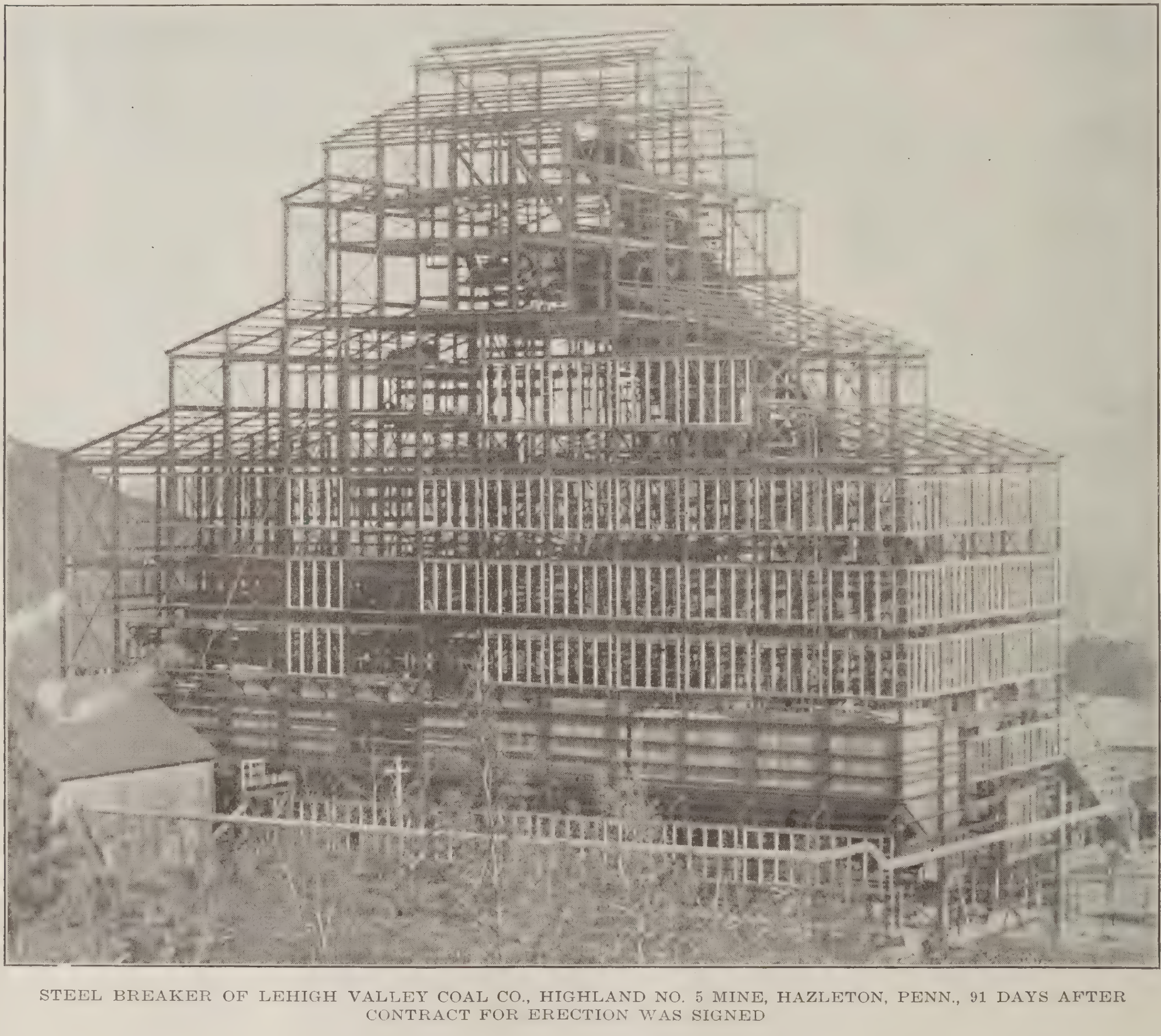
SYNOPSIS—A steel breaker at Hazleton was designed and erected in 91 days and, if expectations are fulfilled, will be ready for business 6½ months from the time the contract was let. Only the framework is fireproof.

Practically the last great industry to cling to the use of heavy timber framing for permanent construction has been the anthracite industry of Pennsylvania; but within the last three years the wooden coal breaker has started to go the way of the wooden ship and the wooden bridge.

One of the first companies to abandon the old type was the Lehigh Valley Coal Co., which three years ago rebuilt its Mineral Springs and Franklin breakers of structural steel. In the short time following there have been placed in operation two other steel breakers in the Wyoming Valley, two in the Schuylkill district, and at present three more are in process of erection in the former district and two near Hazleton.

The timber breaker is highly inflammable, framing, floors, siding, roof, pockets and bins being of wood, usually yellow pine. Three disastrous fires, one with loss of life, within the last year have emphasized its danger. The Ewen breaker of the Pennsylvania Coal Co. in the Wyoming Valley, the Lattimer No. 4 breaker of the Pardee Coal Co., and the Highland No. 5 breaker of the G. B. Markle Co. in the Hazelton district each burned to the ground, being completely lost in two or three hours. In the last-mentioned case the fire was with difficulty kept from spreading down the slope to the mines, the whole plane having to be dynamited to prevent this occurrence.

All these breakers are being rebuilt of steel, and the Markle company is replacing several of its timber planes



STEEL BREAKER OF LEHIGH VALLEY COAL CO., HIGHLAND NO. 5 MINE, HAZLETON, PENN., 91 DAYS AFTER CONTRACT FOR ERECTION WAS SIGNED with steel, so that conflagrations, if started, will not spread from the wooden breakers to the mines.

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*Published in "Engineering News," July 1, 1915.

†G. B. Markle Co., Jeddo, Penn.

The erection of the new breaker at Highland No. 5 has been interesting because an enviable record for speed has been established for this type of construction. The old breaker burned on Jan. 15, 1915, and the contract for the new steel structure was signed on Feb. 9. The Guerber Engineering Co., of Bethlehem, Penn., designed both the general structure and its details and furnished and erected the steel.

Until the breaker was reërected the coal had to be hauled from Highland No. 5 mine to a breaker 2 mi. distant to be crushed, cleaned and assorted. This entailed much expense, and consequently the G. B. Markle Co. let the contract for the rebuilding of the tipple with a provision that a $75-per-day bonus or penalty be added or deducted respectively from the contract price to date from May 19, which was 100 days from the signing of the contract.

DESIGNED AND ERECTED IN SIX AND A HALF MONTHS

Seven designers were sent to the G. B. Markle Co.'s offices at Jeddo the day after the agreement was concluded. These men worked 14 hr. a day, consulting the coal company's engineers as to panel lengths, machinery locations, loadings, etc. As fast as one section was designed and approved, prints were sent to the detailers at Bethlehem. On the approval of the first batch of details the shop started fabrication.

The design was finished by Feb. 26, and the following day the first shipment of steel was received on the site. The previous week the erecting gang had come on the ground and unloaded their tools and erected the derrick, so that no time was lost. The débris had been cleared away and the foundations prepared by the coal company's forces. The working time was 10½ hr. a day, seven days a week; but much time was lost, 12 days in all, on account of the bad weather.

The field organization consisted of an unloading gang, a derrick gang, a handline erecting gang and four riveting gangs. The derrick used was a stiff-leg 5-ton 100-ft. boom steel derrick, set in the center of the building. The latter being 158 ft. long and 75 ft. wide, the corner columns were reached from the center set-up. When the erection had progressed to the 35-ft. height the derrick was jumped up to that floor and again to the 75-ft. height, from which elevation the rest of the steel was set, 148 ft. being the maximum height in the center of the building, stepping down to about 90 ft. at the two ends.

At each move of the derrick three-quarters of the steel was set with the boom outside the stiff-legs; the boom jumped inside the legs to erect the remaining quadrant. Two panels near the center were left open, as the derrick frame was hoisted up bodily each time the rig was raised, using the boom as a ginpole. When the rest of the erection was completed the derrick frame was dismantled and lowered to the ground and these two panels erected with the boom as a ginpole.

The wind bracing, channel girts for the corrugated siding, etc., were erected by handline. The riveting was done by compressed air furnished by the coal company, Ingersoll-Rand pneumatic hammers being used. My experience has been that the Boyer hammer has usually been the most satisfactory on all-around bridge and building work, but the Ingersoll-Rand proved the best on this work, being shorter than the Boyer and more easily manipulated in the close quarters afforded by the wide flanges of the Bethlehem sections.

Altogether there are 736 tons in the structure, 25,000 rivets, 8300 bolts, and 900 tie-rods, small castings, etc.; 3000 pieces were erected by the derrick and 1700 by handline.

The first column was erected Feb. 28 and the first rivet driven Mar. 14. The job was completed and accepted on May 11 (the date the accompanying photograph was taken), 91 days after the signing of the contract and 8 days before the contract time expired.

The coal company's carpenters started work on Apr. 18 on the wooden bins, pockets, floors, walks, chutes, etc., and the machinists began installing the heavy machinery shortly afterward. The work of covering the sides and roof with corrugated iron has also been started, and the breaker will probably be in complete operation by Aug. 1, or 6½ months after the destruction of the old timber breaker.

STEEL COSTS ABOUT 60 PER CENT. MORE THAN WOOD

Perry Sneathen had charge of the design and Victor Pfeiffer superintended the erection for the Guerber Engineering Co. The G. B. Markle Co.'s interests were placed in my charge, as engineer in charge of erection.

In comparing this type of steel breaker with the standard timber construction, the following comparisons can be made:

1. Cost—The contract price for the steel was between $65 and $70 per ton, totaling $44,000. The framing for a timber breaker of like dimensions would necessitate about 510 M of lumber and would cost $25,000. While the initial cost of the steel is greater, the smaller insurance rates will in time equalize the two.

2. Speed of Erection—The steel structure was erected, complete, in 60 working days, practically the time required to raise a timber frame. The first delivery of steel, however, was made 18 days after signing the contract. Yellow-pine timbers 12x12 in. and 14x14 in., in sufficient quantity cannot be obtained from the South in less than 60 days after placing an order; thus six weeks' time was saved by using steel construction.

3. Fire-Resisting Qualities—The steel-frame breaker is far less inflammable than the timber frame. It is, however, by no means fireproof unless the remainder of the structure is in keeping.

In the breaker in question there is so much wood in the flooring, walkways, pockets, bins, window frames, etc., that it is quite possible that a fire could break out and generate sufficient heat to soften and weaken the steel columns and cause the whole structure to collapse. If a real fireproof structure is desired, the floors, dump and jig pockets and loading bins should all be of reinforced concrete, the walkways should be of iron, and metal sash should be used for windows. In this connection it may be stated that wooden pockets and bins have to be renewed every five years. Reinforced-concrete walls costing 60 to 75 per cent. more in initial outlay would probably last three times as long.

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Liability of Corporation's Successor—When a coal company transfers all its assets to another company, practically ceasing to exist, without having paid its debts, the purchasing corporation takes the property subject to an equitable lien in favor of the creditors of the old company. But mere purchase of a part of a coal company's property, after injury had been sustained by one of its employees, did not subject the purchaser to liability for that injury, the selling company having retained sufficient property to discharge all of its liabilities. (Kentucky Court of Appeals, Clouse vs. Carter Coal Co., 173 Southwestern Reporter 794.)

Extracts from a Superintendent's Diary

This morning I went on a little tour of inspection inside one of the drifts, and after I had finished and was on my way back to my office, still clad in my mining clothes, I had an adventure with a book agent.

He all but collided with me just as I passed Tim Tenney's house. Apparently Tim's wife hadn't given him a very cordial interview; at any rate he seemed pretty much worked up about something and was so busy trying to get his bearings that he was out of her yard and onto the sidewalk before he realized it.

I had neglected to blow out my carbide light on coming into daylight, and the book agent came so near to me that he singed one of his eye-brows on the flame. He managed to get his thoughts together pretty quickly after that.

I extinguished the flame and begged his pardon. He accepted it very graciously, and accomplished something else at the same time—he backed me up against a corner of the fence and started off on his set speech before I realized just what he was up to. It was all done so cleverly that I stared at him in evident admiration. He read my thoughts and waxed enthusiastic.

Then he began to address me as Mr. Coal Digger, so my sense of humor got the better of me and I urged him on out of sheer deviltry. I enjoyed every minute of the experience, even the grand finale when he turned over to the ruled pages in the back of his prospectus and insisted that I sign my name on a certain line.

The title of his book was "Getting on in the World," and again and again while enlarging upon its merits he assured me that it contained all the necessary information to show me how to get above being a common coal digger. He thought that I would have no trouble climbing up to a position in the commissary, and he felt sure I might in time even get an assistant superintendent's job.

I told him all that sounded very well, but I couldn't read or write.

"That don't make any difference," he ventured; "get your wife to read it to you."

"Was that what you suggested to Mrs. Tenney just before I came along?" I asked.

He had to grin in spite of himself. "I sure did, young fellow," he said, "but if I had known what kind of a woman she was, I wouldn't have done it. After I realized my mistake I tried to patch things up for her old man because I sure felt sorry for him, but little did I accomplish. It looked for a time as if I'd have to call on some of the neighbors for protection. I hope her man don't come out of the mine until she has had a chance to cool down some."

Then I changed tactics suddenly and asked him why he didn't absorb a little of the "sure rules for success" himself and capture a job with a fat salary attached.

To which he replied: "Don't get fresh, son, just because I've taken an interest in you. When you work up to my stratum in society, come around and I'll give you some further advice; but in the meantime just attach your signature to the prospectus and sleep with the book when it comes. Just to put you right, though, take it from me that you won't get far unless you learn to respect your superiors."

The Labor Situation

SYNOPSIS—Union anthracite miners are seeking 71,000 new members. Gilday accepts state position. Strike has permanently injured Ohio.

In the anthracite region the canvass of the union for members seems likely to prove as exciting as a political campaign and will be conducted with all the aids which are used by politicians in making an appeal to the electorate. The stores in many places will be closed and the clerks will join the procession. Bands will play and a string of automobiles will be in line. This demonstration will serve not only to initiate the campaign, but to act as a notable recognition of the dignity of mine labor.

The membership of the three anthracite districts is said to amount to somewhat over 100,000 men. The report of the Department of Mines for 1913 shows 175,310 men employed in and around the anthracite mines, but of these 424 are inside foremen, 1086 are their assistants, 778 are firebosses and their assistants, 121 are superintendents, 419 are outside foremen and 841 are bookkeepers and clerks. Some of these men might join the union, and to balance them some of the other men not belonging to the specific categories mentioned might be unlikely to affiliate owing to official position. Consequently the total—3669 men—might be deducted from the aggregate working force of the anthracite region to obtain the number of men who might be expected to be union members. Roughly, then, there are 71,000 men, or 42 per cent. of the whole available working force, whose affiliation is to be sought.

This appears a large number, and in some parts of the region there must be large bodies of men ununionized; for in others the 100-per cent. union has been secured. However, it must not be supposed that the union is disintegrating, for in 1912 the membership was not nearly so general. It was then only about 30,000, while in 1910 it was little more than 15,000.

Pat Gilday Becomes Chief of Bureau of Mediation

Patrick Gilday, of Morrisdale Mines, Penn., who was formerly president of District No. 2, which covers central Pennsylvania, and who was succeeded at the last general union election by James Purcell, of Wellsboro, Penn., has been appointed by John Price Jackson, who is State Commissioner of Labor and Industry, as chief of the Bureau of Mediation and Arbitration for the state of Pennsylvania, with a salary of $3500 a year.

Mr. Gilday has been recently a part of the conciliation board of the United States Department of Labor. A worse choice than Patrick Gilday could well have been made. He is by no means an irreconcilable. He believes in the miners keeping their contracts and at a recent convention urged that both operators and miners be kept in line by the assessment of fines for violation of agreements. He is a warm advocate of education and believes the miners should help worthy applicants through State College.

In the Kanawha district, where he acted as conciliator with Charles W. Mills and A. L. Faulkner, for the United States Department of Labor, the commissioners showed no great amount of strength of mind, presenting as they did alternative bases for settlement. In the provision of one of these the check-off, which is generally regarded as illegal, was included. It was thought that Federal mediators would hardly recommend an arrangement which was at least of doubtful legality. It had been hoped that the report, by omitting this provision entirely, would tacitly condemn any such provision. However it left the question open by including it in one of the alternatives; and it must be admitted that the temporizing policy succeeded and one of the plans suggested was speedily accepted, and the strike was soon at an end. The operators thus conceded practically everything to the miners, including the bitterly opposed check-off.

Strike Is Permanently Injuring Ohio

Last week we recorded the fact that the Sunday Creek Co. had announced its withdrawal from the Hocking Valley coal field. This withdrawal, while said not to be permanent, will continue until conditions become such that the field can be operated at a profit. This marks the final closing of 10 mines in what is known as the Hocking Valley Ry. side of the valley. In many cases the stocks in the company stores have been moved to the West Virginia field, denoting a complete abandonment of these commissaries for the present.

On the Toledo & Ohio Central Ry. side of the valley the Sunday Creek Co. is still operating three mines. These are No. 254 at Jacksonville, No. 301 at Congo and No. 266. In addition the company is still operating one of the San Toy mines, located on the Baltimore & Ohio R.R. It is doubtful if even these mines will be operated for any length of time unless conditions in coal circles become better. It is generally believed that the mines will be closed in two or three weeks.

The company is devoting its operations largely to the West Virginia field, where labor troubles are not so frequent and where freight rates are more favorable. The property of the company in that field, which has been partially neglected for some time, is being put in shape for a large output. John H. Winder, general manager of the company, in speaking of the company's action, said: "These mines go down and they go down to stay until something is done for relief. We are not justified in operating these mines under present conditions."

Like many other Ohio corporations, the Maynard Coal Co., of Columbus, Ohio, having mines at Rutland, Meigs County, Ohio, near the Pomeroy Bend, is looking in an outside state for an opportunity for development and will establish a model operation in Perry County, Kentucky.

It is claimed that with the present discriminatory freight rates, the Ohio fields are unable to compete with the West Virginia, Kentucky and even with the Tennessee fields, where coal can be produced so cheaply that it can be placed in the Ohio market for even less money than Ohio coal costs to produce. The unfavorable legislation on the part of the Ohio General Assembly and its passage of the anti-screen law is also given as one of the causes for withdrawing from the state. The Sunday Creek Co. also declares that the prolonged strike in the Ohio fields has permitted the producers from West Virginia and Kentucky to invade, capture and keep the markets formerly held by Ohio coal.

Future of the American Mine Safety Association

The secretary, H. M. Wilson, of the American Mine Safety Association, under the instructions of the executive committee has presented to the members a choice of one of three courses. These are: To merge the association with the National Safety Council, to continue as a separate association with increased dues or to disband the association. The last plan is not easy, as the society is in debt.

The National Safety Council has a membership of 1300, with 3500 representatives—some members having more than one representative in the organization. The American Mine Safety Association is small in comparison with the body with which union is proposed, having only 44 associate members and 162 active members. The larger society is interested in safety, not only in mining, but in manufacture, railways, street cars, public places, in the insurance of employees and in other fields.

It has an assured income of approximately $25,000, and this is increasing. The American Mine Safety Association has an income of $1700. As a result while the mine society can pay its officers no salary whatever and is accumulating a perplexing debt, the National Safety Council is able to maintain a competent and well-paid secretarial and clerical office force at its Chicago headquarters. Its safety circulars are issued weekly instead of monthly, and it has 17 strong local branches in cities from Boston to San Francisco which are holding monthly meetings or rallies.

The Railway Safety Association has recently been merged as the Railway Section of the National Safety Council. Similarly the American Mine Safety Association is invited to affiliate itself as a Mining Section. The dues for 1915 will be unchanged, but after Jan. 1, 1916, membership will be renewed in the National Safety Council on its regular schedule of dues, which is $1 for service members and $5 for active members. The industrial members, corresponding to the associate members of the American Mine Safety Association, will pay $10 for 100 employees, $15 for 250, $25 for 1000 and $100 for 10,000. Each $5 of such dues paid will entitle a member to one additional representative and one set of service literature.

What Costs Little Is Little Valued

The American Mine Safety Association made the mistake of setting its dues too low, like many other societies. It was evaluated exactly at its own valuation. The fear to put institutional dues too low is always a grievous mistake. A business-man looks with suspicion on an association which demands $10 a year and will even let him in at $3, but which nevertheless assures him that it is doing a work worth twenty or more times the expenditure requested. He feels about the proposition as a man does who is offered a new hoist at one-third the recognized price. The appeal for a mere dole is met with suspicion, and it is likely that after the year is out he will not renew his subscription.

The safety movement is worth a great deal to miner and operator. The association has done much to fill the need of the hour. It would have done more had it been launched as boldly as the National Safety Council.

Many Persons Wanted a Larger Field Covered

There has been a feeling in Alabama that the American Mine Safety Association did not completely cover the field. It was argued in reply that to cover too large a field was to weaken its value, but Alabama operators persisted in their belief that the safety society which they favored should cover work at furnaces, in sawmills and factories and so they organized the Alabama Safety Association. There is evidence of other like secessions and duplications, and consequently the larger appeal of the National Safety Council is receiving careful consideration.

The Executive Committee, under art. 6 sec. 2 of the constitution, has called a meeting to convene in the offices of the secretary, at Sewickley, Penn., July 15, 1915. Voting will be by letter ballot.

COMING MEETINGS

The Order Kokoal will hold its annual pow-wow at Chicago, Ill., July 13 and 14, 1915.

Northwestern Retail Coal Dealers' Association will hold its annual meeting July 15-16, 1915, at Minneapolis, Minn. Secretary, H. L. Laird, Minneapolis, Minn.

The Southern Appalachian Coal Operators' Association will hold its semiannual meeting July 23, 1915, at Knoxville, Tenn. J. T. McCoy, Knoxville, Tenn., is secretary.

The American Mine Safety Association will hold a meeting July 23-24, at Billings, Mont. Secretary, H. M. Wilson, 40th and Butler St., Pittsburgh, Penn.

The United First-Aid Corps of the 4th district, Delaware, Lackawanna & Western R.R. Co.'s coal department, will hold its third annual first-aid contest at Harveys Lake, Penn., on Aug. 14, 1915. Secretary, Lewis Richards, 212 East Green St., Nanticoke, Penn.

The Somerset County Miners' First-Aid Meet will be held at Boswell, Penn., Sept. 4. The names of the local committee follow: F. W. Cunningham, Somerset, Penn.; Samuel Steinbach, Somerset; Richard Maize, Jerome; John Gibson, Jr., Boswell; Ralph Zimmerman, Ralphton.

The American Mining Congress will hold its 18th annual session at the Exposition Memorial Auditorium, San Francisco, Calif., Sept. 20-22, 1915. J. F. Callbreath, secretary, Majestic Bldg., Denver, Colo.

Editorials

Why Are Coal Strikes of Such Frequent Occurrence?

Under this caption is discussed in this issue some of the causes which appear to one investigator to lead to discontent and strikes. He believes that the inequality in earnings around the mines is a constant source of irritation and that many men, frequently from no cause over which they have control, are earning less than a living wage, even where the mines at which they work run with reasonable steadiness.

With this argument it is necessary to differ. It is certainly not true of union mines, where most of the strikes occur. There are probably no mines operating under a scale in which the requirement is not made that the turn must be equalized. To ascertain this fact, reference has been carefully made to the eastern Ohio, Coshocton, Kanawha, Terre Haute, Des Moines, Wyoming, Du Bois and Pittsburgh agreements.

The clauses relating to the car turn in these contracts are not precisely similar. In some the turn must be squared every month, in others every week or every day. In some the turn must be proportioned for pick miners and machine loaders according to the wage rate per ton so that both can earn the same wage. The Ohio agreements, as far as investigated, require specifically that no free turns be given in room or entry. The Pittsburgh agreement is more elastic and says: "An equal turn shall be kept as far as practicable. This must not interfere with development or necessary work."

It is clear, then, that the equal turn is quite generally established in those mines which are frequently the scenes of strikes, and it is also true that the rule is always kept in a manner satisfactory to the union. That is, at the end of the period stipulated or even more often the miners are allowed to equalize the turn as set forth on the weigh sheets. Those who have had a shortage of cars are given a balancing excess if they so desire.

But the equal-turn rule is by no means as just as might at first appear, especially as it is administered. In Ohio it appears in an extremely crude fashion which declares openly for equality. In Indiana it is somewhat fairer and simply states that every miner shall be given an equal opportunity to load an equal turn. This makes it possible to refuse to give a man cars who has lost his right to them by leaving the mine early or by refusing to load them when offered.

Anyone who has been in a drift mine knows how often men leave early or arrive late and how frequently they refuse cars because they are not prepared to load them. Quite often the miner has a valid reason for refusing cars and the matter cannot be determined by the driver or the foreman. So in the long run the rule is to determine the right to cars by the weigh sheet. Thus the men who would work are held back so that the men who have not worked may receive the cars which they have previously refused. The equal turn is often unfair for this reason and reduces the output of the men.

But there is another inequality in the equal turn, and this acts directly, not only to reduce the average wage, but to create inequalities in earnings. A man who has an abnormal place, such as a heading, room neck or crosscut, a place with dirty coal, a room where the top or bottom must be ripped or a chamber with a bottom coal which lifts with difficulty gets pay for the disadvantages under which he works. He also gets the equal turn.

Consequently he gets more pay than the man with the absolutely normal place to whom is given only the regular tale of cars. He could load more and should do so as the conditions are favorable, but the inexorable law is equality of cars even where the result is far from an equality of earnings.

It is true, of course, that the inequalities are in themselves often quite fair. The entry driver should be better compensated than the miner, for he is usually a more skillful workman. But in other cases the rule works the other way, and the man drawing pillars, who is risking his life in a place not the safest, and who is a clever workman or he would not be trusted in such place, is paid no more for his services than the man who has just come to America and who consequently has been given the safest place imaginable where he is least likely to do any damage to himself or anyone else.

The equal turn with all its inequalities is a good provision and swept away many undoubted abuses of which the drivers and even the foremen were often guilty. Consequently the union cannot be blamed for enforcing it. The operator also has little cause to condemn it, because it puts a premium on work in undesirable parts of the mine and makes it easy to get them manned. If the work in difficult places was not a pure gain over and above what could be earned by filling the equal tale of cars—a sort of tip as payment for undesirable conditions—the operator would have to pay heavily for such work.

But this is not the only fault that can be found with the attitude of the writer of the article under consideration, for a protest should also be raised against an assumption too often made recently that because a loader could shovel 20 tons in a day such an output should be expected as an average from end to end of the country. There are places with low coal, where bottom has to be lifted, where shoveling is difficult or where double-shoveling is necessary. In others draw-slate falls and in still others the lifting of bottom coal takes time. In most cases the loaders have to drill their coal, load the holes and shoot them, and in all cases timber the roof and lay track. Furthermore if there was a driver at hand at all times there would be some loss of time at every exchange of empty for loaded cars.

The efficiency experts are faced with a difficult situation. Their work, owing to the operation of piece-work payments, is largely limited to transportation, powerhouse and dumping problems and in bituminous workings does not cover over 20 per cent. of the whole cost of mining. It is true that with more bosses the whole mining operation might be more efficiently handled, but as the operator is not the party most at interest he is unwilling to cure the situation by decreasing his meager profits or increasing his losses, as the case may be.

It is doubtful in most cases whether he could save the cost of the additional bosses by the savings they would insure. More supervision often means more friction. In some cases this appears between bosses and men, and in other cases between the foremen employed. It is not infrequent to find the inside and outside mine foremen in ill-disguised antagonism.

But the efficiency expert is confronted with another difficulty. If he succeeds in getting more cars to the working faces he may find himself face to face with the prospect of a short day. He will find that the miners will all be at the baseball game in the afternoon when the drivers are trying to secure a trip. This is quite a frequent trouble, and one reason for the slow run of the drivers is frequently the fear that the boss will declare the run at an end after only six or seven hours. The gain of the miner thus injures the company man.

In short we can see scarcely any hope for improvement except in *motive*. If the workmen can be made to seek thrift, to recognize that productivity is a duty owed to the people at large, to realize their parts as cogs in the industrial wheel and understand that the machine will run ill if they do not interpose at the exact moment when their work is in demand, then we can get results. The duty of the operator to sell cheap coal is preached from the housetops; the obligation of the miner is not less obvious. There is no reason why he should not know that he is a citizen with obligations.

The hope of any industry is in the character of its men. If they are anxious to work, have a strong coöperative sense, use judgment and inventiveness, there is hope for success. But if they seek to do a minimum and if they find opportunities to block progress, no solution can be found for the evils from which the industry suffers, especially when men are paid by the piece. Of course there always remains the possibility that gang work may be introduced into mining. Then supervision will be easier and cheaper and personal responsibility may be felt in mining as it is in other industries which are closely supervised.

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Men and Machines

Every part of a machine is designed for a certain purpose. The purchaser is convinced that every unit in the design is placed in the machine to perform some definite work. If it does not do it, then the purchaser carefully tries to find out why, and if he finds or thinks he finds that something is wrong in design or assembling, he rights it or tries to do so. It is the recognized way in 1915. He knows no other, unless it be to telephone the manufacturer.

But it used not to be so—when a man bought a machine he believed that it was impossible that he could remedy its failings. He flung it away and rained imprecations on it as children will deal with a watch which won't run. That was many years ago, and somehow the idea has spread since then that a man who can't run a machine he has bought is a fit victim for raillery. That can be readily noted when a man is tinkering on his automobile or bicycle and cannot make it work. He is the sport of all those who can handle their machines successfully and more especially of those whose misfortune or luck it has been never to own a machine.

But the operator or manufacturer takes no such view of the human element in his machinery. He immediately condemns the shortcomings of the man who gives him trouble without scheming a way of preventing them. It has not yet come to the time when the discontent and strikes and incompetence of the employees are regarded as evidences of poor management. To an extent, that is what they are. They show that something has been wrongly handled and are evidence of our failure to control matters or there would be no "knock" in the operation of our engine.

The art of handling men, or of helping them to handle themselves, is the great art of management. The clever change in assembling which gives the most efficient use of steam in a cylinder is not more subtle than the tact which makes a mine work without friction.

The boy, Alexander Potter, who attached the valves to the walking beam so that he would not have to open them himself at every stroke of Watt's engine is a fit model for the manager, who should never try to create a machine in which he himself is an integral part, but one which will work well while he is not there and one which is so fittingly put together that it will control itself. He, like the boy, must build himself *out* of the machine.

A contrivance which will work without watching is the aim of the manufacturer. Such automaticity should be the object of the mine manager, and it can only be reached if he somehow succeeds in getting men of character or creating them from indifferent material. The work of a mine manager is to select and train men—not assistant managers and foremen only, but miners.

We have only just begun the work of training. We are at the early period of evolution; we have learned how to cast off and to imprecate our laboring men. But when are we really going to learn to adapt our labor as we would adapt a machine to our needs and ideals? When are we even going to assemble it according to the best principles and give every man the work which suits his mental makeup?

When at last we conclude that we are even more responsible for the organization we build up than for the machinery we buy, then will be completed that great work the starting of which characterizes the early part of the Twentieth Century. For want of a better term, this innovation is dubbed welfare work, which, being interpreted, is the art of preparing men for their duties.

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New Form of Coal Storage

It has been suggested that the mines which are operated by steam shovels can keep steadily at work regardless of the demand for coal by utilizing the dull months of the year—when there is no demand for domestic fuel—in partially stripping the cover from the coal, the operation of mining being completed with great rapidity as soon as the demand for coal makes the mining of it desirable.

In this way the coal does not in any way deteriorate. It is true that the stripping is made a little more difficult as it is harder to find a place for the material removed. Like all stocking at the mines, it is not desirable for the railroad. Transportation companies with limited equipment are not pleased to see facilities for meeting such demands, as it assures them of a large tonnage in the seasons when they are least able to handle it.

Discussion By Readers

Value of Coal Analyses

Letter No. 2—The inquiry of N. G. Near, Coal Age, June 19, p. 1072, is one that many others interested in the coal industry have no doubt asked themselves many times. In entering upon this discussion I will state my viewpoint, which is that of a coal analyst who performs the tests and who is in a measure responsible for the correct interpretation of the results he obtains.

The uninformed coal-buying public do not seem to realize that the testing of their fuel should be done regularly, systematically and efficiently, not so much to find out that they are being imposed upon, but rather to show that they are imposing upon themselves. The value of coal analyses is such a vital question and of such growing importance that it is well worthy of a comprehensive discussion by mine operators, coal purveyors and consumers and the industry at large. The great practical importance of a coal analysis is in the control it exerts on the operations using this kind of fuel. Think of the constant repetition of analyses and routine chemical work done to determine the value of the output of metal and ore in steel and cement mills and metal mines. How long would these run nowadays without the guidance of the daily analyses of their materials and products?

The calorific determination of a fuel is a boiler-room necessity in plants using mechanical stokers and other modern combustion appliances. A slight variation in the composition of the coal would cause irregularities that in turn affect the entire plant. The cost of the analyses may at first seem high, but when carefully considered and apportioned among the different departments it is almost negligible in comparison with the benefit derived by so doing. In my own experience I have known times when an advance analysis of the fuel was a decided necessity and averted considerable worry and inconvenience, to say nothing of the loss of time in the operating schedule.

For the benefit of smaller consumers I would propose that it should be the office of the coal-sales agency to furnish analyses of all shipments of, say, 100 tons and over. A sales agency has the handling of perhaps several brands of coal from as many different districts, and it would be better to concentrate the analytical work in one well-equipped coal-testing laboratory, capable of taking care of a lot of combined work, instead of having a multitude of small and inefficient testing laboratories. To impose this duty of testing coal on the mine operator, as suggested by Mr. Near, is hardly just unless his commodity can be sold at an increased price. The operator's endeavors are centered on bringing the coal to the tipple in as good form and as uniform as his seam of coal and operating conditions will permit. It should be the duty of the sales agency to exploit the quality of the coals it offers on the market, substantiating the claims by reliable analyses.

It is possible to show how fuel can be saved by securing greater efficiency in power plants only by knowing the purity and character of the coal. The evaporation or boiler test indicating a lack of efficiency in any given plant is of no value unless we know the calorific value of the coal used in the test. Accordingly if we wish to know the daily efficiency of a boiler-room equipment we must have the daily routine laboratory tests. If we wish to be thorough and scientific in the conversion of the energy of coal into power, we must pay for it. In the study of engine-room chemistry we must first become thoroughly acquainted with the composition and properties of the coal, and this can only be ascertained by analyses.

Bykem.

——, Ill.

Longwall vs. Room-and-Pillar Mining

Letter No. 1—I have read with interest the articles on longwall mining that have recently appeared in Coal Age. None of these letters, however, has gone far enough to indicate the advantage of this system of mining over the room-and-pillar systetm.

The discussion in Coal Age has aroused a controversy here between the adherents of these two systems of mining. The room-and-pillar advocates claim that their system can be safely adopted under all conditions, while the longwall plan is limited and confined to localities that have a hard roof and bottom and cannot therefore be safely adopted anywhere and everywhere.

If these claims be true, it must be acknowledged that there is little encouragement to experiment with the longwall system of mining, which must hold out at least a promise of decided advantages over the other systems in order to make such experiments worth while and of interest to mining men.

The longwall advocates, on the other hand, claim that the average cost of coal production in Iowa and Missouri, by the room-and-pillar system of mining, is $1.40 per ton and that 60 per cent. of lump coal is produced, the remaining 40 per cent. of the output being screenings. They contrast this cost of production under the room-and-pillar system with a cost of from $1.20 to $1.25 per ton under the longwall system of mining in the same states, which they say yields 90 per cent. of lump coal.

As a result of this controversy a little dinner is at stake, and it has been decided to submit the question to Coal Age for its decision as to who shall pay for the dinner. The question to be decided is, Has the longwall system the indicated advantage over the room-and-pillar system of mining, assuming that the physical conditions in the seam will admit of the adoption of the former method.

Fred Morck.

Tuscaloosa, Ala.

[In response to the above request, we would suggest that it would be manifestly unfair for Coal Age, not having heard the arguments presented, to decide the question, as to who shall pay for the dinner. We would suggest that the advocates of both of these systems of mining present their arguments for discussion in Coal Age. Such a discussion would be of great interest to all readers and would probably be a greater benefit to the advocates of both systems than the proposed dinner. It may be stated with assurance, however, that where the conditions are favorable, longwall work properly conducted will fully justify the claims here presented.—Editor.]

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Stopping Payroll Leaks

Letter No. 5—Some very interesting points were brought out by H.R.K., in Letter No. 4, Coal Age, June 5, p. 990. The conditions named in that letter are very close to those under which we are working at the present time in our mines. We are recovering ribs and stumps that have been standing from two to six years. The work entails much expense that could have been saved had it been done at the proper time.

I want to mention another source of expense that can often be avoided by a little foresight and judgment on the part of the foreman. It often happens that the roof slate in a mine is weak and troublesome in spots. When this is the case, the usual practice or custom is to timber the entry through such places. This is done as a matter of course, without giving a thought to the question of the relative cost of timbering such a stretch of roadway and that of taking down the loose top and removing from the mine what is not needed for building the stoppings in the crosscuts. When the roof slate is overlaid with a hard rock or shale, it will generally be found much cheaper to take it down than to secure it with timber.

In my experience I have often asked myself the question, Does it pay to timber such places? and I have invariably come to the conclusion that it does not. In most cases it will be found that the cost of securing such dangerous spots in an entry by suitable timbering would more than pay for removing the loose material, and in addition there would be secured a permanent good roof, while the expense of renewing timber from time to time as required would be avoided.

It often happens that it is impracticable to take down such bad roof in an entry, as for example under shallow covering or where the roof slate is overlaid with soft material that would "cut." These cases, however, are comparatively few in many coal-mining districts. In the mine where I am at present employed the roof conditions are generally good, but soft spots occur at different points. There is the ordinary drawslate with from 8 to 10 in. of roof coal, above which is a black slate resembling a soft soapstone and varying from 1 to 8 ft. in thickness. It is this stratum that causes the trouble when it becomes soft or tender as it does in places.

A short time ago I had occasion to handle one of these soft spots in a butt entry where the roof had been timbered five years before. The work on this entry was being drawn back, and the entry pillars and stumps had been removed to within 300 ft. of the main-entry pillar. At this point the roof between the main entry and the first room became dangerous, and it was necessary to remove the entire loose material by placing a stick of carbonite on the end of a timber set. The shot blew out seven sets of 10x10 timber, and from 30 to 35 tons of slate came down. To remove this material required the work of two men for 17 hr., making a total of 34 hr. at 32.5c. per hr., costing $11.05. This did not include the cost of haulage and dumping the material, which was a matter of little moment in this case as the facilities for handling the dirt were excellent.

Compare this with the original cost of timbering this place. Each set of timber consisted of two 7-ft. legs and one 8-ft. cap of heavy 10x10-in. sticks . These were oak-lagged with old props reinforced with four 40-lb. steel rails. It may be estimated that the work of setting these timbers would require seven days for two men at $2.60 per day, making a total of 14 × 2.60 = $36.40. To this must be added the cost of the timber, say $3 per set, or $21 making the total cost $57.40. If this material had been removed at the start, the expense of removal would have been $11.05, as given; but owing to its having been timbered and later removed, the total expense was the cost of the timbering and its later removal. In other words, the cost of the timbering and the material used ($57.40) would have been saved by a little foresight or judgment.

In the development of a mine it will often happen that there are met a number of such places where the same saving of expense, or even a larger amount, can be effected by removing the loose material at once instead of attempting to secure these places with timber. Where timber is used, it must be remembered that it will be necessary to replace much of it before the road is abandoned. The work of retimbering a road will often exceed the original cost of setting the first timbers, as in many cases heavier timbers will be required.

F. M.

Meadowlands, Penn.

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Rail vs. Water Freights to Pacific Coast

Referring to the inquiry of H. C. Marchant, sales manager for the Lion Coal Co., which raises some interesting questions, I would offer the following suggestions:

Competition of Wyoming and Utah coals for the North Pacific coast trade involves other questions than the mere cost of shipping and delivering of coal from the Atlantic States to the Pacific Coast. The points necessary to be considered may be summed up as follows:

1. The tonnage involved, depending on the consumption of coal in the U. S. Pacific coast markets. 2. The coals competing for this trade, their source, quality, availability and cost. 3. The cost of each coal at points of consumption. 4. The method and cost of handling, discharge and delivery from ship or cars. 5. The competition of other fuels with coal.

On these various points, I offer the following as the best information available at the present time:

1. Government reports, trade statistics and other like sources give an approximate idea of the consumption of coal along the United States Pacific Coast, at least as far as covering the most important markets. This information may be summarized as follows:

San Francisco—The receipts of coal, in 1914, totaled 373,095 tons, derived from the following sources:

Foreign countries: British Columbia, 97,598 tons; Australia, 123,050 tons; Japan, 25,077 tons; Great Britain, 13,421 tons; China, 1000 tons.

Home supply: Washington, 12,637 tons; Oregon, 73 tons; East, by rail and water, 100,239 tons.

This shows a total of 260,146 tons, or 69.7 per cent. of the total coal consumption as coming from abroad, while only 112,949 tons is supplied by home operations, and 60,000 tons of the last item was used by the United States Navy.

The coal consumption of San Francisco has steadily decreased from 593,164 tons in 1911. This decline began in 1900 when the consumption was nearly two million tons.

Portland—The coal consumption of Portland amounts to about 100,000 tons per year, the coal coming mostly from Washington, Wyoming, Utah and British Columbia. Wood and oil are strong competitors for fuel in this market.

Seattle—The receipts of coal by water at Seattle, during 1914, amounted to 45,113 tons from British Columbia, 473 tons from Alaska, and 4730 tons from the Atlantic Coast. Oil is a strong and growing competitor here also.

Since the first of the year there have been a number of cargoes of coal shipped to the Pacific Coast, including two cargoes of anthracite; but most of this coal has been for the use of the navy, which is increasing its supplies of coal at the naval stations.

Whether the opening of the Panama Canal will enable Atlantic Coast coals to compete to any extent for the North Pacific markets is very doubtful, unless ocean freights are materially reduced.

It is likely that the imports of Australian coal will be considerably reduced during this year and this would afford an additional opportunity for the Wyoming and Utah coals to reach the Pacific Coast.

2. In an article published in Coal Age, Vol. 5, pp. 888 and 1003, entitled "Effect of Panama Canal on World's Coal Markets," I gave some analyses of competitive coals on the Pacific Coast, which may be used here:

	Moisture	Volatile	Fixed Carbon	Ash	Sulphur	B.t.u.
Australian	1.32	40.47	52.58	5.63	1.23	14188
Australian	2.01	36.01	58.27	8.71	0.47	13300
Japan, Chikuho	4.21	42.92	45.71	7.33	0.68	12965
Vancouver Islands	1.16	40.47	50.04	7.80	0.53	13410
Vancouver Islands	1.00	29.00	57.20	11.90	0.90	13010
British Columbia	....	26.30	64.70	9.00	0.50	13820
British Columbia (washed coal)	....	25.20	68.60	6.20	0.50	14310
Best New River	1.107	20.50	73.37	4.96	0.828	15033
Washington, Renton	.....	38.54	48.19	13.27	0.84	11911
Washington, Roslyn	.....	36.76	50.36	12.88	0.36	13056
Washington, Carbonado lump	.....	35.65	53.26	11.09	0.71	13480
Utah, Castlegate	.....	42.69	48.41	8.90	0.60	13014
Utah, Kenilworth	.....	42.70	52.32	4.98	0.33	13590
Utah, Winterquarters	.....	43.75	49.96	6.29	0.94	13237
Wyoming, Dietz	.....	40.91	52.58	6.51	0.97	12328
Wyoming, Monarch	.....	46.05	49.63	4.32	0.77	12559
Wyoming, Sheridan	.....	47.00	45.02	7.98	1.08	11599
Wyoming, Superior	.....	36.55	58.58	4.87	1.51	13250

The availability of any of these coals for the Pacific Coast trade depends wholly on the nature of the intended use. It must also be remembered that there is likely to be some anthracite shipped from the East and that there has always been a trade in smithing coals from the Atlantic seaboard, mostly in Georges Creek coal.

3. No data on freight rates from Wyoming and Utah points to the Pacific Coast are available. The present price of Eastern coals, New River and Pocahontas, for tidewater shipment is $2.85 per gross ton, f.o.b. Hampton Roads, although this price can be shaded probably, as the Navy Department has just closed a contract for Pocahontas coal at $2.60, f.o.b. tidewater, the rail freight from the mines being $1.40. Ocean freight rates from Atlantic Coast ports to North Pacific ports are very high now, as might be expectetd. Charters made during the last three months run from $6.46 to $7, while a year ago they were as low as $3.39 per ton.

4. No data are available regarding the relative cost of handling rail and water shipments at San Francisco or other Pacific ports.

5. The competition of oil as fuel has greatly reduced coal consumption on the Pacific Coast, so much so that practically the only market for coal is the domestic market and the foreign bunker trade, and even the latter has been considerably decreased of late years.

The United States Geological Survey estimated that at the close of 1913 the consumption of fuel oil in markets tributary to the Washington coal mines has displaced 5,000,000 tons of coal. It was also estimated that to perform the service rendered by California petroleum in the production of heat and power and in making gas it would require about 18,000,000 tons of coal.

In Western Oregon, generally, wood is the principal fuel for all purposes. At Portland oil is the fuel used for steam and gas making, wood being used for domestic heating. Good cordwood can be bought in this section as low as $3.75 per cord and slabs from the lumber mills at $2.25.

It is obvious from the above that the coal markets on our Pacific Coast are not large and will not be until oil production is materially decreased and its price for fuel increased. Under any circumstances, the Wyoming and Utah coals will find it difficult to compete with Australian and British Columbia coals, unless the exports of the two latter sources of supply are materially decreased by the present war or unless rail freights on the inland coals are cut down to a competitive point. The Vancouver coals for instance have but 940 statute miles of water transportation to San Francisco, while from Ogden to San Francisco is 786 miles by rail. In normal times the Vancouver coals sell for $6.90 trimmed in bunkers. The Australian coal, although coming from a great distance, is carried very cheaply.

I have no data as to freights between Australia and San Francisco, but Australian coal freights to Valparaiso, Chile, a distance of 6280 nautical miles, have been as low as $4.25 (1914), and the Chilean railways contract for 1915 was taken at $7.66 per metric ton for Australian coal. As the distance from Australia (Melbourne) to San Francisco is 6966 miles, it would seem that Australian coal can be sold there at about as low a price as in Chile.

As regards competition of Atlantic Coast coals, it is the writer's opinion that not much effort will be made by coal agencies in the East to enter the North Pacific markets, except for navy business. At the present ocean-freight rates, they cannot compete; and even when freights are low, they would have difficulty in competing with the British Columbia coals. Of course this does not apply to coals for special purposes, such as blacksmith and anthracite. The competition of Alaska coals in the Pacific markets outside of Alaska, about which so much was said a few years ago, need not be taken seriously and is not likely to amount to anything, owing to mining and transportation difficulties and costs.

F. R. Wadleigh.

Philadelphia, Penn.

Reducing Ventilation When Firing in Mines

Letter No. 2—Referring to Alexander McAllister's letter, Coal Age, June 19, p. 1070, on this subject, I would like to ask him to tell us how a current of air is to be forced into an entry "under pressure" when the entry is "open at both ends."

I have had considerable experience in fighting mine fires and working in all kinds of contaminated air in mines. I have never, however, observed such a phenomenon as Mr. McAllister describes—a column of pure air in the center of an entry and surrounded by afterdamp. I believe there are other factors that exert a greater influence on the distribution of the air in the sectional area of an entry than the friction against the roof, floor and ribs of the entry.

For example, if the temperature of the air in the mine is high as a result of a fire or local explosion, and the outside temperature is low owing to cold weather, the fresh cold air entering the mine will flow along the floor of the entry, until it gradually becomes warmer and mixes with the other air or forces it ahead. This is especially the case where the air current is not sufficiently strong to force the dead air of the entry ahead, as often happens in time of emergency.

But, again, on a warm summer day a small intake current of fresh warm air will generally be found to flow along the roof of the entry, and this will be particularly manifest where the air in a mine has been standing and is cool, and especially when the mine air is laden with carbon dioxide or blackdamp. I have frequently observed both of these conditions.

While admitting that reducing ventilation when firing in a mine will no doubt lessen the magnitude of an explosion should one occur, I cannot believe that such procedure will prevent an explosion from taking place when other conditions favor its occurrence. It is important to remember in this connection that, in a mine generating large volumes of firedamp, any reduction of the ventilation will allow enough explosive gas to accumulate in a brief time to cause an explosion when ignited by the flame of a blast.

My conclusion is, therefore, that the question of reducing ventilation at firing time must be determined by the condition of the mine in respect to firedamp. I may be pardoned for stating that, in my humble opinion, Mr. McAllister may yet have an explosion under the same conditions that he now claims render the mine immune from such an occurrence.

Edward H. Coxe.

Knoxville, Tenn.

Study Course in Coal Mining

By J. T. Beard

The Coal Age Pocket Book

At each change of state in matter heat is either absorbed and becomes **latent in the mass,** or is given out and becomes **sensible,** causing a rise of temperature in the surrounding medium. **Heat is absorbed** when a solid becomes a liquid or a liquid becomes a gas ,the change being one in which the density of the mass is made less. On the other hand, **heat is given out** when a gas is condensed to a liquid or a liquid to a solid, the density of the mass being then increased.

Heat of Fusion—The change from a solid to a fluid state is described as **"liquefaction"** when solution takes place, or **"fusion"** if the solid is melted. The heat absorbed in the latter case is called "heat of fusion."

Liquefaction may take place as the result of the absorption of moisture from the air, the substance dissolving either wholly or in part in the water absorbed. Such a substance is said to be **"deliquescent."**

Solution takes place when a solid disappears in a liquid in which it is immersed. The solid is "dissolved" in the liquid, which is called the **"solvent."**

In any case of liquefaction or fusion heat is absorbed and becomes latent in the liquid, causing a seeming loss or **disappearance of heat.** When a solid is dissolved in a liquid the liquid is cooled provided no chemical reaction takes place, which might produce heat.

Heat of Vaporization—The formation of vapor or the change from a solid or liquid to a gaseous state is known as **"vaporization"** and the heat absorbed and rendered latent in the vapor is called "heat of vaporization" or frequently "heat of evaporation," especially when the vapor is formed by boiling the liquid.

Heat of Condensation—When a gas or vapor is condensed to a liquid or a liquid is frozen or condensed to a solid the latent heat of the gas, vapor or liquid is given out and appears as sensible heat, which causes a rise of temperature. The heat given out is called "heat of condensation" and is exactly equal to the heat of vaporization or the heat of fusion or liquefaction, as the case may be.

Total Heat in a Body—By this is meant the total heat absorbed by a body in a given change of temperature or state. For example, the total heat in 1 lb. of water, in passing from ice at 32 deg. F. to steam at 212 deg. F. is as follows:

Latent heat of fusion of ice, from and at 32° F.	144 B.t.u.
Sensible heat absorbed by water, 32° to 212° F.	180 B.t.u.
Latent heat of vaporization, from and at 212° F. ...	966 B.t.u.
Total heat absorbed	1290 B.t.u.

The total heat of steam at any temperature or pressure is usually estimated from water at 32 deg. F.; thus the total heat in steam (water vapor) at 212 deg. F. is 180 + 966 = 1146 B.t.u. This is the heat in steam at atmospheric pressure at sea level (14.7 lb. per sq.in.). When steam is generated in a boiler, its temperature increases with the pressure.

The Coal Age Pocket Book

TABLE SHOWING CORRESPONDING VALUES OF THE FAHRENHEIT SCALE, FOR EACH FIVE DEGREES OF THE CENTIGRADE SCALE

C.	F.	C.	F.	C.	F.	C.	F.	C.	F.
—50	—58	200	392	450	842	700	1292	950	1742
—45	—49	205	401	455	851	705	1301	955	1751
—40	—40	210	410	460	860	710	1310	960	1760
—35	—31	215	419	465	869	715	1319	965	1769
—30	—22	220	428	470	878	720	1328	970	1778
—25	—13	225	437	475	887	725	1337	975	1787
—20	—4	230	446	480	896	730	1346	980	1796
—15	+5	235	455	485	905	735	1355	985	1805
—10	14	240	464	490	914	740	1364	990	1814
—5	23	245	473	495	923	745	1373	995	1823
0	32	250	482	500	932	750	1382	1000	1832
+5	41	255	491	505	941	755	1391	1005	1841
10	50	260	500	510	950	760	1400	1010	1850
15	59	265	509	515	959	765	1409	1015	1859
20	68	270	518	520	968	770	1418	1020	1868
25	77	275	527	525	977	775	1427	1025	1877
30	86	280	536	530	986	780	1436	1030	1886
35	95	285	545	535	995	785	1445	1035	1895
40	104	290	554	540	1004	790	1454	1040	1904
45	113	295	563	545	1013	795	1463	1045	1913
50	122	300	572	550	1022	800	1472	1050	1922
55	131	305	581	555	1031	805	1481	1055	1931
60	140	310	590	560	1040	810	1490	1060	1940
65	149	315	599	565	1049	815	1499	1065	1949
70	158	320	608	570	1058	820	1508	1070	1958
75	167	325	617	575	1067	825	1517	1075	1967
80	176	330	626	580	1076	830	1526	1080	1976
85	185	335	635	585	1085	835	1535	1085	1985
90	194	340	644	590	1094	840	1544	1090	1994
95	203	345	653	595	1103	845	1553	1095	2003
100	212	350	662	600	1112	850	1562	1100	2012
105	221	355	671	605	1121	855	1571	1105	2021
110	230	360	680	610	1130	860	1580	1110	2030
115	239	365	689	615	1139	865	1589	1115	2039
120	248	370	698	620	1148	870	1598	1120	2048
125	257	375	707	625	1157	875	1607	1125	2057
130	266	380	716	630	1166	880	1616	1130	2066
135	275	385	725	635	1175	885	1625	1135	2075
140	284	390	734	640	1184	890	1634	1140	2084
145	293	395	743	645	1193	895	1643	1145	2093
150	302	400	752	650	1202	900	1652	1150	2102
155	311	405	761	655	1211	905	1661	1155	2111
160	320	410	770	660	1220	910	1670	1160	2120
165	329	415	779	665	1229	915	1679	1165	2129
170	338	420	788	670	1238	920	1688	1170	2138
175	347	425	797	675	1247	925	1697	1175	2147
180	356	430	806	680	1256	930	1706	1180	2156
185	365	435	815	685	1265	935	1715	1185	2165
190	374	440	824	690	1274	940	1724	1190	2174
195	383	445	833	695	1283	945	1733	1195	2183

Inquiries of General Interest

Ventilation Problem

I desire to submit a problem in mine ventilation that has given us considerable anxiety in reference to the future development of the mine where I am employed. Our proposition is somewhat peculiar because of the fact that the property is only 1400 ft. wide, while the coal is thin, varying from 21 to 24 in. in thickness. The mine has been developed by driving a pair of main entries through the center of the property and turning cross-entries at right angles to the main entries every 300 ft. At the present time the first pair of cross-entries is at a distance of 4500 ft. from the shaft. We aim to keep 5 pairs of cross-entries open on each side of the main entry, making 10 pairs of cross-entries, each pair being 700 ft. long when driven to the boundary. The main entries are practically 6000 ft. long from the shaft to the face. All the entries are 5x6 ft. in section, giving a sectional area of 30 sq.ft.

In the ventilation of this mine it has been our custom to obstruct the main intake current at the mouth of each pair of cross-entries, so as to circulate from 3000 to 4000 cu.ft. per min. in each pair of these entries. Owing to the narrowness of the property and the thinness of the seam, it is impracticable to build overcasts and split the air current. For this reason the mine is ventilated by a single continuous current that passes through the main intake from the shaft to the face and returns through the main return air course to the upcast, a sufficient scale of air being taken off this main current for the ventilation of each pair of cross-entries, as previously mentioned. From this description it will be seen that the total length of the main current, including the return, is 12,000 ft., the sectional area 30 sq.ft., and the rubbing surface 264,000 sq.ft. The 10 pairs of cross-entries represent a total length of approximately 14,000 ft., with a sectional area of 30 sq.ft. and a rubbing surface of 308,000 sq.ft.

The present circulation of air is insufficient for the satisfactory ventilation of the workings, and I want to ask what the maximum quantity of air is that can be circulated on this plan under a 6-in. water gage; also, what you can advise as the best method of handling this proposition in order to get a circulation of 20,000 cu.ft. of air per min. in the mine.

Alexander Jeffrey.

Bay City, Mich.

In attempting to answer this question, it is well to estimate approximately what circulation of air will be produced by a 6-in. water gage under the plan described by the correspondent. Not knowing definitely the character of the mine in respect to the straightness of its airways, their condition and the amount of timber employed, we will use the modified Atkinson coefficient, $k = 0.00000002$, which will be safer under the circumstances than the Fairley coefficient, $k = 0.00000001$. We will assume a scale of 3600 cu.ft. per min. passing through each pair of cross-entries and returning directly to the main current. The total pressure absorbed by the circulation in the 10 pairs of cross-entries, on this basis, is

$$p = \frac{0.00000002 \times 308{,}000 \times 120^2}{30} = 2.95 \textit{ lb. per sq.ft.}$$

A 6-in. water gage corresponds to a pressure of 6 × 5.2 = 31.2 lb. per sq.ft. Hence, assuming a 6-in. water gage for the entire circulation in the mine, the pressure producing the circulation in the main entries is 31.2 — 2.95 = 28.25 lb. per sq.ft. The quantity of air this pressure will circulate in the main entries is

$$q = 30\sqrt{\frac{30 \times 28.25}{0.00000002 \times 264{,}000}}$$
$$= \textit{say } 12{,}000 \textit{ cu.ft. per min.}$$

The practical aspect of the problem would suggest, first, to clean up all airways, enlarge breakthroughs and straighten air courses and wherever possible shorten the distance of air travel by carrying the air through rooms that have holed into each other from adjacent pairs of cross-entries. Aside from these suggestions, however, if the quantity of air in circulation is still insufficient for the thorough ventilation of the mine, the best solution of the problem will be found in sinking an air shaft at or near the head of the main entries. This would make it possible to use both the main entries as intake air courses for their respective sides of the mine. In other words, it would then be possible to ventilate each side of the mine with a separate air split, coursing the air through consecutive pairs of cross-entries, as before, in each split. The pressure required to circulate 20,000 cu.ft. of air through the main entries from the downcast to the upcast shaft at the face, a distance of 6000 ft.—the total sectional area, or area of passage, being then 60 sq.ft. and the total perimeter, 44 ft., which makes the rubbing surface as before 6000 × 44 = 264,000 sq.ft.—is

$$p = \frac{0.00000002 \times 264{,}000 \times 20{,}000^2}{60^3} = 9.77 \textit{ lb. per sq.ft.}$$

For better ventilation of the cross-entries, we will now assume a velocity of the air current in these entries equal to 300 ft. per min., giving a scale of air of 300 × 30 = 9000 cu.ft. per min. in each pair of cross-entries. Since the air is traveling in two separate splits, it is only necessary to calculate the pressure for five cross-entries on one side of the mine, which have a sectional area of 30 sq.ft. and a rubbing surface of 154,000 sq.ft. Hence, the pressure absorbed in the circulation of 9000 cu.ft. per min. in each pair of cross-entries is

$$p = \frac{0.00000002 \times 154{,}000 \times 9000^2}{30^3} = 9.24 \textit{ lb. per sq.ft.}$$

The total pressure required in this circulation is therefore 9.77 + 9.24 = say 19 lb. per sq.ft., which corresponds to a water gage of 19 ÷ 5.2 = 3.6 in. In this calculation, we have disregarded the resistance of the shaft, which would have to be taken into account if of any considerable depth or limited in sectional area.

Examination Questions

Illinois Examination for Mine Managers, June 14, 1915

(*Selected Questions*)

Ques.—The hammer of a piledriver weighs 20 cwt. and reaches the pile with a velocity of 30 ft. per sec.; find the kinetic energy.

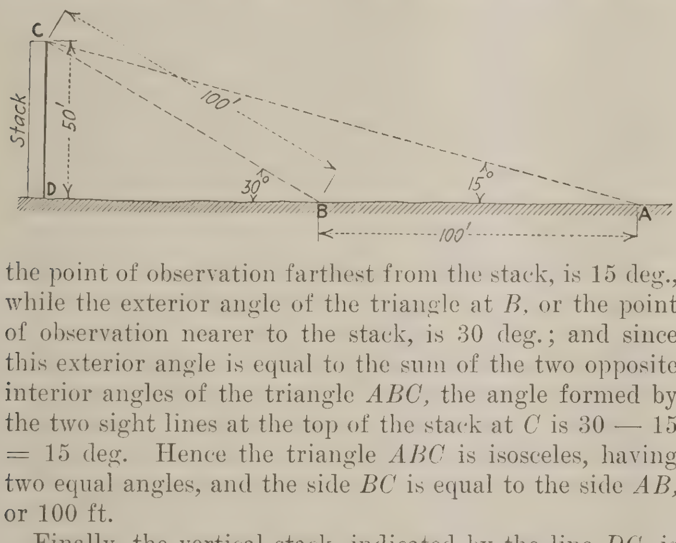
Ans.—The kinetic energy of a moving body is one-half the product of the mass of the body and the square of its velocity expressed in feet per second. The mass of a body is equal to its weight divided by the force of gravity expressed in feet per second. Taking the force of gravity as $g = 32.16$ ft. per sec., the kinetic energy is

$$\text{Kinetic energy} = \frac{2000 \times 30^2}{2 \times 32.16} = 27{,}985 \textit{ ft.-lb. per sec.}$$

Ques.—The angular height of a stack was found to be 15 deg., and at a point 100 ft. nearer it was observed to be 30 deg. What is its actual height?

Ans.—Assuming that these observations are taken from points having the same elevation, the line joining the two points of observation is the base of a triangle in which one side and all its angles are known.

Referring to the accompanying figure, the side *AB* of the triangle *ABC* is 100 ft. The interior angle *A,* being the point of observation farthest from the stack, is 15 deg., while the exterior angle of the triangle at *B,* or the point of observation nearer to the stack, is 30 deg.; and since this exterior angle is equal to the sum of the two opposite interior angles of the triangle *ABC,* the angle formed by the two sight lines at the top of the stack at *C* is 30 — 15 = 15 deg. Hence the triangle *ABC* is isosceles, having two equal angles, and the side *BC* is equal to the side *AB,* or 100 ft.



Finally, the vertical stack, indicated by the line *DC,* is the altitude of a right triangle whose hypotenuse is 100 ft. and the angle at the base 30 deg. The altitude of this triangle, or the height of the stack, is then one-half the hypotenuse, or 50 ft., since the sine of 30 deg. is 0.5, or one-half.

Ques.—What is the accepted theory as to the origin of coal? Assuming this theory to be correct, how do you account for the successive coal measures, one above the other, in this state?

Ans.—The generally accepted theory of the formation of coal is that the material constituting the coal measures was deposited on the surface in more or less level and consecutive layers. The material forming the coal beds was chiefly of vegetable origin, the result of successive seasons of vegetable growth and decay. Owing to internal or geological changes taking place in the earth's crust, there were successive risings and sinkings of the surface, which caused the successive inundation of different surface areas.

The deposits of vegetable matter were thus overflowed, and in this stage of the formation became covered with various other deposits of sand, limestone, clay and gravel or drift that often formed a conglomerate. The limestone was deposited from the calcareous matter carried in solution by the water that overflowed the area. These strata all contain fossils, which are the petrified remains of the bones of animals and different plants.

Other geological changes following caused the uprising of such flooded areas, which were again covered with a luxuriant vegetable growth that later deposited more coal-forming material. These successive geological changes made possible the successive deposition of the material forming the coal beds and the interstratified layers of rock, shale, sandstone, clay and conglomerate which form the coal measures. Other geological changes tilted the formations so that many of the beds are now inclined. The same changes exposed portions of the beds to erosion by surface streams and glaciers and caused many faults and displacements.

Ques.—What is the displacement or theoretical delivery in imperial gallons per minute of a three-ram pump, at a speed of 30 r.p.m., if the rams are 10 in. in diameter and have a stroke of 12 in.? If such a pump can empty a sump in 15 hr., after having been idle for 10 hr., what is the rate of inflow of water into the sump in imperial gallons per minute?

Ans.—The imperial gallon contains 277.274 cu.in., being larger than the U. S. standard or Winchester gallon, which is 231 cu.in. A pump having three plungers and running at a speed of 30 r.p.m. makes 3 × 30 = 90 strokes per min., assuming this style of pump is single-acting in its operation. The theoretical displacement is then $90\ (0.7854 \times 10^2)\ 12 \div 277.274 =$ *say 306 gal. per min.*

Assuming the sump was empty at the beginning of the 10 hours' idleness of the pump and that the latter could handle in 15 hours what ran into the sump in 10 hours, and allowing a slip of 15 per cent., or making the water-end efficiency of the pump 85 per cent. of the theoretical displacement, the inflow into the sump in imperial gallons is $306 \times 0.85 \times 15 \div 10 = 390+$ gal. per min.

Ques.—Given an arched airway, with semicircular arch 10 ft. in diameter, springing 5 ft. above the floor, and a velocity of air current equal to 500 ft. per min., what is the quantity of air passing in cubic feet per minute.

Ans.—The area of the rectangular portion of this cross-section is $5 \times 10 = 50$ sq.ft. To this must be added the area of the semicircle, which is $\frac{1}{2}\ (0.7854 \times 10^2) = 39.27$ sq.ft., making the total sectional area of the airway 89.27 sq.ft. If the average velocity of the air current is 500 ft. per min., the quantity of air passing in the airway is $500 \times 89.27 = 44{,}635$ cu.ft. per min.

Coal and Coke News

PENNSYLVANIA

Anthracite

Milton—Over $700,000 must be paid to the county and school districts in the county in tax money by the coal corporations having holdings therein. This money was held up pending the appeals from the tax revision boards increase of assessment, the subsequent appeals, and finally the supreme court. It is being paid in instalments. First $50,000 was paid, then $20,000, then $20,000 more, and so on. The school districts get most of the money while the county gets a small share.

Freeland—Claiming that the company failed to provide adequate safety appliances the Lehigh Valley Coal Co. has been made the defendant in a suit for $5000 brought by Mrs. Catherine Ferry of this place, to recover for the loss by death of her son, Daniel, in the Drifton mines of the company.

Wilkes-Barre—An action in assumpsit was recently started by Edward Fleming of Plymouth against the Kingston Coal Co., in which he attempts to recover $200 he claims for work done in the Gaylord mine of the company during February of 1892. He alleges to have blasted and loaded out about 200 tons of coal during the month before the "Gaylord disaster" occurred covering the place where the coal had been cut and loaded. He further alleges that in 1910 the coal prepared by him was recovered from the mine by the company and shipped to market; but that it has failed to pay him for the work he performed.

Scranton—One of the worst mine caves to occur in years took place recently in a territory that had been regarded as safe and free from underground workings. Every building in a considerable area on Jefferson and Adams avenues near Maple St. was badly damaged. One of the worst damaged buildings was that occupied by the 13th regiment armory where it was generally supposed that when the ground was acquired, the mineral rights went with it. There are now many fissures in the building about 3 in. in width while the entire structure was thrown out of plumb.

Production of anthracite during June fell below that of June, 1914, the majority of the collieries working only part time. Shipments of anthracite in June, 1914, amounted to 6,130,186 tons, but it is probable that for June, 1915, they will be about 400,000 tons less. The shortage for the first five months of 1915 was 536,401 tons, and it is thought that when the business for June is included, the deficit for the first half of 1915 will be nearly 1,000,000 tons less than the shipments over the same period of last year.

Pittston—A serious mine cave, west of the Taylor yards recently occurred which held up traffic for several hours and damaged a considerable portion of the double-track road bed of the Bloomsburg division of the Lackawanna R.R. This cave was discovered by yard men in time to send out warning. The cave occurred near the Old Forge and Taylor division line, and not far from the Forest Home cemetery.

The Pennsylvania Coal Co. recently posted notices informing the employees that thereafter no funds would be collected by the company for the relief fund which this firm has been carrying for many years. It is said that as soon as the surplus, which has been accumulated, is paid out to those members who have met with accidents in the mines, the fund will be abandoned. This move is probably the result of the passage of the compensation act by the recent legislature.

Almedia—Some of the coal dredges at work in the river at Almedia are being moved to Berwick where a bank of coal has been discovered in the river 3 ft. in thickness.

Hazleton—Kehoe & Co., mining contractor, who is in charge of the work of stripping a new operation for the Lehigh Valley Coal Co. at Scotch Valley, has been compelled to temporarily abandon the work. The 100 men employed by it went on a strike, alleging they had worked 9½ hr. a day and were only paid for a 9-hr. day.

D. J. Roderick, mine inspector in charge of the 11th anthracite district, who also acts as chairman of the examining board, has announced the result of the recent examination conducted by him for the position of foremen and assistant foremen. Fifty-one men participated in the examination and 37 passed. Of this number 11 qualified as foremen and 26 as assistant foremen.

Mahanoy City—Mine cave-ins at Yatesville recently so badly damaged the tracks of the Lehigh Valley R.R. that it was necessary to temporarily discontinue all railroad traffic and passengers were compelled to walk around the depressions to trains on the other side.

Bituminous

West Apollo—Fire supposed to have been caused by friction from the pulleys of the shaft at the Hick Coal Co. tipple near West Apollo, Westmoreland County, totally destroyed that building recently. There were 14 men working on the night shift and these were rescued with difficulty on account of the dense smoke. The fan house took fire and was consumed before the men emerged from the workings.

Connellsville—The Connellsville coke trade is increasing in volume. The production of the furnace ovens has risen to about 224,000 tons weekly, while the merchant production is 130,000 tons. The merchant operators are thus running at about 58 per cent. capacity while the furnace ovens are working at 74 per cent. Practically all of the independent coke operators in the Connellsville region have posted notices that the wage rate would be advanced to equal that of the H. C. Frick Coke Co. This rate is the highest ever paid, while there is a noticeable shortage of labor. Four hundred ovens have been ordered fired by the Frick company, while merchant ovens are being steadily added to the active list.

Evans Station—Between 25 and 30 coal miners went on strike recently at the plant of the Evans Coal & Coke Co. when their demand for a wage increase was refused. There was no trouble, however, and an amicable settlement was expected.

East Millsboro—One man was killed, four others were overcome by gas, and 42 had narrow escapes as the result of an explosion of gas in the Husted-Seaman mine on July 1. The one man killed, John Ward, was a pipe fitter, who was crushed under débris and suffocated by the after damp. The superintendent, fireboss, machine boss, and road boss were overcome by gas in an attempt to reach Ward. This mine employs about 150 men of whom 43 were in the pit when the explosion occurred. The fans were not injured by the force of the explosion and were immediately started operating at their full capacity. The cause of the explosion is not definitely known, but it is believed that a pocket of gas was ignited. No serious damage was done to the mine which will shortly be in operation again.

WEST VIRGINIA

Charleston—The deficit in the workmen's compensation fund now amounts to about $770,000. Operators have been paying the rate of $1 per $100 of pay roll. It is believed that for a time assessments against the operators must be placed at $2 for every $100 of payroll. This of course will be only temporary and would be graduated according to the amount of money which would have to be paid out by the commissioner. This rate is agreeable to most of the operators in the state, but those in districts where the death rate has been low object to such an assessment.

West Virginia has been redistricted for the inspection of mines, providing 15 districts instead of 12. This has been done in compliance with the new mining law passed by the last regular session of the Legislature. Three additional inspectors have been appointed.

Bluefield—The volume of coal shipments is still increasing, and from present indications it would appear that July will be another record month. It is said that never has the export trade been so great as now, recently Norfolk advanced to second place among the shipping ports of the country, it being said that this was largely due to the foreign coal shipments. Coal operators report that a new record will be established this month, probably the greatest in the history of the coal field.

Grafton—The Maryland Coal Co. is now operating its mines at Wendel full time and is hiring men to meet the demand for greatly increased business. The company is now loading from 90 to 100 cars of coal per day.

TENNESSEE

Knoxville—Southern Appalachian coal operators at a recent meeting here discussed exportation facilities, the preparations made for shipments via Charleston, S. C., etc. It was reported at the meeting that a South American country had sent an agent to the United States some time ago to buy 1,000,000 tons of coal but that he was unable to get it. Restricted traffic facilities, it is stated, shut the Appalachian operators out of this business.

KENTUCKY

Barbourville—Ground has already been broken for the Cumberland & Manchester R.R., the 24-mile line to be extended from Barbourville to Manchester, Clay County. The new line, when completed, will open up one of the most extensive, undeveloped coal and timber fields in the South.

OHIO

Columbus—A campaign is planned to educate Ohioans to "use Ohio coal.'" The first step will be scientific analyses to show that Ohio coal is superior to competing fuels from other states and will produce more heat units in proportion to the cost per ton. This activity in behalf of Ohio coal is the result of the shutting down of the mines of the Sunday Creek Coal Co., the largest operator in the Hocking district. Officers of this company are practically suspending operations in Ohio and will go to West Virginia, where they have valuable coal properties. They give as their reason that Ohio coal-carrying roads are discriminating in favor of West Virginia coal, and that it is practically impossible to compete, at a profit, with the West Virginia product.

A reorganization of the Ohio Mining Department, a part of the work of the Ohio Industrial Commission has been effected. On July 1, J. W. Davies, chief deputy mine inspector retired because of lack of appropriation to pay his salary. Mr. Davies was chief mine inspector under the Harmon administration and was succeeded by J. M. Roan with the title of chief mine inspector and safety superintendent. Mr. Roan has 12 deputies, who are used as field men.

Bethesda—The Badger Mining Co. has begun work at the mine north of the town. It will confine its work for the present to the Parsons tract recently purchased.

INDIANA

Bicknell—Robinson Bros., of Linton, who are sinking a shaft opening for a coal mine near Edwardsport, have reached the river vein. Later they will work a deep vein north of this mine.

OREGON

Toledo—The newly discovered coal mine here is operating daily with an output of 10 tons. This will be continued the balance of this year, and improvements put in for the next season's run to increase the output.

FOREIGN NEWS

Hillcrest, Alta.—The Hillcrest Collieries, Ltd., has been idle since the 15th of June, on account of British miners refusing to work until Germans and Austrians had been discharged. A conference just held between the operators and miners brought out that the company would permit the British and foes of that nation to work alternate weeks, if they would accept.

Juneau, Alaska—The local land office has received a decision of the commissioner of the general land office in the case of the Alaska Smokeless Coal Co.'s application for a group of claims in the Behring River district comprising some 1000 acres and known as the Feed group. The locators were natives of Norway and Sweden. Applications were rejected because the locators had not done the required development work. It is the hope of this office that all pending claims will be cleared up before the end of the year.

PERSONALS

Maury Robinson, the new manager of the Western sales office of the Davis Colliery Co., has taken up his duties succeeding J. W. Hood.

Morton McTurk, superintendent of the Hazle Mountain Coal Co.'s operations of the Black Ridge, has been promoted to the general managership of the McTurk Coal Co., of Girardville, Penn.

N. T. Roberts, Western sales agent of Williams & Peters, has been appointed a city grade-crossing commissioner of Buffalo, N. Y. The position is an important one and the commission has done much service, with much more to be done.

D. A. Thomas, the Welsh coal mine owner, who will represent the British Government in this country and Canada for the purchase of munitions of war, arrived in New York on the "St. Louis" on Monday, July 5. Mr. Thomas states he is here purely on Government business and will pay no attention to the coal industry.

C. L. Couch has been elected president of the F. P. Weaver Coal Co. of Buffalo and C. W. Moss, vice-president, secretary and treasurer. They are practically the sole owners of the stock, having bought the interest of President F. P. Weaver on his retiring some years ago, because of poor health. He died three months ago.

Frank S. White, president of Alabama Convict Improvement Association, has called a meeting of the state executive committee and county committees for July 13, the date of assembling of the legislature, for the purpose of working destruction to the convict lease system in Alabama, and having the convicts transferred from the coal mines to the highways.

George E. Silvester of Rockwood, Tenn., has been elected president of the Mine Inspectors' Institute of the United States of America. The other officers are as follows: Vice-presidents, Thomas Graham, L. D. Devore, Rees H. Beddow; secretary, J. W. Paul; assistant secretary, R. S. Wheatley; treasurer, R. T. Rhys, and editor-in-chief J. T. Beard.

OBITUARY

George W. Hines, a well-known coal miner and secretary of Local Union No. 786, United Mine Workers of America, died in Wheeling, W. Va., recently, following an illness of several weeks. Mr. Hines was 40 years of age and always took an active part in the affairs of the miners. He is survived by his widow and three children.

H. Sparks Bute, aged 70 years, dropped dead of heart failure in the office of Attorney J. M. Core, while attending a meeting of the Board of Directors of the Fink Creek Coal Co. of West Virginia. C. L. V. Bute and J. P. Bute of Uniontown, Penn., brothers of Mr. Bute, were present at the meeting. Mr. Bute was a bachelor and resided with his brother C. L. V. Bute.

John Zelenka, 35 years of age, Secretary of the Pittsburgh Vein Operators' Association of Ohio, with headquarters in Wheeling, died at his home in Brookside, Ohio, July 3, of diphtheria. His youngest daughter died the preceding day of scarlet fever. Interment was made at Linwood Cemetery. Mr. Zelenka entered the mines of Ohio at the age of 8 years, remaining there until the age of 24, when he was made president of District 5 of Ohio.

PUBLICATIONS RECEIVED

"Report of the Mine Rescue Station Commission of Illinois for 1915." Cloth bound volume of 41 pp., 6x9 in., illustrated.

Department of the Interior, U. S. Geological Survey. "Potash Salts, 1914," by W. P. Phalen. Thirty-two pages, 6x9 in.; illustrated.

Department of the Interior, U. S. Geological Survey. "The Production of Fuller's Earth in 1914," by Jefferson Middleton. Six pages, 6x9 in.; unillustrated.

Washington Geological Survey, Bulletin No. 10. "The Coalfields of Pierce County," by Joseph Daniels. Cloth bound volume of 149 pp., 6x9 in., illustrated.

U. S. Department of Agriculture, Bureau of Soils. "Soil Survey of Logan & Mingo Counties, W. Va.," by W. J. Latimer. Thirty pages, 6x9 in., with large map.

University of Illinois, Engineering Experiment Station, Bulletin No. 78. "A Study of Boiler Losses," by A. P. Kratz. Seventy-two pages, 6x9 in.; illustrated.

Department of the Interior, U. S. Geological Survey. "The Production of Lead in the United States in 1914,' by C. E. Siebenthal. Leaflet of 8 pp., 7½x10½ in., unillustrated.

The Industrial Commission of Ohio. Department of Investigation and Statistics, Report No. 3. "Statistics of Mines and Quarries in Ohio, 1913." Ninety-five pp., 6x9 in., illustrated.

Department of the Interior, U. S. Geological Survey. "Advance Statement of the Production of Copper in the United States in 1914," by P. S. Butler. Four pp., 6x9 in., unillustrated.

State of Washington, "Report of the State Inspector of Coal Mines, Biennial Period Ending Dec. 31, 1914," by James Bagley, inspector, Seattle. One hundred and seventeen pp., 6x9 in., illustrated.

Illinois Coal Mining Investigations Coöperative agreement. Bulletin 11. "Coal Resources of district No. 7. Coal No. 6, West of Duquoin Anticline," by Fred H. Kay. Two hundred and thirty-three pp., 6x9 in., illustrated.

University of Illinois. Bulletin No. 77 of the Engineering Experiment Station. "The Effect of Boron Upon the Magnetic and Other Properties of Electrolytic Iron Melted in Vacuo." by Trygve D. Yensen. Nineteen pp., 6x9 in., illustrated.

TRADE CATALOGS

The Spray Mfg. Co., Boston, Mass. "Cooling Water." Seven pages, 6x9 in., illustrated.

The Young Men's Christian Association. "Among the Coal Miners." Eighteen pages, 6x9 in., illustrated.

Beaudry & Co., 141 Milk St., Boston, Mass. "Beaudry Hammers, Motor Driven." Seven pages, 3½x6 in., illustrated.

The Morrow Manufacturing Co., Wellston, Ohio. "Rescreened Chunks." Thirty-two pages, 5½x8 in., illustrated.

Sullivan Machinery Co., Chicago, Ill., Bulletin No. 71-A. "Air Lift Pumping." Thirty-two pages, 6x9 in., illustrated.

Cresson-Morris Co., Philadelphia, Penn. Form No. 1001. Barometric Condensers." Twenty-eight pages, 9x12 in., illustrated.

The Marion Steam Shovel Co., Marion, Ohio. Catalog No. 93. "Marion Reliability and Your Profits." Illustrated, 48 pp., 5½x8 in.

The Scranton Pump Co., Scranton, Penn., Bulletin 102, "Scranton Duplex Plunger Pumps." Twelve pages, 6x9 in., illustrated.

Bohannan-Dugger Easer Joint Co., Inc., Ensley, Ala. "The Engineer's Version of Easer Joints." Sixteen pages, 4x9 in., illustrated.

The Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y. "Central Energy Telephone." Thirty pages, 8x10 in., illustrated.

The Link Belt Co., Philadelphia, Chicago, Indianapolis. "The Circular Storage System." Leaflet of four pages, 6x9 in., illustrated.

R. D. Nuttall Co., Pittsburgh, Penn. Catalog No. 12. "Mine and Industrial Gears, Pinions, Trolleys." Sixty-two pages, 7x9 in., illustrated.

The Atlas Car & Mfg. Co., Cleveland, Ohio. Bulletin No. 1175. "Storage Battery Locomotives, Cranes and Cars." Illustrated, 32 pp., 6x9 inches.

Gifford-Wood Co., Hudson, N. Y. Bulletin No. 17. 'Pivoted Bucket Carrier for Elevating and Conveying Coal, Coke, etc. Sixteen pages, 6x9 in., illustrated.

The General Electric Co., Schenectady, N. Y. Bulletin 14,013. "Direct Current Commutating Pole Motors, Type R C." Fifteen pages, 8x10 in., illustrated.

The Sullivan Machinery Co., Chicago, Ill., Bulletin No. 65-C. "Sullivan Diamond Core Drill, prices, estimates, equipment." Thirty-six pages, 6x9 in., illustrated.

The Weston Electrical Instrument Co., Newark, N. J. "Lectures on Electrical Apparatus and Experiments." One hundred and three pages, 6x9 in., illustrated.

Cement-Gun Co., Inc., 30 Church St., New York. Bulletin No. 101. "Cement-Gun Process of Permanently Repairing Coke Ovens, Etc." Four pages, 6x9 in., illustrated.

The General Electric Co., Schenectady, N. Y. Bulletin 48,303. "Hand-Operated Starting Rheostats and Panels for Direct-Current Motors." Fourteen pages, 8x10½ in., illustrated.

The American Mine Door Co., Canton, Ohio, "Mine Ventilation with Canton Automatic Trap Doors and Signals." Fifty-six pages, 6x9 in., illustrating and describing the Canton automatic mine door and its application.

National Tube Co., Frick Building, Pittsburgh, Penn. Catalog J. "National Pipe for Steam, Gas, Water, Air, Kewanee Unions and Specialties, Iron and Brass Fittings, Valves, Etc." Three hundred and ninety-four pages, 5x7½ in., illustrated.

INDUSTRIAL NEWS

Moundsville, W. Va.—The headquarters of the Mound City Coal Co. have been removed from Pittsburgh to Moundsville.

New York, N. Y.—The Waterbury Co., manufacturers of manila, sisal and wire rope, has removed its general offices from 80 South St., New York City, to 63 Park Row.

Waukegan, Ill.—Extensive repairs and improvements are now being made at the Reiss coal docks which when completed will probably make this plant one of the largest on Lake Michigan.

Philadelphia, Penn.—The U. S. District Court in an opinion handed down July 3, denied the application of the Government to dissolve the alleged anthracite coal trust and decided the case in favor of the defendants.

Harrisburg, Penn.—According to figures issued by the Bureau of Mines the counties of Carbon, Lackawanna, Luzerne, Northumberland and Schuylkill in Pennsylvania mine the bulk of the world's anthracite—96 per cent.

Chicago, Ill.—Proposed increases in rates on coal over roads operating from the Illinois mines to Chicago and points in Wisconsin and North Dakota, were recently suspended by the Interstate Commerce Commission until Dec. 29 next.

Philadelphia, Penn.—During the past month the collieries of the Lehigh Valley Coal Co. were in operation 18 days, which is seven days less than the same period of 1914. The collieries will also be closed down during the first week of July.

Bellaire, Ohio—Announcement was recently made that the officers of the Pittsburgh-Belmont Coal Co., which has been located in Columbus, have been removed to the Dickens Bldg., in Bellaire. The company owns two mines at Neff, and one at Lafferty.

Johnstown, Penn.—The Greenwich Coal & Coke Co. has transferred 161 acres of coal in Greene Township, Indiana County, to the Manor Real Estate & Trust Co., the land holding concern of the Pennsylvania R.R. The consideration is placed at $12,575.73.

Ethel, W. Va.—The George's Creek Coal Co. has given the Roberts & Schaefer Co. of Chicago an order for the mechanical equipment for a 4-track, frame-constructed, "Marcus" patent coal tipple, using "Rands" shaker loading boom, for installation at Ethel, W. Va.

Charleston, W. Va.—The Campbell's Creek R.R. Co. has filed a petition with the Public Service Commission asking for permission to file a tariff on coal shipments from Perryville and Putney to Dana for shipment by river, the tariff to show an increase of 2½c. per ton.

Washington, D. C.—Schedules of the Union Pacific R.R., proposing increased rates on coal in car loads from certain mines in Wyoming and Colorado to interstate points on the Union Pacific, were recently suspended by the Interstate Commerce Commission until Oct. 28 next.

St. Clairsville, Ohio—Oliver Monace and others have organized a coal company and are opening a mine on the Wheeling & Lake Erie R.R. Work on the tipple will be started shortly, while coal will be loaded from a temporary dump in a few days. The side track to the mine has already been laid.

Mauch Chunk, Penn.—As an indication of improved business conditions in the mining region it is interesting to note that a Mauch Chunk foundry and machine company has declined a $3,000,000 order for war munitions, stating that its plant is busily engaged in the manufacture of colliery machinery.

Harlan, Ky.—Several thousand acres of the best coal land in Harlan County will be opened for immediate development when work of grading the new railroad extension from the terminal of the Waisoto & Black Mountain R.R., at Ages, to the mouth of Yocum's Creek is completed. Contractors have started the work.

St. Benedict, Penn.—The Roberts & Schaefer Co., Chicago, has been awarded a contract by the Cherry Tree Coal Co., which is owned by Peale, Peacock & Kerr, for the building of a new "Marcus" patent coal tipple, complete with screening and picking facilities, for installation at Mine No. 15, St. Benedict, Penn.

Mullins, W. Va.—I. W. Clark, a contractor of Graham, W. Va., was recently awarded a contract for the erection of a considerable number of miner's dwellings at the operation of the Devils Fork Coal Co. This firm is opening up its operation, and the new houses must be completed at an early date. The work is to start at once.

Harrisburg, Penn.—Complaint was recently filed with the Public Service Commission by W. P. Boland, of Scranton, against the rates of the Delaware, Lackawanna & Western R.R. Co., charging discrimination. It is alleged that the railroad has interfered with the successful operation of a plant in which the complainant is interested.

Washington, D. C.—The output of bituminous coal in the United States for the first six months of 1915 is estimated by the U. S. Geological Survey to be between 180,000,000 and 190,000,000 tons, the rate of production having been from 85 to 90 per cent. of that averaged during the previous year. Production is now, however, on the increase, having reached its low ebb in March.

Wheeling, W. Va.—The Edgewood Coal Co. recently sold a block of about 800 acres situated three miles east of Wheeling to Pennsylvania and Ohio people. The price is reported to have been in the neighborhood of $75,000. There is a mine in operation on this tract, and it is said that the new owners will operate it on a much larger scale than it has been worked heretofore.

Huntington, W. Va.—Unofficial figures for June show the largest coal tonnage over the Grand Central division of the Chesapeake & Ohio R.R. during a single month in the road's entire history. Approximately 2,100,000 tons of coal were loaded during June, which exceeds the June figures of last year by 60,090 tons. The present coal traffic of the railroad is approximately 80,000 tons per day.

Birmingham, Ala.—It is probable that one of the Sloss-Sheffield Steel & Iron Co.'s furnaces at North Birmingham will go into blast within the next week or 10 days. This will make four furnaces going into blast in the Birmingham district in the near future. Considerable improvement in business conditions in the immediate territory composing the Birmingham district is evidenced by these signs of returning industrial activity.

Tuscaloosa, Ala.—The Pratt Consolidated Coal Co.'s steamer "N. Carney," with two barges of coal in tow, the first to come from above Lock 17, on the Warrior River, recently passed Tuscaloosa, bound for Mobile. The barges were built at the Pratt company ship yards at Holt, and were loaded with 1000 tons of coal each. The company will make a careful estimate of the cost of handling coal by barge which will largely govern its plans for future shipments.

Lexington, Ky.—H. L. Burch, manager of the traffic department of the Lexington Board of Commerce, recently went to Louisville to confer with D. M. Goodwyn, general freight agent of the Louisville & Nashville R.R., over the matter of freight rates. On account of their advantage as river points both Louisville and Cincinnati have better freight rates on coal than Lexington, though in many cases the coal is actually hauled through Lexington to those places.

Covington, Ky.—Holders of mortgage notes of the Phoenix Jellico Coal Co., of Laurel County, Ky., have brought suit in the United States district court at Covington, Ky., for the appointment of a receiver for the company. A total indebtedness on the notes amounting to $46,000 is alleged and it is also asserted, as a ground for the receivership, that the company is insolvent, and that its business has been neglected, rendering the security of the noteholders inadequate.

Whitesburg, Ky.—The Baltimore & Ohio R.R. is entering the eastern Kentucky coal field for its supply of coal as orders aggregating 150,000 tons have been placed with Harlan County operators. It is expected that the Elkhorn Coal Co. at Kona, Ky., in the Boone's Fork field will also close contracts with the B. & O. shortly for a 25,000 ton order for the next few months. In the past the B. & O. has been getting a large part of its supply from the West Virginia field.

Birmingham, Ala.—Since the opening of Lock 17 on the Warrior River, and the inauguration of barge traffic in coal from this district to the Gulf, there has arisen a complaint that an overcharge of pilotage has been made. An investigation was made and an agreement has been effected whereby the Pilots Association has reduced the pilotage on coal one half. Senator H. T. Hartwell of the Finance and Taxation Committee of the legislature, says the legislature will pass a bill removing all reasonable objection to the present system of pilotage at Mobile.

Philadelphia, Penn.—During May of the present year the Philadelphia & Reading Ry. carried 1,349,796 tons of bituminous coal as compared with 1,101,288 tons in May, 1914. The Reading, without a bituminous mine on its entire system, carries a greater tonnage of this coal than it does of anthracite, in which latter kind of fuel it is the leader. Of course the carriage of bituminous is not nearly so profitable because of the fact that the railway company must share the freight with the originating lines and thus anthracite continues to furnish the chief source of traffic revenue.

Lewis, Wash.—The Davis anthracite coal mines case, which has been pending 18 years, has just been settled in favor of two nephews, H. K. Davis of Lewis and S. A. Davis of Chehalis, Wash. Patents will soon be issued for them. The claims were taken up some 20 years ago, but rangers at that time reported them more valuable for timber than for coal. Meanwhile, it is said, New Yorkers jumped the claims. Since that time, they have been tied up in litigation. The coal tests 86 per cent. carbon and on the claims there are said to be seven veins making a total of 52 ft. of solid coal.

South Bethlehem, Penn.—The Lehigh Coke Co. has awarded a contract for the erection of a $300,000 benzol plant to the Carl Still Co., a German concern. The byproducts which are used extensively in the manufacture of high explosives, reliable sources state will be stored for the present. The Lehigh Coke plant is producing 2000 to 2500 tons of coke per day, 212 ovens being in operation. The output will be increased about 50 per cent., as the 150 additional ovens will be placed in operation shortly. H. Koppers & Co., Chicago, have begun work on erection of 212 new ovens, to be completed by April, 1916.

Bellaire, Ohio—The Sunday Creek Coal Co., the largest operator in the Hocking valley, is closing its mines and stores in the Hocking valley, since it is impossible to mine coal in Ohio and to sell the coal at a profit warranting operation. The company will continue operations in its West Virginia properties and await improvement of fundamental conditions in Ohio. Factors against successful working in Ohio are asserted to be the Green coal screen law; preferential rates accruing advantage to West Virginia as against Ohio producers; and the cost of mining, which in West Virginia is far below the cost in Ohio.

Pittsburgh, Penn.—The Standard Underground Cable Co. has been awarded a gold medal, or highest award in its class, by the International Jury of Award, Panama-Pacific International Exposition for its exhibit of a complete line of electric wires, cables and cable accessories. This is the seventh award of this degree which has been received by this company in as many different expositions, and as its products have never been in similar competition oftener, this constitutes a perfect score. The exhibit consisted of samples of bars and insulated wire and cables of different kinds. Cable terminals, junction boxes and other cable accessories are also shown in considerable variety adapted to various classes of service.

Philadelphia, Penn.—Mayor Blankenburg has made the statement that his administration has saved the city during the past year $5,000,000, due to the business-like methods instituted in every department. He particularly cites a saving of over $100,000 in the amount of coal used by the various bureaus during the past year, stating that the tonnage has been continuously decreasing since the beginning of his administration, despite the fact that the city has grown and the population increased. As proof of his assertion tonnage figures for the past three years are given as follows: 1912, 270,339; 1913, 256,089; 1914, 223,316 tons. Estimating the consumption for 1915 to be the same as 1914 there has been a reduction in the purchases since 1911 of 144,648 tons.

Philadelphia, Penn.—The Supreme Court on July 2 heard the argument in the suit brought by the St. Clair Coal Co. and the Alden Coal Co. to test the validity of the 1913 coal-tax act. The case had reached the court on an appeal from the decision of the Dauphin County Court declaring the act valid. The argument offered was practically similar to that before the lower court in that the act was special and local legislation and also in violation of the constitution because it bore on more than one subject—the levying of a tax and then the distribution to the various municipalities and townships in the producing counties. Following the usual custom of the Supreme Court the case has been held under advisement and it is not likely that it will render an opinion for some little time.

New York, N. Y.—The Delaware, Lackawanna & Western Coal Co. is taking steps to comply with a recent ruling of the U. S. Supreme Court requiring that the business of the coal company and of the Lackawanna R.R. be entirely disassociated. E. E. Loomis has resigned the presidency of the coal company, while W. H. Truesdale, vice-president, and Geo. E. Baker, Jr., director, have also resigned their positions. The fact that these officers and directors of the coal company were officers and directors of the railroad were commented upon in the court ruling as an indication of the connections between the companies. The board has authorized the officers of the company to execute a new contract, which shall conform to all matters questioned by the Supreme Court as either illegal or objectionable.

Coal Trade Reviews

General Review

Retailers have full stocks of anthracite and the dullest period of the year is now at hand. Bituminous exports again break all previous records, but domestic market continues under heavy pressure. Middle Western circulars advanced.

The dullest month of the year in anthracite is now at hand. Some operators report the situation as no slower than usual but retailers have apparently accumulated as much coal as they propose to. Prices continue at a low level and some of the individuals are finding the going hard because of their lack of storage facilities. Mine operations continue heavily restricted, and the production for last month showed a decline of more than 800,000 as compared with the same period of last year.

Bituminous is quieter if anything, although there is still a general note of optimism throughout the trade, and the agencies are confident that the next price revision will be upward. Curtailed industrial operations over the holidays tended to reduce the surpluses, and this has been further accentuated by the general tendency among consumers to draw on their reserve supplies. This, together with another uniform smashing of previous export records, are the chief factors of a constructive nature in the market. The June movement over the Hampton Roads piers exceeded the previous high mark by more than 100,000 tons and the gross foreign movement from Atlantic coast ports for the month will be approximately a quarter of a million tons more than any previous record. Otherwise the situation is discouraging; stocks are large so that delays in transportation occasion no anxiety, and the trade is thoroughly in the grip of the customary midsummer dullness.

In spite of the stir in coke and steel circles, agencies in the Pittsburgh district are competing keenly for any business that appears, and even more attractive quotations are being developed on contracts to Apr. 1; competition has been especially severe for a large railroad contract now being negotiated. Some demurrage coal is noted, and there will very probably be more. Export business is helping the situation very slightly, but it cannot attain sufficient proportions to affect the general situation in the Pittsburgh district.

The drastic action of the Sunday Creek Co. in abruptly ordering a complete cessation of operations at all its Hocking Valley mines, has had a bad sentimental effect on the Ohio trade. There is some stocking, but dealers appear confident of being able to get shipments as required and competition is very strong for what business develops. Some distress coal has recently been forced on the market at ruinous prices which has made the consumers even more confident that they will be able to continue buying at low prices indefinitely.

The July 1 advance in the Middle Western circular occasioned a slight month-end spurt and created a better feeling in the trade. There has been a general advance all along the line and shippers are showing a disposition to hold the circular as the minimum, which is in welcome contrast to the demoralized conditions that have prevailed for the past several weeks. Outlying districts appear to be taking very little coal, and a heavy buying movement is anticipated in this direction later. The continued encroachment of the Eastern coals into the Middle Western district is causing much concern.

A Year Ago—Curtailed mining in the anthracite regions and the market continues under heavy pressure. Eastern bituminous situation dull but gradually improving toward the West. Lake movement unsatisfactory. Agreement reached in the Ohio wage scale.

BUSINESS OPINIONS

Iron Age—Developments of the week show a further improvement in steel trade conditions and prospects. Increasing production, accompanied by increasing demand, indicates that the summer months will show no letdown. They may even be marked by activity on a larger scale. The June contract period ended with a very considerable volume of business taken at prices from $1 to $3 below those now asked, and specifications came in freely at the last. Pittsburgh reports that June business in many cases exceeded that of any month in a year, while in the Chicago district, where the improvement in the spring months by no means kept pace with that at Pittsburgh, June bookings were nearly double those of May.

Boston News Bureau—It is difficult to imagine a more favorable position for the long pull than the fact that we are selling products abroad at our own prices and buying foreign holdings of American securities at our own prices. We hold the upper hand coming and going. We are also steadily increasing our gold supply either in the actual metal or gold contracts. As trade follows the flag, so confidence follows gold. At the moment, Great Britain is liquidating American securities of the best character in order to subscribe to the new British war loans. Sterling exchange shows the effects of this selling, although some of the strength may be attributed to the negotiations to place a British loan in New York of $100,000,000 or more.

Dun—Prospects at the opening of the second half of the year afford a striking contrast to those of six months ago. Then, new problems were presented that made the outlook extremely uncertain, whereas business has since become more fully adjusted to the unusual conditions created by the war, and the future is now viewed with equanimity rather than concern. The record of the first half of 1915 is largely one of difficulties encountered and obstacles surmounted, and the fundamental soundness of the economic structure is demonstrated by the steady recuperation from effects of the previous strain.

Marshall Field & Co.—Current wholesale shipments of dry goods have been heavier than during the corresponding week a year ago, and collections are good. A larger number of buyers were in the market than for the same period last year.

Bradstreet's—Further improvement, notwithstanding vagaries of the weather and slow movements at some points, is the outstanding feature of this week's reports. Where the weather has been favorable, seasonable goods have moved from the counters of retail dealers in larger volume, and though clearance sales have been a stimulus to this line, faith in the future is marked. Crops, collectively considered, are promising, some of them more so than ever before. War orders are of enormous proportions; brass mills in New England, sold far ahead, are intensely active.

ATLANTIC SEABOARD

BOSTON

Concessions still offered f.o.b. and delivered prices low. Georges Creek again in short supply coastwise. Market for Pennsylvania grades continues to improve slightly. Anthracite shippers fairly well supplied with orders.

Bituminous—The Pocahontas and New River situation shows no change from a week ago. Some of the factors still have coal they are pressed to sell and that accounts for the unevenness in prices. Other shippers have a sufficient amount of business in hand, both coastwise and off-shore, and they talk of better conditions in a month or so. No buying, however, has developed of any consequence. Stocks are large and even contract demand has sagged off. A week ago there was only one coal boat discharging at the largest railroad terminal here. Prices for delivery inland remain at the low level established by "market cargoes" earlier although the concerns who have re-handling facilities of their own are now making the prices. The demand here is unlikely to improve before September at the earliest.

Cargoes are being despatched in record time at all the Hampton Roads piers and there is certainly no shortage of coal. The movement coastwise has been retarded by weather but such is the state of trade that a week's delay would be hardly noticeable. The only possible chance of upset is a strike next spring.

Georges Creek is again in short supply at Philadelphia and at New York. A fortnight's notice is required in some cases and tonnage at Baltimore is loading rather slowly. It is likely that Georges Creek transportation for New England will soon be loading again at Hampton Roads in order to keep contractors supplied.

The better grades from Pennsylvania continue to show slight improvement. One of the disadvantages faced by new coals in this territory is that the operators are required to give extended options pending trial of the coal. It is the sign of the times just now that several of these options are being withdrawn. Certain of the Cambrias and Somersets that are available for export are participating in a fair share of the off-shore business—more than was expected.

Current quotations on bituminous at wholesale are about as follows:

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines*	$0.85@1.40	$1.20@1.60	$1.67@1.77	
Philadelphia*	2.10@2.65	2.45@2.85	2.92@3.02	
New York*	2.40@2.95	2.75@3.15	3.22@3.32	
Baltimore*	....	....	2.85@2.95	
Hampton Roads*	....	....	....	$2.65@2.80
Boston†	....	....	....	3.60@3.78
Providence†	....	....	....	3.50@3.73

* F.o.b. †On cars.

Water Freights remain as last quoted. There is no particular demand for tonnage and on the other hand there is no great amount of it seeking charters.

Anthracite—While there is no activity in domestic sizes, there is a fair amount of buying, and the shipping companies are not filling orders very promptly. Retail prices were advanced in Boston 25c. on all sizes, effective July 1. The new schedule is:

Broken	$6.75	Pea	$5.75
Egg	7.50	Shamokin	7.75
Stove	7.50	Franklin	8.75
Nut	7.75		

NEW YORK

Practically no spot orders for bituminous coal. Pennsylvania operators report better business. Anthracite a trifle stronger. Operations still curtailed.

Bituminous—The scarcity of spot orders continues in the soft-coal trade. Contract coals appear moving as well, if not better, than for some weeks. As anticipated the reports for June show that the export business exceeded all expectations with a still better outlook for this month.

The holiday affected shipments noticeably this week and most of the mines were idle nearly the full week; this had a tendency to strengthen the market in regard to supply, but not in prices. Demand from New England is gaining strength. Pennsylvania operators report increased orders for the better grades. Manufacturers are drawing on their reserve supplies and the work of replenishing these must soon begin.

Operators are now feeling the effects of the labor shortage. Many Italians and other foreigners have left the mining regions for their native lands while others are seeking employment in regions where work is steadier.

Some shippers report practically no spot business and none in prospect until fall. Inquiries for export coals continue to be received. Unofficial reports indicate that the exports from the Atlantic seaports for June were 256,695 tons more than those of May.

Current quotations are on the following basis:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.30@3.40	$3.30@3.40	$3.30@3.40	$1.75@1.85
Georges Creek Tyson	3.00@3.10	3.00@3.10	3.00@3.10	1.45@1.55
Clearfield:				
Medium	2.65@2.80	2.55@2.65	....	1.10@1.25
Ordinary	2.55@2.60	2.55@2.60	....	1.00@1.10
Broad Top Mountain				1.10@1.45
Cambria County:				
South Forks	2.90@3.05	....	....	1.35@1.50
Nanty Glo	2.75@2.80	....	....	1.20@1.25
Barnesboro	2.65@2.70	....	....	1.10@1.15
Somerset County:				
Quemahoning	....	2.70@2.85	2.70@2.85	1.20@1.30
Medium	2.65@2.70	2.60@2.65	2.60@2.65	1.10@1.15
Latrobe	2.45@2.55	....	....	.90@1.00
Greensburg	2.75@2.80	....	....	1.10@1.15
Westmoreland	2.95@3.20	....	....	1.15@1.40
West Virginia Fairmont ¾		2.60@2.70	2.60@2.70	.80@ .90
Fairmont mine-run		2.50@2.60	2.50@2.60	.70@ .80
Steam		2.45@2.50	2.45@2.50	.90@ .95
Western Maryland		2.35@2.40	2.35@2.40	.80@ .85

Anthracite—While there has been no increased demand for anthracite there is not so much at the docks and the market is a little stronger. The lack of business and the holiday caused some of the companies to close down for a week, while most of the others suspended operations for three or four days. This had a beneficial effect on the situation.

Production for June is believed to have been at least 400,000 tons less than the same month last year when the shipments were 6,130,186 tons. It is believed that the total movement for the first half of the current year will fall nearly a million tons short of that for the corresponding period of 1914.

Some wholesale dealers report a better call and are looking forward to an early fall business. The demand from the West has picked up some. Locally the situation is weak. Tidewater coal is moving slowly though the demand along the line is a trifle better.

Individual coals are the longest, with chestnut leading; some cargoes of this size are said to have been sold at about the April circular while stove and egg have been quoted at from 10 to 20c. off. The suspension of mining had a good effect on the steam-size situation. The supply on hand has been greatly reduced and the situation has eased up notably. There is a tendency toward better prices. Pea coal continues off with some of the cheaper grades quoted at very low prices.

Current quotations are as follows:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$4.85		$4.90	
Egg	5.10	$4.80	5.15	$4.85
Stove	5.10	4.80	5.15	4.85
Chestnut	5.35	5.00	5.40	5.05
Pea	3.35@3.50	2.70@2.95	3.40@3.55	2.75@3.00
Buckwheat	2.50@2.75	2.05@2.30	2.55@2.80	2.10@2.35
Rice	2.00@2.25	1.70@1.85	2.05@2.30	1.75@1.90
Barley	1.75@2.00	1.45@1.70	1.80@2.05	1.50@1.75

PHILADELPHIA

Summer dullness pervades the anthracite market, with prices low. Individual operators troubled with car demurrage. Pea still low but with production fairly well taken care of. Bituminous very quiet, with good tide shipments to foreign ports.

Anthracite—The market is now in the first of the two worst months of the year, but conditions are probably not as bad as expected. As a matter of fact some shippers say they are doing even better than last year, considered from the standpoint of tonnage. It is practically an idle season for the retail dealers, as they have taken into storage about as much coal as they intend to and this leaves them with plenty of time and opportunity to place their yards in condition for the expected good fall trade.

Prices still continue low, but there are those who profess to believe that the lowest point has been touched. If there is any particular size in demand it is stove; a large sale of a good quality of this size has been reported at the circular price. On the other hand quite a quantity of chestnut has been sold at from 20c. to 30c. off circular. Several dealers report that during the past week they have been offered all the domestic sizes at the April circular.

Pea coal, of course, continues to be offered at low figures, but no one seems to be actively pushing this size, and it is not likely that any lower prices will be made. If anything, pea has slightly stiffened owing to the large orders placed for delivery over the summer and the restricted working time at the collieries. The smaller sizes are not in active demand, although some of the companies are a little hard pressed to supply the special steam grades. Short working time has affected the production of sufficient broken coal to meet the demand on contract orders.

The dull market has made it expensive for the individual operators to keep their collieries working on short time, as some of them must do to fill contracts. Having no place to store the slower sizes, demurrage has mounted up. It is known that one firm was compelled to release an entire trainload of coal this week at April prices less the 2½% tax on this account.

Collections are still very slow.

The circular prices to which the 2½% state tax must be added, are as follows:

	City	Tide		City	Tide
Broken	$3.20	$4.45	Pea	$2.50	$3.25
Egg	3.45	4.70	Buckwheat	1.25	2.25
Stove	3.70	4.70	Rice	.85	1.75
Chestnut	3.85	4.95	Barley	.50	1.50

Bituminous—If anything, the market is even a little more quiet. The closing down of the large cement plants in eastern Pennsylvania on account of the holidays has thrown quite a tonnage of slack on the market, which will cause some annoyance until it is moved. Prices are practically without change and considered to be about as low as they can possibly get, the feeling being that the only revision possible is upward. Tide shipments are holding up well, with fairly good inquiries from foreign sources.

The following prices are the general market on the various grades:

Georges Creek Big Vein	$1.65@1.75	Fairmont gas, mine-run	$1.15@1.25
South Fork Miller Vein	1.50@1.60	Fairmont gas, slack	.65@ .75
Clearfield (ordinary)	1.00@1.20	Fairmont lump, ordinary	.85@ .95
Somerset (ordinary)	1.00@1.15	Fairmont mine-run	.75@ .80
West Va. Freeport	.85@ .95	Fairmont slack	.45@ .55

Philadelphia ocean charters have been reported as follows:

Vessel	Nationality	To	Tons	Terms
Ardgarroch	British	Marseilles	3100	
Veneiro	Italian	W. Coast Italy	3308	
Millie R. Bohannon		Wilmington, N. C.		1.10
Henry S. Little		Summerside, P.E.I.		2.25
Bayard Barnes		Bahia	1400	7.75
***Veneiro**	Italy	Savona	3308	
***Oreland**	British	Rio Janeiro	2709	
Samuel W. Hathaway		Guaynilla	906	
*Egda	Nor.	Cuba	1610	
*Saint Andre	French	St. Nazaire	3681	
*Starfond	Norwegian	Havana	2256	
Geo. D. Edmonds		Summerside, P.E.I.	2256	

Steamers are indicated by **bold face** type. * Steamships.

HAMPTON ROADS

Export and coastwise movement heavy. All previous records broken during month of June. Total movement 1,437,319 tons.

Dumpings during the past week have been heavy. The largest amount of the exports has been taken by Italy. The largest single cargo of the week was loaded into the Panama collier "Achilles" which took 12,000 tons of cargo and 1200 tons of bunkers for Cristobal.

In addition to coal movement there has been one large cargo of coke loaded for Valparaiso. Nut and slack and high volatile coal has moved in small quantities to the New England ports but the heaviest cargoes have been either New River or Pocahontas run-of-mine. Export cargoes have practically all been New River or Pocahontas, very little high volatile coals being exported from Hampton Roads at any time.

The demand both for export and coastwise cargoes has been good and some large sales for prompt shipment are understood to have been made. Few of the shippers at this time have any large surplus of coal on the railroad yards and the accumulation at Tidewater appears to be decreasing considerably.

During the month of June the piers at Hampton Roads broke all previous records, the total movement for the three railroads being 1,437,319 tons. Previous to June the record was for 1,307,747 tons which was made during May. Of the total dumpings for June the Norfolk & Western Ry., at Lamberts Point, handled 853,845 tons, the Chesapeake & Ohio at Newport News 350,343 tons and the Virginia Ry. at Sewalls Point 233,131 tons.

Railroad Tonnages—Dumpings over the local piers for the past several weeks compare as follows:

Railroad	Week Ending June 5	June 12	June 19	June 26	July 3
Norfolk & Western....	156,011	197,533	207,824	213,279	211,017
Chesapeake & Ohio....	44,702	89,447	71,511	79,870	83,678
Virginian............	38,372	34,975	51,644	87,840	58,455
	239,085	321,955	330,979	380,989	291,828

The following vessels have cleared from Hampton Roads during the week of June 18 to 25:

Norfolk

Vessel	Destination	Tons
Wascana[1]	Rio de Janeiro	7161
Italia[2]	Torre Annuziata	7000
Panama Transport	Valparaiso	*4959
Ydun[3]	Georgetown, Dem.	1700
Chiswick[1]	Barbadoes	3000
Worrior	Buenos Aires	5205
Clifton	Sierra Leone	5949
Edward B. Winslow	Rio de Janeiro	5011
Rosalia L.	Genoa	9440
Wegadesk	Canal Zone	6500
Circe	Gibraltar	3977
North Dakota	Naples	7106
Malang	Rotterdam	4884
Windsor	Palermo	7850
Blanca	Pernambuco	2299

Norfolk

Vessel	Destination	Tons
Achilles	Canal Zone	12000
Blanch H. King	Las Palmas	1547
Doonholm	Spezia	7026
Alban	Para (Part Cargo)	650

Newport News

Vessel	Destination	Tons
Palmanter	Buenos Aires	5100
Berwindvale	Maddalena	7100
Tancred	St. Lucia	5500
Stormount	Havana	2800
Angelisea	Puerto Mutitar	6500
Woodleigh	Zarate	3200
Antares	Port Au Spain	2800
Sicania	Italy	4700

[1] Smokeless Fuel Co. [2] Pocahontas Fuel Co. [3] Castner, Curran & Bullitt. * Coke.

BALTIMORE

Prices fairly well maintained despite light demand. Contracting period practically over. Export business remarkable and port record here is broken.

There is little or no new business. The contracting season is practically at a close and the coal men are urging coal forward on contract obligations. Despite the light demand prices were fairly well maintained. Specialized coals like Georges Creek or South Fork sell at good figures, the former bringing from $1.35 to $1.75 for top grade, and the latter around $1.40. Pennsylvania line coals as a whole are bringing from 90 and 95c., for low grades, to $1.15 and $1.20 for good standard coals. B. & O. coals, like low-grade West Virginia and Western Maryland steam fuels are offering at 75 and 80c., with medium to best grades bringing $1.10 to $1.25. Fairmont gas three-quarter sells around 85c., and slack is weak at 50c.

A remarkable export business is being done out of this port. June broke all records for shipment on foreign account. A total of 305,917 tons was dumped into vessels for foreign delivery. Italy took the largest amount, 127,744 tons, and Argentina was next with 98,516 tons. While July is not expected to equal this record, the movement will undoubtedly be heavy.

The following steamers were announced chartered for the export loading from this port:

Vessel	Nationality	Destination	Rate
Styliani Bebis	Greek	West Coast of Italy.	$10.08
Kanaris	Greek	West Coast of Italy	9.88
Ulida	British	Alexandria, Egypt	10.80
Quenmore	British	Barcelona	8.88
Lewis H. Goward	American	Porto Rico	
Urd	Norwegian	Stockholm	

OCEAN CHARTERS

Coal charters have been reported by the "Journal of Commerce", as follows:

Vessel	Nationality	From	To	Tons	Rate
Maasdik	Dutch	Baltimore	Buenos Ayres[3]	2935	$8.28
Dorington Court	British	Virginia	Italy[2]	3019	9.84
Eleni Stathatos	Greek	Virginia	Italy[2]	1871	9.12
Petritsis	Greek	Virginia	Italy[2]	2352	9.60
		Philadelphia	Barcelona	7200	8.88
Urd	Norwegian	Baltimore	Stockholm	1968	
Campeiro	Brazilian	Baltimore[1]	Italy[2] [5]	1605	10.80
St. Andre	French	Philadelphia	St. Nazaire	3681	
	Italian	Atlantic Range	Italy[2]	5500	9.60
Storfond	Norwegian	Philadelphia	Havana	2256	
Stormount	British	Newport News	Havana	1231	
Clara Davis		Virginia	Brazil port	544	
Wm. E. Litchfield		Norfolk	Puerto Plata	472	3.50
Ardgarroch	British	Philadelphia	Marseilles[4]	3160	
Mariteres	Spanish	Virginia	Casablanca	1943	9.60
Ulidia	British	Baltimore	Alexandria	1988	
Augusta W. Snow		Norfolk	Rio Janeiro	671	
Eleanor F. Bartram		Baltimore	Rio Janeiro	920	
Bayard Barnes		Philadelphia	Bahair	954	7.75

Note—Steamers are indicated by **bold face type**, all others being schooners.
[1] Or Virginia. [2] West Coast. [3] Or La Plata. [4] And Algiers. [5] Or Sicily.

OCEAN FREIGHTS

Freights show little change. Orders for charters to the Plate accumulating.

Freight conditions are practically the same as a week ago. Although a number of steamers were chartered for export coal, the rates have varied but slightly from previous quotations. A steamer was recently chartered from a United States port north of Hatteras to Genoa at $9.36. Plate orders from here are accumulating, which is rather surprising as grain freights from the Plate have considerably improved recently.

The freight market is now quotable as follows:

To	Rate	To	Rate
Havana...............	$2.00@2.25	Bermuda..............	**$3.00**
Cardenas or Sagua......	**2.75**	Vera Cruz.............	3.50@3.75
Cienfuegos............	2.75@3.00	Tampico..............	3.50@3.75
Port au Spain, Trinidad.	3.50@3.75	Rio..................	**8.64**
St. Lucia.............	**3.50**	Santos*..............	**8.88**
St. Thomas............	3.00@3.25	Montevideo...........	**8.34**
Barbados..............	3.50@3.75	Buenos Aires or La Plata	**8.40**
Kingston..............	2.75@3.00	Rosario..............	**8.88**
Curacao...............	**3.50**	West Coast of Italy.....	**9.36**
Santiago..............	2.50@3.00	Barcelona**...........	**8.40**
Guantanamo...........	2.50@3.00	Valparaiso or Callao....	6.75@ 7.00
Demerara.............	**4.25**	Marseilles............	**8.64**

Note—Rates noted in **bold face** type are only approximate.
* Consignees paying dockage dues. **Spanish dues for account.
W. W. Battie & Co.'s Coal Trade Freight Report.

LAKE MARKETS

PITTSBURGH

Market no better, perhaps worse. Contracts to Apr. 1 at substantially prompt prices. Slack easier. Operations 50 to 60%.

If there has been any change in the local coal situation in the past week it has been for the worse. Operators both large and small are keener to secure business and while prices for free coal are not materially lower, more attractive quotations are made on contracts to Apr. 1, prices substantially as low as have lately been quoted for prompt. There have been free sellers of ¾-in. to Apr. 1 at $1.10, while mine-run for the same period has been offered at approximately $1. At the beginning of the season Lake coal was quoted at $1.15 and sales at $1.10 were regarded as representing cut prices, whereas now $1.10 can sometimes be cut.

Slack has softened further and Pan Handle is freely offered at 45c., while Youghiogheny gas slack can be had at 50c. The Baltimore & Ohio coal requirements for the Pittsburgh division are about to be let, for a twelvemonth, and there is a scramble for the business. It is understood that as low as $1 has been bid on the twelvemonth, for mine-run, and in view of the prospective wage adjustment Apr. 1 this is equivalent to a somewhat lower figure for the period to that date.

One or two Connellsville district operators are doing a very fair business in coal for export to Italy, and expect the business to increase, but the Pittsburgh district proper is not able to participate, having higher production cost. The following quotations represent the usual asking prices for free coal, sometimes shaded, and in a measure represent prices that might be done on contract: Slack, 45@50c.; nut and slack, 90@95c.; nut, 95c.@$1; mine-run, $1@1.05; ¾-in., $1.10@1.15; 1¼-in., $1.20@1.25, per net ton at mine, Pittsburgh district. Mines are operating at between 50 and 60% of capacity.

BUFFALO

Minor signs of improvement, mostly in coke. Local business continues dull. Anthracite not improved.

Bituminous—There are outside indications that the demand is improving; the stir in steel and coke has not been felt to any extent by coal, but it must follow some time. There was a general shutting down of all sorts of business over the holiday. Nothing is really active and several city coal jobbers have dropped business entirely for several days and gone off on vacations.

There is some coal on track, paying charges and there is likely to be more; the idea appears to be general that the demand is going to improve and the output is running up, with the surplus mostly unsold, to put the market in bad shape till the actual improvement appears. The bituminous prices continue on a basis of $2.70 for Pittsburgh lump, $2.55 for three-quarter, $2.45 for mine-run and $2.25 for slack. The slack trade is very dull and prices are being cut badly.

Anthracite—The trade is still as dull as ever. All branches are so slack, except the movement to the Lakes, that it is necessary to restrict the mining and this is being done more and more as the season advances, with small prospect of any change for the better right away. As a rule the retail dealers are letting the trade take care of itself. The movement of coal by Lake continues as active as ever, the figures slightly exceeding last year to date. For the week the total is 140,550 tons; for June, 618,236 tons and for the season, 1,420,378 tons, as against 1,409,325 tons to the end of June last season.

TORONTO, CAN.

Industrial conditions show no improvement and trade the dullest for years. Threatened stoppage in manufacture of war materials.

Dealers state that trade has not been so quiet for many years. Industrial conditions show no sign of improvement, except as regards the activity in shell manufacture, and the continuance of this industry is threatened by the recent announcement of the British Government that hereafter no more empty shell cases will be accepted. Manufacturers have not the equipment for loading shells and hesitate about procuring it unless assured of large and steady orders. Many skilled mechanics are leaving for England. Prices for best grades are as follows: Retail anthracite egg, stove and nut, $7.50; grate, $7.25; pea, $6. Bituminous, retail, steam, $5.25; screenings, $4.25 to $4.50; domestic lump, $6; cannel, $8; wholesale f.o.b. cars three-quarter lump, $3.56; screenings, $2.90.

CLEVELAND

Especially low prices quoted at the opening of the week. Very little coal on track and buying at the low point of the last four weeks.

Inventories at almost all of the big manufacturing plants greatly reduced the demand for coal this week; the number closed is the largest since the first of the year inventory. It will be the latter part of next week before the demand for coal again reaches normal. There has been no attempt to cut prices this week because the places in which to put coal are so limited. A buyer can, however, get about any price he wants to pay within the range of the last two weeks.

Lake shipments are at the lowest point since the season got underway. July is usually a light month and the docks this summer are unusually well provided with coal. The Soo canal report for June shows a decrease in Lake Superior shipments as compared with June 1914. Last month 300,631 tons of hard coal was shipped as compared with 414,401 tons a year ago. The soft coal traffic totaled 1,624,535 tons as compared with 1,846,689 tons a year ago.

Prices for shipment are as follows:

	Pocahontas	Youghiogheny	Bergholz	Fairmont	Ohio No. 8
Lump	$3.45	......	......	....	......
Lump, ¾ in	.....	$2.15	$1.90	$1.85@1.90	$1.85@1.90
Egg	3.45	......	......	....	......
Mine run	2.65	2.05@2.10	1.80	1.80	1.75@1.85
Slack	......	1.45	1.45	1.45	1.45

COLUMBUS

No improvement. Steam business slow and Lake trade is not increasing materially. Stocking is showing up better than formerly.

Little or no improvement is noted in the Ohio trade. In fact some of the coal men believe it is growing worse as is shown by the closing of all of the mines of the Sunday Creek Coal Co. on the Hocking Valley side of the field. The tone of the market is not good and competition is getting very strong. There are no hopes for much improvement in the immediate future.

Stocking of domestic coal is going on but the buying is not as vigorous as was expected. Dealers are apparently loath to accumulate stocks under present conditions, relying on their ability to get shipments promptly when the demand is felt. The approach of the threshing season is expected to stimulate some buying. Retail prices are fairly well maintained and dealers are not inclined to cut prices in order to force trade.

Lake trade is likewise rather quiet. Congestion on the docks of the Upper Lake ports is still reported and the movement off the docks to the interior is limited. Some Ohio coal is going to the Northwest but the larger percentage loaded at Toledo is from West Virginia mines. The Hocking Valley docks at Toledo loaded 82,000 tons during the week ending July 2.

The steam business is dull in every locality. Buying is being done on a limited scale as consumers are not inclined to accumulate stocks. Manufacturing is still low, with the exception of war supplies. The demand for the small sizes is still good but a larger production has weakened the market.

Prices in the Ohio fields are:

	Hocking	Pomeroy	Kanawha	Eastern Ohio
Rescreened lump	$1.45	$1.50		
Inch and a quarter	1.35	1.35	$1.30	
Three-quarter inch	1.25	1.30	1.25	$1.20
Nut	1.15	1.25	1.15	....
Mine-run	1.05	1.10	1.05	1.00
Nut, pea and slack	.70	.75	.65	.65
Coarse slack	.60	.70	.55	.55

Mines have been working at about the following percentage of full capacity:

	Week Ended					Week Ended			
District	June 12	June 19	June 26	July 3	District	June 12	June 19	June 26	July 3
Hocking	25	25	25	25	Cambridge	35	30	30	20
Jackson	20	15	20	25	Masillon	40	35	30	15
Pomeroy	50	50	45	30	Eastern O.	30	45	50	40
Crooksville	30	30	25	55					
					Average	33	33	32	30

CINCINNATI

Continued dullness, with much surplus coal, has resulted in frequent heavy price concessions, on both contract and spot coal. No early improvement can be expected.

Some ruinous prices have brought the market in this vicinity very close to demoralization, as far as actual business is concerned. When four-inch lump coal is offered at less than a dollar a ton on a contract, as it was in this vicinity recently, it is apparent that the market is in a bad way. Nut and slack can, of course, be had at much lower figures, especially for spot coal, which has to find buyers at any price.

These factors have only increased the indifference of buyers strengthening their belief that there is no use in tieing themselves up on contract. The technical position of the market is regarded as fundamentally strong, in view of the slenderness of reserve stocks everywhere, but the present market is completely flat and will apparently recover slowly.

LOUISVILLE

Beginning of the stocking movement the only encouraging factor in the situation. Prices varying over a wide range.

Market conditions in Kentucky are showing something of an improvement, with the nearer approach of the end of July, when the retailers' stocking operations begin in earnest. The first part of the month saw a considerable improvement in the number and tone of inquiries and these promised fairly well. Industrial conditions and requirements are showing no particularly extended improvement; whenever a buyer appears he is bombarded from all sides by sales representatives.

Prices show a wide range, eastern Kentucky block varying from $1.25 to $2, according to quality, etc., and all other grades based on these prices. Nut and slack ranges from 25 to 65c. a ton. Pea and slack in Western Kentucky are very scarce, due in a considerable measure to the fact that the Illinois Central is taking straight run-of-mine coal and not screened coal as formerly was the case.

BIRMINGHAM

Both steam and lump coal show improvement. The demand for steam coal, especially, is much larger than for several months, while lump coal shows a very healthy increase. Blacksmith coal is normal.

COKE

CONNELLSVILLE

Independents advance wages to Frick scale prompted by some labor troubles. Market dull and unpromising. Temporary firmness in spot furnace on account of holiday.

The independent operators that made wage reductions last year, largely in the early part of the year, have been forced to return to the Frick scale. The strike of the Washington Coal & Coke Co. operatives week before last, resulting in their being granted the full Frick scale, showed the other operators that they would have to restore the old wages, or lose men if not encounter strikes, and one by one they have announced the restoration, the leading independent, W. J. Rainey, also joining the group. Thus the operators are given higher costs, by perhaps 10c. a ton, while the coke market affords them no better opportunities.

Consumers are showing very little interest in contract coke and the consumptive prospects are not particularly bright. Late last week two furnaces that were using merchant coke blew out, one at Steubenville, a steel works stack, and the merchant furnace at Girard. As a rule it is only the steel works that make their coke that are increasing their furnace operations. Late last week spot furnace coke stiffened 10c. a ton, on account of the approaching holiday and it is possible that later this week enough furnaces will find themselves short of coke to bid up the spot market temporarily. Most shippers, however, have increased their shipments somewhat, and have also accumulated some coke on track. Foundry coke is rather quiet again, and the total quantity contracted for the twelvemonth beginning July 1 is unusually small. The market is quotable at $1.60 for spot furnace, $1.75 for contract furnace to Jan. 1, $2@2.50 for spot foundry and $2.20@2.50 for contract foundry, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended June 26 at 355,478 tons, an increase of 6968 tons, and shipments at 346,377 tons, a decrease of 5399 tons.

Baltimore—Coke is still more or less a drug on the market like the less desirable grades of coal. Connellsville 72 hr. is offered as low as $2.30, with 48-hr. at $1.65. West Virginia 72-hr. sells at about $2 to $2.15, and 48-hr. at from $1.55 to $1.60.

Buffalo—There is considerably more activity in coke than for some time and the output is already increasing. Some members of the trade report an advance in price, while others are positive that none has taken place in this market. An advance must occur soon if the reports of large increase of output continue. Prices are stronger on the basis of $4.25 for best 72-hr. Connellsville foundry and $3.30 for stock coke.

Chicago—Spot sales of coke are less than last week, but contract shipments have been moving in steady volume. Further advances in steel products incline wholesalers here to the view that a better era is at hand. Domestic coke was somewhat slow the past week. Prices are as follows: Byproduct, $4.65@4.85; Connellsville, $4.75@4.90; Wise County, $4.75; gas coke, $3.75@4.90, furnace, $4.65@4.75.

MIDDLE WESTERN

GENERAL REVIEW

Prices for Indiana and Illinois coals narrowing with better buying of domestic sizes reported. Screenings slightly softer. All-rail anthracite shows no better demand.

Some life has been injected into the domestic trade the past week due to increased buying by retailers. An advance in circular prices has occurred on all Western coals, and the present attitude of shippers is to consider these list prices as the minimum. Most mines are still operating on an average of not more than three days per week, except in southern Illinois where there has been better running time.

The anticipated recovery in screenings did not materialize, and they have again declined an average of 5c. per ton on current shipments; it is apparent that this is due to increased production of coarse sizes and the strike of the building trades in Chicago, which has closed down factories, causing decreased consumption of screenings and steam coals. No revival of country buying has transpired so far, mainly due it is said to scarcity of ready cash in the country districts. The purchase of threshing coal this year has been in less volume due to the extended use by farmers of straw burners and gasoline tractors for power. There has been a further increased movement from southern Illinois mines to Northwestern markets. More West Virginia and Kentucky fine coal is under contract for movement into northern Indiana points than ever before. Contracts have been let for Kentucky screenings in northern Indiana and southern Michigan at prices as low as 65c. per ton at the mines.

CHICAGO

Some general price advances on the first of the month. Market still continues dull. Eastern coals gaining strength. Anthracite unusually dull.

Franklin County domestic sizes advanced to $1.50 on the first and shippers are firmly holding for this price. Screenings have declined about 10c. per ton from this field.

It is expected that the Harrisburg and Saline County operators will closely follow the lead of the Franklin County operators in advancing prices. Screenings from these mines have eased off at least 5c. per ton during the week.

Aside from a little increase in domestic sales, the situation at the Indiana mines is devoid of interest. Prices for domestic sizes remain stationary. Contracts are still being made largely at last year's figures, and in some cases less.

Clinton operators advanced domestic prices, and report a slightly better demand for these coals. Steam coals from these mines, however, are weaker.

No change has occurred in the demand for Springfield district coals except that screenings are slightly softer. Domestic lump has been marked up to $1.50, effective July 1.

The smokeless trade is still conspicuously firm, and Western shipments are closely restricted. Pennsylvania smokeless is moving slowly, but the operators are sacrificing no coal in the open market and prices are firm at June circular.

Better inquiries are reported for July delivery of Hocking, and increased strength is noted in all sizes.

Eastern Kentucky coals are still on the bargain counter, and prices quoted are on shipments from the mines, spot sales in many cases being made at considerable less figures.

The dealers did not avail themselves of the low prices prevalent in June for anthracite to the extent anticipated, and while the latter part of the month showed some increased buying, it was not of the normal strength of other years. Notwithstanding the market is unsatisfactory, prices are well maintained with a few minor exceptions. The July outlook is decidedly uncertain. Prices f.o.b. cars Chicago are as follows:

Chestnut	$6.80 to 6.90	Grate	6.30 to 6.40
Egg and stove	6.55 to 6.65	Pea	5.50 to 5.55

Yard prices 25c. higher.

Quotations in the Chicago market are as follows:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump	$1.35@1.50	$1.25@1.35	$1.35@1.50	$1.25@1.35	$1.40
Steam lump	....	1.15@1.25	1.10@1.25	1.15@1.20	1.25@1.30
2½-in. lump	....	....	1.25@1.30	1.25@1.35	1.30
1¼-in. lump	....	....	1.20@1.25	1.15@1.25	....
Egg	1.25@1.50	1.25@1.35	1.15@1.25	1.10@1.25	1.15@1.25
Nut	1.25@1.50	1.15@1.25	1.00@1.10	.95@1.00	1.00@1.05
No. 1 washed	1.35@1.50	....	1.50@1.60	....	....
No. 2 washed	1.25@1.35	....	1.40	....	....
No. 1 nut	1.25@1.50	....	....	....	....
No. 2 nut	1.20@1.35	....	....	....	....
Mine-run	1.05@1.25	1.00@1.05	.85@1.00	.90@1.00	.85@1.05
Screenings	.80@ .90	.70@ .80	.65@ .75	.70@ .75	.75@ .80

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.25@1.35	$1.25@1.60	$1.90@2.00	$1.35@1.50	$1.25@1.50
1¼-in. lump	1.10@1.25	1.15@1.40	....	1.10	1.25@1.35
Egg	1.25@1.35	1.10@1.25	1.90@2.00	1.35@1.50	1.00@1.10
Nut	....	....	1.40@1.60	1.20@1.35	1.00@1.10
No. 1 nut	1.25@1.35	....	....	....	....
No. 2 nut	1.15@1.35	....	....	....	....
Mine-run	1.00@1.10	....	1.10@1.25	1.10@1.25	.95
Screenings	.80@ .90	.65@ .80	....	....	....

Receipts by Lake—Arrivals of coal by Lake for June and the season to date for this year and last year were as follows:

	1915		1914	
From	Hard	Soft	Hard	Soft
Buffalo	90,306	10,400	61,203	
Owego	15,685		23,036	
Toledo		18,730		63,467
Cleveland		20,808		12,640
Sandusky		10,325		49,236
Erie	27,044			
Ashtabula			7,222	
June total	133,035	60,263	91,461	125,343
Total season to date	258,246	163,570	171,253	256,416

INDIANAPOLIS

Thresher demand causes some improvement. Decline in screenings expected. Encouraging crop outlook.

The domestic lump trade shows some improvement due to the opening of the demand by threshermen, now busy with the wheat crop and soon to handle the oats. Whether this will increase the supply of slack enough to weaken the price remains to be seen; there is no doubt buyers of screenings are expecting a decline. There is no indication yet of weakness. Other grades of coal are down to their minimum, run-of-mine ranging from $1 to $1.20, according to quality.

The war-material industries of the state continue at capacity and an additional plant or two swings into this business weekly. There is pronounced improvement in operations at Gary, and allied industries feel a reflected benefit. In spite of material damage by insects and storms, Indiana will probably have 40,000,000 bushels of wheat, her oats crop promises to be the largest in years, and she raises 200,000,000 of corn, which is coming along satisfactorily. Coal men are counting on this to bring about a decided improvement in due time.

Retail dealers seem to be stocking up with Eastern coals in a normal way for the month of July. Summer prices on these still prevail. There is a fair movement of these coals from the yards into consumer's bins.

ST. LOUIS

Increase in the local circular. Prices better maintained and better feeling in the trade.

July 1 brought a welcome and longed-for strengthening of prices in the St. Louis market, particularly in the standard grades, where the prices have been demoralized for the past several weeks. During the past week intimations were received by the Kolb Coal Co. from some of the independent operators who are alleged to have brought about the recent price-cutting, that they were anxious to get better prices; the deadlock was broken by the Kolb Co. announcing, effective July 1, an advance on 2-in. shaker screened lump coal from 77½ to 85c. per ton f.o.b. mine. The Miller Coal & Coke Co. at the same time announced an advance of the same amount on standard lump. While the changes in other grades were not so pronounced there was a better feeling all along the line except in screenings, which fell off somewhat.

The market is now quotable as follows:

	Wilm. & Frnk. Co.	Sparta	Mt. Olive	Standard
6-in. lump	$1.25@1.35	$1.25	$1.25	$0.95
2-in. lump	....	.90	1.25	.85
3-in. lump	....	....	1.15@1.25	....
3x6 egg	1.25@1.35	....	....	.80
No. 1 nut	1.25@1.35	....	....	....
No. 2 nut	1.15@1.20	....	....	.80
No. 1 washed	1.25@1.35	....	1.35	....
No. 2 washed	1.15@1.25	....	....	....
No. 3 washed	1.20	....	....	....
No. 4 washed	1.15	....	....	....
No. 5 washed	.80	....	....	....
Screenings	.70@ .75	....	....	.75@ .77½

PORTLAND, ORE.

Summer storage prices in effect and but little business is transacted, as expected. City buys 2000 tons of coal and briquettes for schools.

Summer prices have been put in effect and Washington coals are now selling at $6.50 per ton in larger than three-ton lots or $7 per ton in one-ton lots. Wyoming is selling at $9 straight. These quotations cover deliveries within the first zone. The city has placed orders for 2000 tons of coal and coal briquettes, with three firms, this being the largest order placed here for some time. (See contract No. 362). Indications are that there will be very little if any coal imported here from Australia the coming fall and winter.

PRODUCTION AND TRANSPORTATION STATISTICS

ANTHRACITE SHIPMENTS

Anthracite shipments for June and the first six months of 1914-15 were as follows:

	June		6 Months	
	1915	1914	1915	1914
Phila. & Reading	852,411	944,816	5,413,271	6,031,648
Lehigh Valley	988,253	1,325,982	6,299,848	6,155,075
Cent. R.R. N.J.	609,127	839,514	3,798,849	4,389,087
Del. Lack. & West.	888,399	941 868	4,568,608	4,598,506
Del. & Hudson	697,894	661,248	3,803,792	3,415,875
Pennsylvania	446,690	470,652	2,969,954	3,217,088
Erie	693,089	738,175	3,747 082	3,990,027
Ont. & Western	140,239	207,931	993,900	1,148,483
Total	5,316,102	6,130,186	31,595,304	32,945,789

Stocks at Tidewater June 30 were 739,729 tons.

LAKE SHIPMENTS

Shipments through the Sault Ste. Marie Canals for June were: Bituminous, 1,624,535; anthracite, 300,631 tons.

SOUTHWESTERN TONNAGE

The following is a statement of the coal shipments by months from the four Southwestern states for the past two years to and including April of the current year:

1913	Missouri	Kansas	Arkansas	Oklahoma	Total
March	259,270	492,304	113,354	257,162	1,122,090
April	204,255	444,142	136,153	246,155	1,030,705
May	186,366	407,124	130,020	252,901	976,411
June	187,723	412,371	145,306	255,481	1,000,881
July	198,723	465,761	163,185	272,124	1,099,793
August	178,949	451,968	178,904	289,949	1,099,770
September	250,763	474,237	201,782	297,213	1,223,995
October	317,466	609,827	209,693	340,915	1,477,901
November	290,958	571,165	187,703	346,064	1,395,890
December	266,335	540,872	138,678	324,728	1,270,613
Total	2,924,728	5,782,194	1,943,861	3,534,842	14,185,625
1914					
January	277,609	526,300	162,056	333,125	1,299,090
February	259,270	492,304	113,354	257,162	1,122,090
March	263,593	501,841	165,037	296,484	1,226,955
April	179,723	378,192	87,002	239,443	884,360
May	165,395	370,097	95,749	241,180	872,421
June	185,731	490,561	133,350	273,692	1,083,334
July	177,093	513,312	117,016	234,648	1,042,069
August	201,992	453,675	157,803	244,103	1,057,573
September	233,195	569,114	160,233	254,973	1,217,515
October	280,958	632,784	186,990	319,439	1,420,171
November	252,105	591,383	141,554	332,515	1,317,557
December	285,547	643,213	123,737	352,267	1,404,764
Total	2,762,211	6,162,776	1,643,881	3,379,031	13,947,899
1915					
January	276,641	637,708	125,275	371,309	1,410,993
February	225,996	492,320	102,451	302,026	1,122,793
March	271,374	522,242	90,252	243,505	1,127,373
April	196,032	410,565	80,118	181,873	868,588

RATE DECISION

I. C. C. No. 7409—Reeves Coal Co. vs. Chicago, Milwaukee & St. Paul Ry. Co.

Complainant ordered a shipment reconsigned, provided the lowest rate between original point of origin and final point of destination would apply. Reconsignment was effected and lawful charges, higher than those which would have accrued at the lowest rate from point of origin to final destination, were collected; **Held,** That the case does not differ materially from one involving merely a misquoted rate. Complaint dismissed.

FOREIGN MARKETS

GREAT BRITAIN

Situation very uncertain and important developments expected. Restrictions of exports continues.

June 25—The situation in the coal industry has many interesting features, but they are not of a character to encourage or facilitate business. Much uncertainty for instance, prevails as to what the Government may think proper to do with regard to coal prices and in view of the further negotiations between colliery representatives and the Board of Trade in London this week, an early authoritative announcement on the subject is expected, but the inland trade has received something of a check pending that. Then there is the question as to whether there is any likelihood of the suspension of the Eight Hours' Act, which apparently has been under the consideration of the Miners' Federation of Great Britain this week, while in Wales trouble over the non-Unionist difficulty and the new agreement causes anxiety. Finally we have continued complaints concerning the restriction of exports, the main effect of which appears to be the depression of prices for the benefit of our customers in neutral countries, although, of course, the home market for some qualities has also been weakened. Altogether the situation is far from satisfactory, and important developments are expected.—The Iron & Coal Trades Review."

June 24—There is still general quietness in all branches of the steam coal trade. Shipments are slightly improving. Prompt supplies can be had at several shillings below current quotations. Quotations are approximately as follows:

Best Welsh steam	Nominal	Best Monmouthshires	$6.72@6.96
Best seconds	Nominal	Seconds	6.24@6.72
Seconds	$6.72@7.20	Best Cardiff smalls	4.80@5.04
Best dry coals	6.72@7.20	Cargo smalls	3.96@4.08

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—Chartering is very quiet and rates are approximately as follows:

Gibraltar	$3.84	Naples	$6.00	St. Vincent	$4.80
Marseilles	4.83	Alexandria	5.76	Rio de Janeiro	6.36
Algiers	3.86	Port Said	5.64	Monte Video	5.76
Genoa	5.88	Las Palmas	4.32	River Plate	6.00

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

For the official advertisements of bids wanted see the Contracts-to-Be-Let Section on Page 20.

+Indicates contracts regarding which official information has been received.

Recast

In the following table we give a list of all old contracts coming up for consideration during the ensuing week. The table gives our contract number, the name of the purchaser, city, tonnage and page on which the detail notice appeared.

No.	Purchaser	City	State	Tonnage	Page
817	Barrett Varnish Co.	Chicago	Ill.	3 (cars)	1048
856	Board of Education	Kansas City	Mo.	7000a	40
950	Board of Education	Linden	N. J.	200a	40
969	County Commissioners	Hillboro	N. D.	200b	41
988	Government Engineer	Atlantic City	N. J.	3000b	42

a Indicates anthracite coal. b Indicates bituminous.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

+No. 726—New York—All the bids on this contract (Vol. 7, pp. 916, 955, 1004, 1084, 1088, 1128), which provides for furnishing the local Fire Department with coal, have been rejected, and the contract will be readvertised. Address Fire Comr. Robt. Adamson, Municipal Bldg., New York City.

+No. 855—Wilmington, N. C.—This contract (Vol. 7, p. 1085), which provides for furnishing the United States Engineers at this place with about 13,000 tons of bituminous coal was bid on as follows:

Bidder	F.o.b. Cars at Wilmington	Southport*	Washington	Newbern	Morehead	B.t.u.
Tons	9000	2000	300	700	1000	
The Springer Coal Co.	$3.30	$3.85	$3.30	$3.30	$3.65	14,600
Cooper-Pocahontas Co.	3.30	3.75	3.30	3.30	3.65	14,750
The S. J. Patterson Co.	3.27	....	3.27	3.27	3.62	14,500
Smokeless Fuel Co.	3.30	3.75	3.30	3.30	3.65	15,100
The Chesapeake & Ohio Coal & Coke Co.	3.25	3.70	3.25	3.25	3.60	14,900
Alternate bid†	3.20	3.65	3.20	3.20	3.55	.....
Netherington & Co.	3.05	3.46	3.05	3.05	3.37	14,800
The Nottingham & Wrenn Co.	3.28	3.70	3.28	3.28	3.63	14,779
Maryland Coal & Coke Co.	3.25	....	3.25	3.25	3.60	14,850
Commercial Coal Co., Inc.	3.39	3.94	3.44	3.44	3.79	14,600
Pocahontas Fuel Co.	3.30	....	3.30	3.30	3.65	15,100
The C. Y. Blake Co.	3.30	3.75	3.30	3.30	3.65	14,850
Johns Bros., Inc.	....	....	3.25	3.25	3.60	14,850
Eastern Coal & Export Corp.	3.30	3.80	3.30	3.30	3.65	14,900
Jewette Bigelow & Brooks	3.30	3.65	3.30	3.30	3.65	14,900

*Delivered in bins. † Without restrictions as to guarantees.

Address Maj. H. W. Stickle, Corps of Engrs., U. S. Engineers' Office, Wilmington, N. C.

+No. 870—Peoria, Ill.—Bids on this contract (p. 1086) were received until 5 p.m., June 25. The successful bidder will be required to furnish a bond for $4000, and each bid is to be accompanied by a certified check for $200. Address Secy. Anna Rynearson, Bd. of School Inspectors, Room 203, City Hall, Peoria, Ill.

+No. 888—Fairbury, Neb.—This contract (Vol. 7, p. 1086), which provides for furnishing the G. D. Meyers Water & Light Commission at this place with about 2000 tons of coal will be let some time in July. The price as noted in the previous item, $2.95 should have read $3.75 per ton. Address G. D. Meyers Water & Light Commission, Fairbury, Neb.

+No. 892—Jacksonville, Fla.—This contract (Vol. 7, p. 1086), which provides for furnishing the U. S. Engineers' Office at this place with about 4000 tons of coal was bid on as follows: Logan Coal & Supply Co., Berwind's New River, $4.42; Weller Coal Co., Admiralty smokeless, $4.85; Clinchfield Fuel Co., Clinchfield coal, $4.24; Logan Coal Co. (exclusive of freight), Pratt lump, $2.75. Bids were also open for delivery at Tampa, the only bidder being the Tampa Coal Co. at $6.15 for Superior Pocahontas. Address U. S. Engineers' Office, Jacksonville, Fla.

+No. 893—Milwaukee, Wis.—Bids have been received on this contract (Vol. 7, p. 1086), which provides for the requirements of the Lighthouse Service, 12th District, as follows:

Bidder	Amount		Place of delivery.
Milwaukee-Western Fuel Co. (Milwaukee)	$800.00	*	Milwaukee, Wis., Anth.
Pennsylvania Coal & Sup. Co. (Milwaukee)	8632.80	*	Milwaukee, Wis., Bit.
Callaway Fuel Co. (Milwaukee)	815.00	*	Milwaukee, Wis., Anth.
Pittsburgh Coal Co. (Chicago)	540.00	*	Chicago, Ill., Bit.
Charlevoix Coal & Wood Co. (Charlevoix)	2464.50	*	Charlevoix, Mich., Anth. & Bit.
Wm. H. Pugh (Racine)	337.50	*	Racine, Wis., Bit.
C. Reiss Coal Co. (Sheboygan)	908.00	*	Sheboygan, Wis., Bit.
Central West Coal Co. (Menominee)	1143.75	*	Menominee, Mich., Bit.
George Kemp (Sault Ste. Marie)	556.50	*	Sault Ste. Marie, Mich., Bit.
Perry Coal Co. (Sault Ste. Marie)	567.00	*	Sault Ste. Marie, Mich., Bit.
Mich. Lumber Co. (Manistee)	866.00	*	Manistee, Mich., Bit.
C. B. Oliver (Escanaba)	1164.00	*	Escanaba, Mich.
Marinette Fuel & Dock Co. (Marinette)	1214.25	*	Marinette, Wis.

Recommended that the above bids he accepted as indicated*.

+No. 937—Amsterdam, N. Y.—About a dozen bids were submitted on this contract (Vol. 7, p. 1127), all of which were apparently the same as follows: Grate, $6.50; egg, stove and nut, $6.75; pea, $5.75. An extra charge of 25c. per ton will be made in event the coal has to be carried, and a discount of 25c. per ton will be allowed where payment is made by the tenth of the month succeeding delivery. Deliveries are to begin Sept. 1. Address Clk. Leslie L. Bedd, Bd. of Edu. High School Bldg., Amsterdam, N. Y.

New Business

No. 990—Kansas City, Mo.—The General Hospital will let a contract for 100 tons of mill run coal Aug. 1. The board of directors makes the contracts. Address Board of Directors, General Hospital, Kansas City, Mo.

No. 991—Storrs, Conn.—Sealed bids will be received until noon, July 20, for furnishing the Connecticut Agricultural College with coal as follows: 1000 tons anthracite egg; 200 tons pea; 100 tons stove; 50 tons nut. Bids should be made f.o.b. Eagleville, Conn., and deliveries are to be made during the period of Oct. 1 of the current year to Mar. 31 of next year. Separate bids should be submitted on each size. Address Connecticut Agricultural College, Storrs, Conn.

Contract No. 922—Rock Island, Ill.—The contract with the Standard Oil-Cloth Co. for two cars of screenings per week expires on Apr. 1. This company will contract in August for the supply for the following season. Address Standard Oil-Cloth Co., Rock Island, Ill.

No. 993—Kansas City, Mo.—The Southwestern Milling Co. buys its coal in the open market and will be interested in offers. Two cars a month of mill run are used. Address Purchasing Agent, Southwestern Milling Co., Kansas City, Mo.

+No. 994—Canton, Ill.—Sealed bids were received by the local City Government until 2 p.m., June 15, for furnishing coal required at the Ave. D. Pumping Station, during the year beginning July 1. Mine-run and screenings will be required. The successful bidder must furnish a bond for $500 guaranteeing the faithful performance of the contract. Address City Clk. Joseph Waugh, Canton, Ill.

+No. 995—Cedar Rapids, Ia.—The Board of Education at this place will receive bids until 7:30 p.m., July 13, for furnishing coal as follows: 5000 tons of fancy Iowa or Illinois steam coal delivered on sidings; 30 tons lump coal to be delivered as designated; 60 tons of anthracite to be delivered in bins on or before Sept. 1. All bids must be submitted on blank forms which may be obtained on application. Bids will be received at the same time for delivery of the coal from the cars to the various buildings. Address Secy. H. L. Cooper, Cedar Rapids, Ia.

No. 996—Baltimore, Md.—The American Smelters Securities Co. is completing a new brass foundry at this place, for which it is now negotiating for the fuel supply. The plant will be in operation in about two months, and shipments are scheduled to start Sept. 1. About 2000 tons of egg coal will be required. Address Purchasing Agent, American Smelters Securities Co., 120 Broadway, New York City.

+No. 997—Salina, Penn.—The School Board for Kiskiminetas Township will receive bids until 10 a.m., July 14, for furnishing the coal required at the 20 schools in the district. Address W. J. McCauley, Bd. of Edu., Salina, Penn.

+No. 998—Kansas City, Kan.—The municipal contract for furnishing the city, water-works plant, electric-light plant, city buildings, etc., will be let about Aug. 1. though no notices have as yet been sent out. About 20,000 tons of mill-run coal will be required. Address Pur. Agt. Amos Riddle, City Hall, Kansas City, Kan.

+No. 999—Brookville, Ohio—The Board of Education at this place will receive bids until 7:30 p.m., July 12, to furnish its annual coal requirements for the fiscal year beginning July 20. Address Clk. J. M. Grau, Bd. of Edu., Brookville, Ohio.

1000—Independence, Mo.—The Independence Ice & Cold Storage Co. at this place is considering a contract for furnishing its coal supply, which aggregates about two cars per month. It uses slack and mill-run coal, and at present is buying in the open market. Address Mgr. A. D. Hatton, the Independence Ice & Cold Storage Co., Independence, Mo.

+1001—Wilkes-Barre, Penn.—The Board of Education at this place usually contracts for its fuel requirements some time in August. The call for bids is advertised and the business is let on a competitive basis. About 4000 tons of coal is required, with prices varying from $2.40 to $4.20 per ton. Address Board of Education, Wilkes-Barre, Penn.

+1002—Lafayette, Ind.—The Board of Public Works at this place will receive bids until July 14 for furnishing the coal required during the ensuing year at the local waterworks, crematory and fire department. Address Committee on Supplies, Board of Public Works, Lafayette, Ind.

1003—Kansas City, Mo.—The Wesley Hospital at this place is receiving bids for about 150 tons of bituminous coal. The contract will be let about Aug. 1. Address Board of Directors, Wesley Hospital, Kansas City, Mo.

1004—Mitchell, S. D.—The County Commissioners will receive bids until 2 p.m., July 16, for furnishing Davison County with the following grades of coal: Pocahontas lump to be delivered at the Court House; same to be delivered to any part of the city; Hocking lump delivered to Court House; anthracite, egg and stove delivered to any part of city. Address County Audr. J. M. Crampton, County Comrs., Mitchell, S. D.

1005—Cleveland, Ohio—The Board of Education at this place will receive bids until noon, Aug. 2, for furnishing and delivering coal to the various school buildings during the seasons of 1915 and 1916. The approximate tonnages are as follows: Anthracite, 300 tons; bituminous lump, 3000 tons; nut, 2500 tons; slack, 25,000 tons; semibituminous mine-run, 4000 tons; lump, 4000 tons. Specifications and blank forms for bidding may be obtained on application. Address Dir. of Schools F. G. Hogan, School Headquarters, Rockwell and East Sixth St., Cleveland, Ohio.

1006—Kansas City, Kan.—The local plant of Proctor & Gamble Manufacturing Co., dealer in soap, will be in the market about Aug. 1 for 200 tons of bituminous coal. Address Purchasing Agent, Proctor & Gamble Mfg. Co., 19th and Kansas St., Kansas City, Kan.

1007—New Castle, Penn.—The School Board at this place will contract some time in August for its annual requirements of coal. The present contract is on the following basis: 1800 tons of ¾-in. coal at $2.33, 550 tons of slack at $1.92, prices including cost of delivery to buildings. The call for bids is advertised. Address Board of Directors of School District, North St., New Castle, Penn.

1008—Galesburg, Ill.—The County Commissioners at this place will receive bids until 10 a.m., July 7, for furnishing the coal requirements of the Knox County Court House and Knox County Heating Plant for the year beginning July 1. Nut, slack, mine-run, egg and lump coal will be required. Bids are to include cost of delivery to the Court House and heating plant. The successful bidder will be required to give a bond guaranteeing the satisfactory performance of the contract. Address County Clk. F. L. Adams, Galesburg, Ill.

1009—Independence, Mo.—The Independence Stove & Foundry Co. will contract for about 12 cars of slack coal some time during August. Address Secy. E. F. Lough, Independence Stove & Foundry Co., Independence, Mo.

1010—Kansas City, Kan.—The Kansas City Soap Co. at this place is considering the purchase of 12 cars of mine-run and lump coal, deliveries to be made at the rate of one car per month. The company has heretofore confined its purchases to the open market. Address H. L. Fetters, Kansas City Soap Co., Shawnee and Railroad St., Kansas City, Kan.

+1011—Ritzville, Wash.—The School Board at this place received bids until July 5 for furnishing 125 tons of coal to be delivered to the various school buildings on or before Sept. 1. Bids were particularly requested on Roslyn Cascade Special Steam coal, but will also be considered on other grades. Address Dist. Clk. John Truax, School Dist. No. 1, Ritzville, Wash.

1012—Pleasant Hill, Mo.—George M. Kellogg, a florist at this place, will contract for a year's supply of coal some time during the current month. About 20 cars of slack coal per month will be required. Address Pur. Agt. N. F. Parker, George M. Kellogg, Pleasant Hill, Mo.

+1013—Jackson, Miss.—Bids were received by the Mississippi State Penitentiary until noon, July 6, for furnishing two carloads of coal for the Oakley and Parchman convict farms. The bids were requested f.o.b. the destination with freight prepaid. Address Secy. J. J. Coman, Mississippi State Penitentiary, Jackson, Miss.

+1014—Keewatin, Minn.—Sealed bids were received by the Town Government until 8 p.m., June 30, for furnishing approximately 500 short tons of coal. Deliveries are to be made between July 14 and Jan. 13. Bids were requested on Elkhorn, Ky., lump, mine-run, screenings, Youghiogheny screened lump, mine-run, screenings. Address Village Clk. C. W. Extrum, Keewatin, Minn.

1015—Kansas City, Mo.—The City Ice Co. is said to be considering entering into short contracts for its coal requirements. About one car per day is required and it is stated that it is considering purchases in 30-car lots. Address F. D. Whiting, City Ice Co., 21st and Campbell St., Kansas City, Mo.

+1016—Bel Air, Md.—The Board of School Commissioners for Harford County received bids until noon, July 7, for furnishing its annual coal requirements. No. 2 screened anthracite coal is required almost exclusively. All deliveries are to be completed on or before Oct. 1. Address Secy. Charles T. Wright, Bd. of School Comrs., Bel Air, Md.

1017—Mobile, Ala.—The city will receive bids until noon, July 14, 1915, for furnishing a year's supply of coal, to be delivered at the Spring Hill and Bienville pumping stations. Copy of specifications can be had by applying to Supt. C. W. Soost, of Mobile Water Works. Bids must be accompanied by guaranteed analysis. Address Comr. Harry Pillans, Mobile, Ala.

1018—Kansas City, Mo.—The Kelley Milling Co. at this place will probably contract about Aug. 1 for its fuel requirements, which amount to about 20 tons per day. It uses Cherokee slack coal. Address J. M. Kelley, Jr., Rochester and Park Ave., Kansas City, Mo.

+1019—Allentown, Penn.—The School District of North Whitehall Township will receive bids until 5 p.m., July 10, for furnishing 100 tons clean chestnut coal to be delivered to the various school buildings on or before Sept. 13. Address Secy. A. N. Kuhns, Orefield, Penn.

+1020—Adrian, Mich.—The State Industrial Home for Girls at this place will receive bids until noon, July 13, for furnishing about 2000 tons of domestic lump coal and 250 tons of chestnut coke. Bids should be submitted f.o.b. cars on side track at the home. Address Treas. Rolla L. Taylor, State Industrial Home for Girls, Adrian, Mich.

1021—Kansas City, Mo.—The Western Sash & Door Co. will contract about Aug. 1 for 20 cars of mill-run coal. Address F. J. Huttig, Western Sash & Door Co., Independence Rd. and White Ave., Kansas City, Mo.

+1022—Chicago, Ill.—The Municipal Tuberculosis Sanitarium received bids until noon, July 9, for furnishing the coal requirements of the Sanitarium according to the specifications on file. A certified check for $300 was required with each bid. Address Board of Directors, Municipal Tuberculosis Sanitarium, North Crawford and Peterson Ave., Chicago, Ill.

Contracts Awarded

No. 650—Pittsburgh, Penn.—This contract (Vol. 7, pp. 835, 918) has been awarded to various coal companies. Address Supt. of Supplies C. N. McKee, Fulton Bldg., Pittsburgh, Penn.

+No. 747—Pittsburgh, Penn.—This contract (Vol. 7, p. 917), which provides for furnishing the various pumping stations and the City Hall and Hospital, has been awarded to a number of the different local companies. Address Dir. F. P. Booth, Dept. of Supplies, 314 Oliver Bldg., Pittsburgh, Penn.

+No. 631—Milwaukee, Wis.—An additional award on this contract (Vol. 7, pp. 795, 876, 918), providing for the requirements of the Milwaukee Fire Department, has been made to the **Kanawha Fuel Co.,** at $3.41 per ton for 800 tons of Pocahontas, and $7.50 per ton for 553 tons of anthracite. Address Comr. F. G. Simmons, Department of Public Works, Milwaukee, Wis.

+No. 556—Grand Rapids, Mich.—This contract (Vol. 7, p. 709), which provides for furnishing the local Board of Education with its fuel requirements, aggregating between 7000 and 8000 tons of West Virginia coal, has been let as follows: **Bennett Fuel & Ice Co., Kanawha,** $2.94, and New River, $3.80; **Breen & Halladay,** anthracite, $8. Address Board of Education, Grand Rapids, Mich.

+No. 729—Vicksburg, Miss.—This contract (Vol. 7, pp. 916, 1984) which, provides for furnishing the Third District of the Mississippi River Commission with approximately 10,000 tons of coal was awarded to the **West Kentucky Coal Co.,** on June 18. The contract will run during the fiscal year ending June 30, 1916. Address Maj. Engrs., J. R. Slattery, U. S. Engrs. Office, Third Mississippi River Dist., Vicksburg, Miss.

No. 766—South Bethlehem, Penn.—This contract (Vol. 7, p. 956), which provides for furnishing coal to the local schools, has been awarded to the **Stahn Coal Co.** as follows: Pea, $3.90; nut, $5.75; stove, $5.50. Other bids were: South Bethlehem Coal Co., pea $3.80, nut $5.65, stove $5.50; Artificial Ice Co., pea $4.05, nut $5.70, stove $5.55; Sancon Supply Co., pea $3.95, nut $5.85, stove $5.70. Address Secy. George E. Borman, Bd. of Edu., South Bethlehem, Penn.

No. 674—New York, N. Y.—Awards on this contract (Vol. 7, pp. 836, 876 and 956), with reference to the supply of coal for the schools in the Borough of Richmond, action upon which was deferred when the contracts for the other boroughs were awarded, have been made by the Board of Education. The contract was awarded to the **Richmond Ice Co.,** the only bidder. Address Supt. of School Supplies Patrick Jones, Board of Education, Park Ave. and 59th St.

+No. 740—San Antonio, Tex.—This contract (Vol. 7, pp. 917, 1084), which provides for furnishing the San Antonio School Board with its fuel requirements during the ensuing fiscal year, has been awarded to the **Mission Wood & Coal Co.** at $5.25 for Wilburton nut and $6.35 for Carona 6x3-in. fancy lump. Of the 10 bids received on this business this company was the lowest and best. Address Business Agt. Paul H. Scholz, Bd. of Edu., Prudential Bldg., San Antonio, Tex.

No. 678—New Brunswick, N. J.—This contract (Vol. 7, pp. 876, 1048), which provides for furnishing the fuel requirements of the local Board of Education for the ensuing year has been awarded to **P. M. Welsh,** on the following basis per gross ton: Egg and stove, $6.57; pea, $4.99; buckwheat, $3.51; bituminous, $4.10. The coal is to be weighed on the city scales and delivered and stored as required. Address Secy. Morris Bauer, Supply Com. Bd. of Edu. New Brunswick, N. J.

No. 598—New Orleans, La.—This contract (Vol. 7, p. 794, Vol. 8, p. 40), which is said to cover the fuel requirements of the United Fruit Co., for the next two or three years, has been awarded to the **Warrior Black Creek Coal Co.,** and the **Pittsburgh Coal Co.,** each concern getting about one-half. It is stated that the Pittsburgh Co. has had this contract exclusively for sixteen years and had it not been for this the Alabama Co. would probably have obtained the entire contract. The coal will be shipped by the L. & N. R.R. Address Pur. Agt. United Fruit Co., New Orleans, La.

+No. 730—Louisville, Ky.—This contract (Vol. 7, p. 916), which provides for furnishing the local Board of Education with its fuel requirements during the fiscal year beginning July 1, has been awarded as follows: **Franklin Coal Co.,** 6277 tons of nut and slack, $1.93; **Pittsburgh Coal Co.,** 1335 tons smokeless mine-run, $3.15; **St. Bernard Mining Co.,** 386 tons lump, $2.25. The contract was let on a heat-unit basis, but no test of the coal will be made unless it fails to give satisfaction, in which event the contract will be cancelled and coal bought in the open market. Address Business Dir. Samuel D. Jones, Administration Bldg., Eighth and Chestnut St., Louisville, Ky.

No. 733—Providence, R. I.—This contract (Vol. 7, p. 917), which provides for furnishing the Board of Control and Supply of the State of Rhode Island with coal during the ensuing year, has been awarded as follows: **H. N. Hartwell & Son, Inc.,** 11,000 tons of "Alpha Special" to Cranston, R. I., at an average of $3.905;**Providence Coal Co.,** 900 tons of "New River" coal for the State Home and School at $4.58, five tons for the Providence Armory and 20 tons for the Providence Armory at $5 per ton; **M. L. Cobb,** 1000 tons of "George's Creek" coal for the State Sanatorium at $4.32; **Logan Coal Co.,** 700 tons of Logan No. 2 to the Rhode Island State College at $4.10. Address Secy. G. R. Parker, Bd. of Control and Supply, State House, Providence, R. I.

Contract Notes

Birmingham, Ala.—The Alabama Co. has closed a contract for 25,000 tons of coal with the Southern Cotton Oil Co., for their mills in this section.

Chile, S. A.—The Chilean Government have issued a decree requiring a deposit of $24.33 for every ton of coal taken by vessels under belligerent flags which sail direct to European ports.

Warsaw, Ind.—The Light & Water Department at this place consumes about 9000 tons of Cambridge (Ohio) coal which usually costs about $2.55 per ton f.o.b. Warsaw. The business is done on competitive bids.

Birmingham, Ala.—The Southern Ry. has let contract for 500,000 tons of coal through Vice-president E. H. Chapman. Two hundred thousand tons will come from the Pratt Consolidated Coal Co., and the other 300,000 tons divided among the Stith Coal Co., Bryan Coal Co., Barney Coal Co. and others.

St. Paul, Minn.—The indications are that the Northern Coal & Dock Co. will be the successful bidders on this contract instead of the Peoples Coal & Ice Co. as previously noted (Vol. 7, p. 1128). The contract provides for furnishing about 17,000 tons of various grades of coal for the City Government.

Brookhaven, Miss.—The Light & Water Works Department at this place consumes about 2600 tons of Kentucky mine-run coal which usually costs about $3 per ton. The company does not contract but the business is let on competitive bids. Address Supt. B. S. Purser, Light & Water Works Department, Brookhaven, Miss.

Crawfordsville, Ind.—The contract to supply 575 tons of coal to the Montgomery County institutions and buildings has been awarded to **Vaughn & Casey.** The bids were for 350 tons of mine-run at $2.55, and 255 tons of mine-run at $2.25. The contract calls for a total expenditure of $1400.75, and in all there were four bidders.

Buffalo, N. Y.—The contract for furnishing the County Home and Hospital of this county with 2500 tons of slack coal has been awarded to **Spaulding & Spaulding.** For furnishing the County Penitentiary with 3600 tons of slack, C. A. & M. Kaiser were the successful bidders at $1.85 per ton on cars. Both bids were practically the same.

Philadelphia, Penn.—Reports have reached here that the Argentine Republic is in the market for 50,000 tons of bituminous coal. The information comes from Buenos Aires that the purchase has been authorized by the home government. It is provided that the cost shall not be in excess of $225,000, and the purchase is to be in charge of that government's ambassador at Washington.

U. S. Production for the Half Year—Output of bituminous coal in the United States for first six months of 1915 is estimated by the Geological Survey as between 180,000,000 and 190,000,000 short tons. The rate of production has been from 85% to 90% of the average for the previous year. This is considerably less than for the corresponding period in 1914, and is little, if any, greater than the output during the last half of that year. Production this year decreased after January, reached the low ebb in March and April, and is now on the increase. Output of anthracite has fallen from 3% to 5% below average for 1914.

The Big Four R.R. Contract—This road is reported to have contracted for 150,000 tons of Harlan County, Ky., coal for shipment during the year, beginning July 1. The contract was distributed among the Harlan Coal Co., the Southern Coal & Coke Co., the Bewley-Darst Coal Co., and the Reliance Coal Co., about a third of the order going to the first named company. This is said to be the first time that the Big Four has ever purchased coal from Eastern Kentucky mines on the Louisville & Nashville, most of their requirements having been obtained in West Virginia. Deliveries will be made at Ohio and Southern Michigan coaling points.

COAL AGE

Vol. 8 NEW YORK, JULY 17, 1915 No. 3

Our Export Coal Trade

Are we taking advantage of all the opportunities now being given us to increase our export coal trade so as to make the United States the greatest nation in this particular field, as it is in output, consumption and coal reserves?

* * *

THE coal tonnage sent overseas during the month of June would seem to show that at last we are reaping the benefit of our more or less persistent effort. The export tonnages last month from our principal ports, compared with those of September, 1914, are as follows:

	June, 1915	Sept., 1914
Hampton Roads	605,000	433,000
Baltimore	325,000	128,000
Philadelphia	105,000	59,000

Our coal exporters are making strong endeavors to increase their sales of coal abroad; it is equally true that in this work there is vast room for improvement in both efficiency and effort. The results of this unexampled increase in export tonnage are: First, the people in foreign countries are learning that they cannot depend on obtaining sufficient shipments of British coal owing to various causes resulting from the war. Second, they have also learned that United States coals can be had that will do the work required just as well as any but the very best Welsh coal (this being entirely out of the market at present). Third, United States coals can now be bought in many foreign markets more cheaply than can British fuel.

For these reasons inquiries for our coals have poured in upon us, and the fact that our exports during the past six months have not been greater is due to the scarcity of ships' tonnage as well as to the indisputable truth that our exporters are not accustomed to selling at delivered or c.i.f. prices.

The real fight for the coal-export trade of the world will come after the war is over.

Are we preparing for that time, and do we intend to try to keep what trade we may secure in the meantime? The present situation is going to be of great benefit to us then. Other people will have learned—because they are now being forced to learn—how to buy and to use our coals, and they will then be aware that the latter are of excellent quality.

But the British and German coal interests are not going to give up without a fight the foreign business that they have spent many years and much hard work and money in acquiring. Even now the British exports for the first five months of the year show a decrease of 35 per cent. over the corresponding period of the previous year (for May the decrease was 39 per cent.). But it must be remembered that a vast tonnage, probably 10 to 12 million tons per year, has been withdrawn from American trade and is being used by the navies of the allied governments. It would seem a wise plan, therefore, for our coal-sales agencies to begin at once to plan how they may best keep the foreign business they are now having presented to them. Wide avenues of trade are being opened to them, and they are learning the ocean-transportation end—the key to the whole export matter.

THE WAY TO have our share of the coal-export trade is to go after it intelligently and systematically — selling coal of good quality at fair prices. Such a campaign would win.

All of this will help us immensely when the real fight for commercial supremacy comes on after the war. But we must systematize our knowledge and our methods and not allow our efforts to relax. We have much to learn from the British shippers who in 1884 were exporting more coal than we are now doing.

The large coal companies should work together more. What benefits one now will benefit all in the end. At present these companies are fighting each other in every way—a fact that the foreign buyers have learned and are making use of to their own advantage.

Few of our exporting companies know foreign trade conditions. Grave errors have been made in selecting foreign representatives, nearly all of whom had everything to learn regarding foreign customs and usages — few of them being able to speak any language save their own.

Why would it not be both profitable and wise for the Bituminous Coal Association or any other association of coal sellers and operators interested in the export trade, such as the Smokeless Coal Operators of West Virginia, to establish a bureau of information regarding foreign trade? The purpose would not be to sell coal, but to gather all available and useful data on foreign coals and markets, prices, analyses, uses, buying and selling methods, specifications, ocean freights and ships, dock and harbor facilities, names of the large users and buyers, etc.? Such a bureau could be made of immense value to those to whom the information gathered would be available; it need not interfere in the least with the selling activities of any company.

Such an office could be used to disseminate general information to foreign buyers and users regarding our coals; it could be made a headquarters for all foreign buyers coming to this country. *Coal Age* would be glad to assist in the establishment of such a bureau and to render every possible aid in obtaining information for it.

Written by F. R. WADLEIGH

Ideas and Suggestions

Prohibition from a Miner's Viewpoint

By an Ohio Superintendent

It appears to me that West Virginia is likely to suffer for want of miners if something is not done to make amends for the suppression of the liquor traffic in that state. As evidence of the unpopularity of that measure and its effect in driving away miners I submit the following letter:

Scarbro, W. Virginia.

Mr. O. P. Rater, Superintendent,

My Dear Super:

I hope you forgive me, because I apply to you for me and Martin again a job. Here is a bad time and bad place for us. Too much and too very much dry. These place back in the West Virginia state now work every day. But we dont care, if your mine work three days a week we should like to come back in your again coal mine. If you can give us again some place for work, maybe wet dog hole, I dont care. Who want to live here and work these mines, alright, but no good for us. Too wild and too very dry. Please write me at once and give we greeting to Mr. Bass. Remaining Yours very truly,

STEVE UNGARY and MARTIN MANCO.

Something news on other side Mr. Super.

I dont drink here since September 30, only coffee and water, no whiskey, nothing. Please write me right away yes or no. The trouble is too much dry and too very much far from Mingo Junction.

Me and Martin no get job close to some place where we can get some whiskey we pretty soon go back and join Franz Josef's army. Lots of whiskey there now.

This is a true copy, word for word, of a letter I received from two Austrians who for a time were working in southern West Virginia. Now the thought comes to me, are we doing right by these miners? The great state of West Virginia is dry; others of the large coal-producing states of the Union are in the dry column or are straining every effort to get there. The curse of intemperance comes with these foreign miners from the East. We stop them from buying liquor here, from frequenting the saloons, from having the only kind of a good time they know, and what are we giving in return? What are we giving them to take the place of this habit?

We cannot dodge the issue—human nature is the same all the world over, and it is a scientific fact that if you would put an end to a habit of any kind in a man, woman or child, you must give them something in place of it. You must divert their minds into channels along other lines, give them some place with other attractions, where they can spend their leisure hours in enjoyments that will tend to make them forget the habit they have renounced.

Now do not think I am in favor of saloons or of the liquor evil, for personally I am and have been a total abstainer and hope to see the day when it will be illegal to manufacture or sell alcoholic liquors as a beverage in the United States. Nevertheless, I stick to the point and believe that we have no right to deprive these miners of their enjoyments, liquor drinking, or of their poor man's club, the saloon, unless we can give them in return something besides work that will take the place of these evils.

West Virginia coal-mine operators have done much for the uplift and social betterment of the mine worker, but much yet remains to be done. Nation-wide prohibition is coming in the United States, so I desire to give this word of warning to coal-mine operators and officials: Be prepared to give the mine workers, by education and otherwise, something to fill the void or be prepared to face an evil from the foreign miner that will be worse than his liquor habit.

One Method of Reducing Coal Mine Accidents

By F. M. McDaniel*

From an examination of the fatal accident reports of the different coal-mining companies in the large coal-producing states for the past few years, it will be noted that these accidents are mainly owing to contributory negligence on the part of the miners and that the greater number of these fatalities are due to falls of coal and slate.

No doubt many of these accidents could be avoided if the miners would exercise and put into practice the safety precautions with which they are familiar and obey the instructions given by the mine foremen, firebosses and other underground officials.

Shakespeare has said, "I could better teach twenty what were good to be done than be one of the twenty to follow mine own instructions." So it is with the average coal miner. He is familiar with and recognizes the different dangers met with in coal mining and the methods and ways of eliminating possible accidents from these dangers. Too many miners, while waiting on empty cars or for their places to be cut or what not, will sit about telling their "buddies" how much they know about the prevention of accidents, when they should perhaps at that very moment better be in their own working places taking down a loose piece of slate, placing a prop or complying with some other order given by the mine foreman or one of his assistants.

The miner has too much of a tendency to gamble with chance. Although he may know that, even when all safety precautions have been complied with, mining still remains a hazardous occupation, he will deliberately work under loose slate or coal and will do other things that he knows are making his work perhaps doubly dangerous. He fosters the belief that because he has worked under conditions similar to those under which he is now working and has escaped injury he will escape again. He bases these makeshift arguments on a bad precedent and neglects to consider that his former escape was probably owing only to a strange caprice of fate that is not always repeated under similar conditions.

If the miners could be taught or induced to put into practice what they really know concerning safety measures and the different precautions against mine accidents; to give stricter obedience to the state mining laws, the company rules and foremen's orders; to weigh carefully and decide upon the value of the safety information readily accessible; to take more pride in their working places; to think less of getting the almighty dollar by taking risks that are not required or expected of them, and to quit trying to load as much or more coal than the other fellow by the expenditure of less muscle and brains, no doubt the number of both fatal and nonfatal accidents in this country could be materially reduced.

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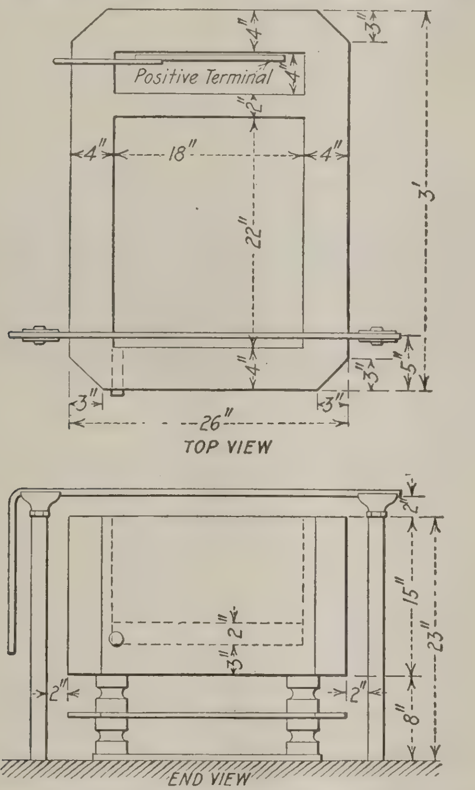
*Mining Engineer, Clarksburg, W. Va.

An Electrolytic Forge

By M. D. Cooper*

An electrically operated forge for use in mines is illustrated herewith. A forge similar in construction to the one illustrated in the figure has given satisfactory service underground for over 6 yr.

Essentially, the forge consists of a concrete tank mounted on suitable insulation, equipped with an iron plate for use as a positive terminal and supplied with the necessary wiring. The tank is 36 in. long, 26 in. wide and 15 in. high. The walls are 4 in. and the bottom 3 in. thick. For the purpose of preventing the piece to be heated from coming in contact with the positive plate and thereby causing a short-circuit, the tank is divided into two compartments by means of a 2-in. wall. This wall, however, does not extend to the bottom of the tank; there is an open space 2 in. high between the bottom of the wall and the bottom of the tank to allow the passage of current and also to facilitate draining when necessary. A drain pipe stopped by a wooden plug is provided as shown in the figure.



TOP AND END VIEWS OF THE ELECTRIC FORGE

The larger compartment of the tank, in which heating is done, is of ample size for most underground requirements. A smaller size was satisfactory for heating rivets only, but experience has shown the necessity for a tank of the dimensions given in order to heat pieces longer than the ordinary sizes of rivets. In the smaller compartment of the tank a wrought-iron plate 14 in. long, 9 in. wide and ½ in. thick is placed, to which wire carrying the positive current is attached.

By means of two sets of four insulators in each set, the tank is insulated from the earth. The foundation is brought to the floor level. On the foundation is placed an iron plate of somewhat shorter dimensions than the bottom of the tank. Near each corner of the plate is located an insulator as shown. A second plate a little longer and wider than the first is placed over the insulators.

It has been found that this upper plate must extend over the lower one in order to prevent any drippings falling from the upper to the lower plate. The second set of insulators is placed directly above the first, and the tank is then supported on the upper set. In general, the insulators have been found to last about a year, when they must be taken out and cleaned or, if cracked, replaced by new ones. To change all of the insulators requires only a few minutes.

The return current is carried by a piece of 0000 trolley wire, which has been found large enough in current capacity and stiff enough to support the pieces to be heated. The wire is held by trolley hangers, rigidly supported near each side of the forge by pieces of 1½-in. pipe.

In operation the tank is filled with water to a depth of 6 in., which requires about 12 gal. Then about 5 lb. of common salt is added, the solution of salt and water forming the electrolyte. The current, which is supplied at 250 volts and must always be direct current, having been turned on, the piece to be heated is held in a pair of tongs the handles of which are rested on the piece of trolley wire supported across the tank. When the rivet or other metal to be heated is lowered into the electrolyte, current will flow from the positive terminal to the piece held in the tongs, which then becomes the negative terminal. A layer of hydrogen is formed around this terminal, causing a high resistance at the surface of the piece it is desired to heat. The resistance results in the development of heat, the amount being proportional to the I^2R loss.

In this manner a rivet or other similar piece of metal may be brought to a high temperature in a few seconds. After the current is shut off, the material may be quenched by thrusting it into the same solution in which it was heated.

He Won (?)

Two little boys were playing on the sidewalk—or rather one little boy was playing; the other couldn't very well, as he was all swathed in bandages, smelled of arnica, and was generally disfigured. A kind-hearted stranger curious to know what had happened asked how he had been hurt. The larger boy answered for the injured one: "We were playing a game, who could lean out of the window the farthest, and he won."

Doesn't this present a true picture of the coal operator who cuts prices below the cost of production or who cuts the cost of production by butchering his mine?

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*Ellsworth, Penn.

Wire Rope and Its Application*

By Bruce W. Bennett†

SYNOPSIS—To be of value wire rope must be of known quality. It must possess strength, flexibility and tenacity in well-balanced proportion. To secure the results desired great care is exercised throughout the entire process of manufacture. Carelessness or ignorance on the part of the user may render useless the utmost pains and skill of the maker. The wise purchaser therefore studies the conditions of service involved and adapts his rope and apparatus to them, thus securing maximum service for a given outlay.

Although wire rope has been used as a mechanical appliance for nearly 5000 years, it is commonly regarded as a modern invention. During the long period that has elapsed since the first records of its use, wire rope has passed from a crude to a highly developed product, and the purposes for which it is employed have increased many-fold.

In no other branch of industry is there a greater demand for material of proven integrity than in the production of wire rope, for it might be truthfully said that it is born to be abused. It is subjected to tremendous tensile stresses, constant bending, abrasion, corrosion and the peculiar internal changes or molecular readjustments produced by vibration.

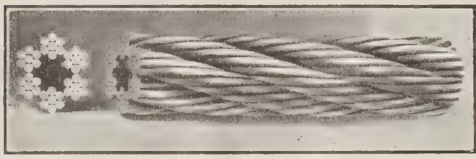

FIG. 1. A 6x7 HAULAGE TRANSMISSION AND STANDING ROPE

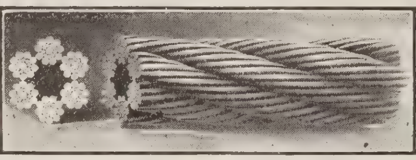

FIG. 2. A 6x19 SEALE CONSTRUCTION, TWO SIZES OF WIRE

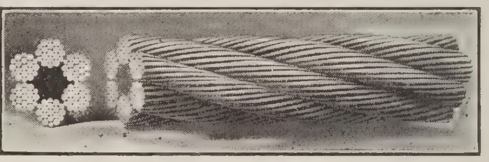

FIG. 3. A 6x19 HOISTING ROPE WITH THREE SIZES OF WIRE

Wire rope as made today is the product of the metallurgist and the mechanic. Every process—from the smelting of the ores, the rolling of billets and rods, the cold drawing of the wires and the many heat treatments they receive down to the stranding or laying up of the cable—is conducted with mathematical precision. The chemist sees that only steel of the proper analysis is used, the electric pyrometer insures uniformity in heat treatments and the various testing machines clearly establish the quality of the product before it is allowed to leave the mill.

Steel for the manufacture of ropes commonly used in the coal fields is the product of acid open-hearth furnaces, and the utmost care is exercised throughout the process of manufacture to insure that the finished product shall be of the desired analysis and of sound structure.

After the material has been cast into ingots and rolled to the form of rods, it is thoroughly cleaned and drawn through dies to the required diameter. Drawing greatly increases the strength of the wire and decreases its elongation under test, but if continued beyond certain well-defined limits, will make the material so hard and brittle as to be useless. To prevent such a contingency the wire is given several annealings, or heat treatments, which when properly conducted restore it to its original state of toughness and ductility, as well as bringing back its elasticity.

Heat Treatments Are Carefully Conducted

The heat-treatment processes are conducted with great care, and nothing is left to chance. The electric pyrometer insures that the wires receive just the degree of heat necessary to produce the desired result. A further check on these processes is secured by means of the microscope.

The very process of drawing the rope wire to a certain extent furnishes proof of the latter's quality, but careful tests for tensile strength, elongation and torsion are conducted by experts. Each and every coil is tested before it is allowed to enter the rope mill.

When the wires are taken into the rope mill they are wound upon spools and placed in a machine which so operates that they are laid into strands composed of 7, 19 or more wires, without any torsion being placed upon them. Each wire receives a heavy lubrication in this process. The strands are then laid about a heavily lubricated center usually composed of hemp, in much the same manner as that in which the strands themselves are built up, the same means being employed to eliminate torsional stresses.

The trade names which have been given to wire ropes of varying degrees of tensile strength are iron, crucible cast steel, extra strong crucible cast steel, plow steel and monitor plow steel. The tensile strengths will range from a minimum of 60,000 lb. per sq.in. of cross-section of stock for iron to approximately 280,000 lb. per sq.in. for monitor plow steel or its equivalent. The ropes most commonly used in the coal field are of the crucible cast steel grade and will approximate 200,000 lb. per sq.in. in tensile strength.

Most wire ropes have a hemp center, the name given to designate various types of fibrous material. In places where ropes have to withstand severe heat, soft-iron centers are substituted, and where crushing stresses are encountered or additional strength must be secured, steel centers are adopted. Asbestos centers, while heat-resisting, rapidly disintegrate and are of practically no value.

It is important that only good centers be used. If the hemp center disintegrates or breaks, the strands have a tendency to fall inward, causing the rope to collapse. When one or more strands do this, even tension is destroyed, and those strands having to bear the greatest stress will probably break.

The lay of a rope is the direction in which the wires and strands are twisted. There are three standard kinds of lay—right-hand lay, left-hand lay and Lang's lay, commonly known as lang-lay. In a right-hand lay the wires are twisted to the left and the strands to the right. In a left-hand lay just the opposite is true. In a lang-lay rope the wires and strands are both twisted in the same direction.

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*Abstract from a paper presented before the Shamokin and Mt. Carmel Mining Institute.

†American Steel & Wire Co., Wilkes-Barre, Penn.

The length of lay of a rope is the distance from the crown (top) of a strand to the next crown of the same strand; that is, one complete twist or revolution of 360 deg. from the crown of one wire to the succeeding crown of the same wire. The standard length of lay for hoisting rope is 7 diameters, which in the case of a 1-in. diameter rope would be a 7-in. lay. Shortening the lay of a rope adds to its flexibility. Increasing the length of the lay increases the stiffness.

Five different types of construction ordinarily employed in laying up wire rope are—a 6x19 3-sized wire; a 6x19 1-sized wire; a 6x19 Seale patent construction with 2-sized wire; a 6x16, known as cable construction, and 6x7 haulage rope.

The ropes most frequently employed are of the 6x7 and 6x19 construction, or to more fully express the foregoing designation, a rope composed of 6 strands of 7 wires each about a hemp center or 6 strands of 19 wires each about a like center. The 6x19 construction is modified as to disposition of the metal in several ways. The first and earliest type of construction was that in which all of the 19 wires in one strand were of one size, but for most purposes what is known as the 3-sized wire 6x19 rope is preferable, as considerably more metal can be used per given diameter, thereby increasing the strength of the rope and its ability to withstand abrasive wear.

The 6x19 Seale patent construction is one in which all the outer wires of each strand are considerably larger than the inner wires. It is designed exclusively for work where abrasion must be considered the factor of greatest importance. A 6x16 construction is sometimes employed where the 6x19 3-sized wire construction does not quite meet the requirements as regards abrasive wear and where the 6x19 Seale patent type is considered unadapted.

The type frequently employed in the coal regions is known as a 6x19 standard hoisting construction. Each strand is composed of 19 wires—the 7 inner wires of one size, while the 12 outer wires are of two different sizes. Such a construction gives the greatest area of material that it is possible to obtain and at the same time secures a more flexible rope.

It is good practice when once a construction which is giving satisfactory service is secured to stick to it. On slopes and planes a limited variation as to construction is possible. For instance, where there is heavy friction and abrasive wear constructions with larger outer wires might be tried out with good results, provided of course that the drums and other conditions are suitable for such a change; for increasing the size of wire in a certain diameter of rope tends to stiffen it.

For certain uses, such as shaft sinking where a wire rope is used to hoist an unguided bucket, it is highly advantageous that this bucket should not rotate or spin, thus endangering the lives of the shaft-sinkers. To avoid such rotation, a special lay nonspinning rope has been built. This is illustrated in Fig. 4.

A nonspinning wire rope consists of 18 strands of 7 wires each in two layers. The inner layer is composed of 6 strands laid up in left-hand lang-lay about a hemp center. The outer 12 strands are regular right-hand lay. The inner and outer portions of a rope thus constructed oppose each other in their tendency to twist or untwist, with the result that the rope as a whole is inert and evinces no inclination to rotate when an end is hanging free. A nonspinning rope may therefore be used with convenience and safety for operating a bucket in shaft-sinking or for other purposes where a tendency to spin would be undesirable.

Three Properties Are Desirable

The three properties desired in a wire rope are strength, toughness and flexibility. These should exist in well-balanced proportion. The rope must have such strength that it will sustain the load with a reasonable factor of safety; it must have such flexibility as will reduce the bending stresses to a practical minimum; the wires must be of such size as to safely withstand a reasonable reduction in area due to abrasive wear; while they must be tough in order to resist to the very last degree the tendency to crystallize or become brittle, either from severe or repeated bending or from vibrations due to rapid operation. No one of these properties can be developed to the maximum without causing a serious reduction in the value of the others. For instance: The greater the strength of the wires the less will be their toughness and pliability; the greater the flexibility of a certain construction the less its ability to withstand abrasion.

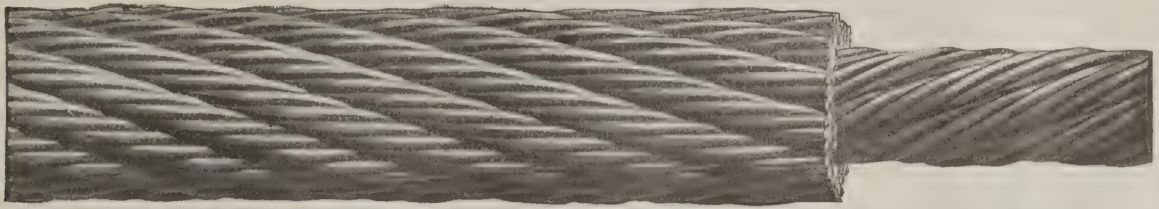


FIG. 4. A NONSPINNING ROPE. A FREE END OF THIS ROPE HAS NO TENDENCY TO REVOLVE OR SPIN

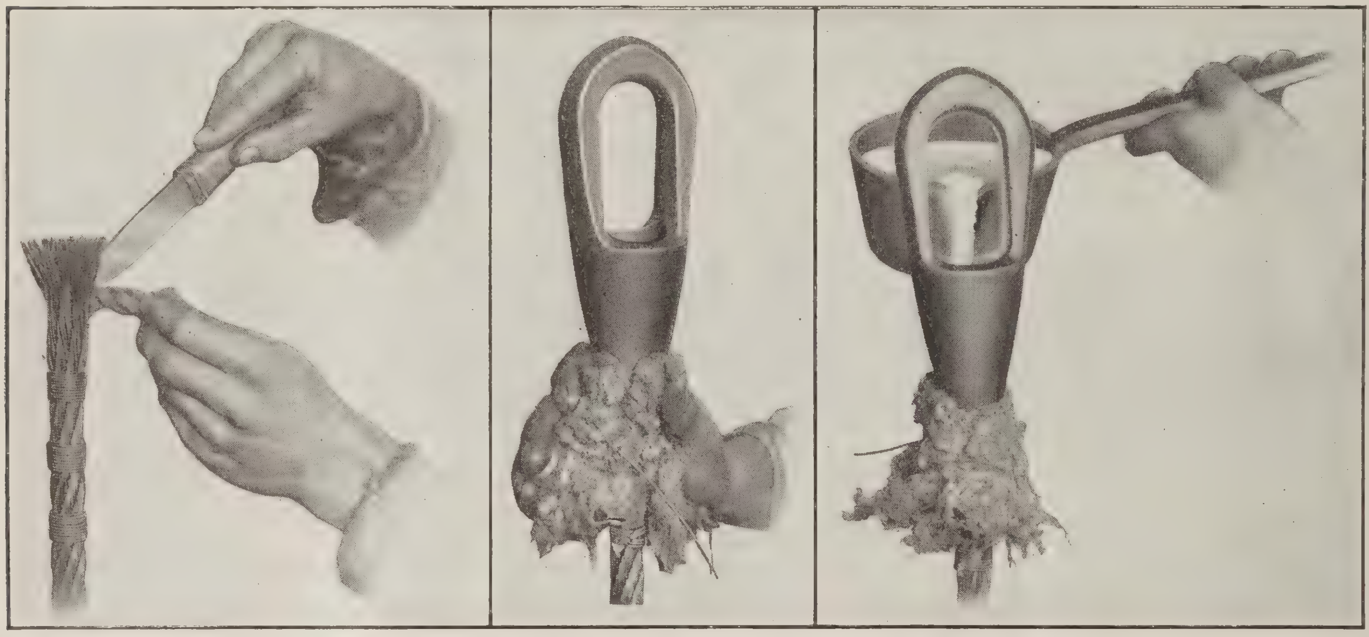
In each and every application of wire rope a careful study must be made to determine which of the before-mentioned factors is of the most importance. The grade and construction of rope which will most nearly fill the existing requirements can then be readily determined.

Many installations of rope-using equipment include sheaves and drums which were provided without thought as to how they would influence the life of the rope. In some instances these conditions are the result of ignorance; in others they arise from a lack of space or power, or the cost of both. Sheaves and drums of generous proportions invariably tend to lengthen the life of the rope.

Some users of wire rope insist upon buying a size and grade which do not insure a sufficient margin of safety. The result is that the rope is continually overstressed, and any sudden overload is apt to produce broken wires or strands, or may even rupture the rope itself. If the machinery will not permit of the use of the proper size of rope, then a grade of increased strength must be resorted to, care being taken to see that such a change—as for instance, from crucible to plow steel—can be made without unduly increasing the tendency of the comparatively stiffer wires to crystallize in service.

Sometimes cases are found where too large a size of rope, both from a standpoint of necessary strength and a limiting size of scoring on sheaves and drums, is used. When a man uses too large a rope he does so principally through ignorance of the essential features of good rope practice or because in his desire to favor the rope from a standpoint of tensile stress he inordinately increases that due to bending. The result is that he nearly always pays more, initially as well as ultimately, for his rope than he would if he had secured the proper size for his purpose.

Ropes should never be unwound by laying the coil or reel flat on the ground and pulling off a single coil at a time. This process puts a certain amount of tension or torsion in every convolution, and consequently the rope will show a greatly increased tendency to twist and kink if dragged or suspended with a free end. If a kink is once pulled into a rope it can never be removed. Furthermore it greatly weakens the rope at that place. Trouble because of improper unwinding is exceedingly hard to locate, although it is encountered quite frequently.



FIGS. 5, 6 AND 7. SHOWING THE THREE STEPS OF SOCKETING A WIRE ROPE

It is necessary in using wire rope to have the proper amount of space between the lead sheave and the drum in order to avoid too sharp an angle. The angle between the line from the center of the sheave to the center of the drum and that from the center of the sheave to the outer side of the drum should not exceed 1½ deg.

Proper Factor of Safety

In all rope calculations it is necessary that the rope under consideration shall have a factor of safety of from 5 to 7. It is customary to calculate the proper working load by dividing the breaking strength of the rope by the safety factor desired and then subtracting from the quotient obtained the net bending stress expressed in tons. A safety factor is just what its name implies, and incidentally it serves partially to provide for the certain loss in strength due to reduction in the size of the wires that have become worn in service. For ordinary work a factor of safety of 5 is sufficient, although if human life is to be dependent upon the safety of the rope, a factor not less than 7 and sometimes as much as 10 may well be employed. There is no practical justification for exceeding these figures.

As the name implies, the bending strain is the strain produced in the wire when the rope is bent around a drum or sheave. The stress is that force which produces the strain. Generally speaking, for ropes 1 in. in diameter and over, it is best to use sheaves and drums of such size that the bending stress will not be more than $^1/_{20}$ of the ultimate strength of the rope. For smaller ropes, an allowable bending stress of from $^1/_{10}$ to $^1/_{15}$ may be considered—preferably the latter.

Since the size of sheaves and drums is generally fixed, we must determine what construction will most nearly bring the bending stress within the desired limit, taking into consideration at the same time the question as to whether or not that construction will stand the combined forces of bending and abrasion better than one in which the bending stress will be relatively greater.

Reverse bending cannot be too strongly condemned. There are a limited number of cases where this reverse bending cannot be avoided, and in such instances the rope has to be sacrificed, but knowing the bad effects resulting from such reverse bending, it is desired to sound a note of warning that should be heeded by all.

The subject of bending stresses is a very abstruse one, on which two authorities rarely agree.

Sudden stresses caused from quickly starting or accelerating the load—that is, those due to inertia—should be minimized, as they increase the tension on the rope beyond all power of calculation. A fairly heavy package can be carried by a light string or cord if the latter is humored, but if the cord is subjected to a sudden stress such as a jerk it will very likely break.

Some operators hoist too heavy loads with their ropes, and some have such high-powered machinery that if the load becomes wedged or meets with an obstruction, the engine power is sufficient to break the rope.

All ropes which operate over sheaves and drums suffer a reduction in area due to abrasion, but very often a slight change in the layout of equipment can be made which will materially reduce this destructive factor. Wire ropes should wind on a drum having a smooth, well-scored or grooved surface, and in the case of haulage ropes, should be prevented from coming in contact with anything which would tend to retard their passage or add to the abrasive wear. Well-turned idlers or rollers should be placed at frequent intervals along the track, to prevent the rope from dragging over the ground ties and rails.

Overwinding Increases Abrasion

Overwinding of a wire rope on a drum greatly increases the wear on the former, especially if the rope is allowed to wind and overwind unevenly. Other evils, the direct result of uneven overwinding, are jamming and mashing of the rope.

All sheaves should be in perfect alignment in order that the rope will not wear unduly in any particular plane. The lead sheave—or in other words, the one over which the rope passes after leaving the drum—should be located far enough away from the latter to permit the rope to wind freely and evenly on the drum. If the space between the lead sheave and drum is too short or if the lead sheave is not in line with the center of the drum, increased abrasive wear will result.

If a wire rope is operated over a sheave or drum which is not properly scored or grooved for the size of the rope, the latter will flatten under the pull of the load. Such flattening tends to rapidly destroy the rope. Drums and sheaves of the proper scoring support the rope at the point where the crushing stress would otherwise produce this flattening.

When ropes are operated where they are subjected to the corrosive action of the elements, the need for proper lubrication and protection from moisture and from acids is doubly great. Sometimes a complaint of poor service is based on the actual tonnage hoisted or the amount of material removed, when it will be developed that the plant using the rope has lain idle for several weeks or months. In such a case, unless the rope is well cared for, corrosion will so weaken it that it will fail almost immediately after resumption of service.

The term crystallization is used to denote the effect produced in wires by continued operation, repeated bending over small sheaves or drums and whipping or vibration of the rope. The place in a rope where crystallization will most likely occur is where it is attached to some rigid object, such as a socket. It is therefore recognized as good practice to resocket all ropes at intervals dependent upon local conditions. What is commonly known as crystallization is in reality nothing more than fatigue of the metal.

Ultimate Failure is Inevitable

The failure or wearing out of a rope is as natural and inevitable as that death must follow life. Doctors can retard human dissolution, and the rope user should know what constitutes good or bad treatment of a rope in order to secure the best of working conditions for his cables and thus prolong their usefulness.

There are several ways of splicing wire ropes, although all of them are identical so far as the fundamental operations are concerned. A well-made splice will often develop the full strength of the rope and be invisible to the eye of even the experienced. The length of rope necessary to make a running splice will vary according to the size of the rope. For instance, at least 16 extra feet should be used for making a splice in a ½-in. diameter rope whereas a 1½-in. diameter rope would require approximately 40 ft.

Proper Socketing Is Highly Important

A socket well attached to a wire rope will more nearly develop the full strength of the latter than any other known type of attachment, as a uniform tension can be secured on each wire of each strand. This is always the factor of greatest importance. Most of the complaints due to breakages at the point of socketing can be traced to carelessness on the part of those who did the work.

The most approved method of applying sockets is as follows: The end of the rope to be socketed should have at least two tightly wrapped servings of soft wire, the last one being at a point about equal to where the rope will enter the basket of the socket. The strands should be opened up, the hemp core cut out, and the wires thoroughly cleaned. Grease may be removed by immersing the wires in gasoline, after which they should be dipped in a dilute solution of muriatic acid (HCl) and then plunged into boiling water containing a small amount of soda, which tends to neutralize the effect of the acid.

The wires may now be inserted into the basket of the socket, care being taken that the socket is in perfect alignment with the axis of the rope. The base of the socket should now be sealed with putty or clay, and spelter (pig zinc) should be slowly poured into the basket of the socket until the latter is filled.

To produce the best results the spelter must not be too hot nor too cold. A simple way to determine the desired temperature is to plunge a soft pine stick into the metal and quickly withdraw it. If the stick is charred, the spelter is too hot; if the spelter adheres to the stick, it is too cold for pouring.

If socketing is done in cold weather the socket should be heated enough to prevent the spelter from solidifying suddenly when brought in contact with its cold surface. Spelter which is too hot has a tendency to anneal the wires of a rope, especially if they be of fairly small size.

Importance of Frequent Lubrication

A wire rope should be lubricated for the same reason that any machinery should—to minimize the friction of its working parts. The lubrication should be so carried out that the rope will be protected from corrosion as well. Most makers thoroughly lubricate not only the wires, but the strands of ropes, in the process of manufacture, and it is imperative that the user of rope keep up the good work.

The strands of a rope have a tendency to force the lubricant out of the center, and unless the user constantly applies some lubricant to the rope internal corrosion will take place even though the wires which are visible remain bright and uncorroded.

In view of the fact that the failure of a wire rope may cause loss of life, as well as damage to property, the importance of thorough internal lubrication cannot be overestimated.

No great help can be expected from the hemp center. While this may have been thoroughly saturated in the beginning, considerable lubricant is soon squeezed out, leaving the rope dependent upon outside lubrication.

The use of a compound which will run easily and drip from the rope, leaving it practically dry after a few days in the hot sun, is to be avoided. There are few if any operations where the ropes are greased every day, nor is there any real necessity for such a practice where a properly selected compound is employed. Consequently, a lubricant should have a certain staying power even at fairly high temperatures.

The fact that a grease is fairly heavy or thick does not necessarily indicate a good lubricant; on the contrary, many such compounds possess no lubricating value whatever. A rope in use is continually subjected not alone to the wear of the drums, sheaves or rollers, but to a constant wear inside, owing to the wires in the strands moving slightly upon each other. The edges of the strands are constantly touching and nicking when the rope bends.

A proper protective shield should form a cover, protecting not only the outside, but also the inside of the rope or cable. It should not form a hollow shell capable of retaining moisture, nor should it harden quickly and flake off. Such a shield should be absolutely impervious to moisture and should remain plastic for a considerable length of time. It should, when applied, be able to penetrate sufficiently to reach the inside wires and to make a homogeneous coating.

* *

Successful Shoveling Machine

By Edward H. Coxe*

SYNOPSIS—This machine, which is built in three standard sizes, shovels the coal from the mine floor and loads it into the mine car. Slight changes in construction adapt the machine to loading coke or other material from stock pile or yard.

The accompanying illustrations show the shoveling machine manufactured by the Myers-Whaley Co., of Knoxville, Tenn. This machine has been on the market for about five years and is the invention of William Whaley, a member of the firm, and is covered by patents issued to him.

Mr. Whaley began working on the design of this apparatus in the early part of 1907, and the first complete machine was put into operation in the spring of 1908 in the mine of the Windrock Coal & Coke Co., working in a coal bed 4½ ft. thick. Here the machine was operated for several months.

This first machine when working with an ample supply of loose coal in front of it loaded at the rate of 1 ton per min., the daily output ranging from 50 to 100 tons, according to the car supply. Adequate facilities were not provided to keep the machine steadily at work, and its use was finally discontinued.

At the present time the machine is built in three standard sizes, as follows: No. 2 type is designed to work in a space as low as 47 in. from the top of the rail to the roof. The principal dimensions are: Weight, about 9000 lb. when in working order; track gage, 18 in. and over; length, 19 to 21 ft., depending on the length of the car employed; width over all, 4 ft. 9 in.; wheelbase, 33½ in.; reach, 7 ft. 9 in. on either side of the center of the track; maximum height over all, 46 in., or more if desired; width of shovel, 27 in.; power consumption, about 7½ hp., a 10-hp. motor being provided; maximum capacity, 30 cu.ft. per min. in loose material.

No. 3 type is designed to work in 5 to 6 ft. of head room. The principal dimensions of this machine are: Weight, about 11,000 lb. in working order; track gage, 20 in. or over; length approximately 22 ft. 6 in., varying to suit car; width over all, 4 ft. 6 in.; height, 3 ft. 11 in.; wheelbase, 35 in.; reach, 8 ft. upon either side of the track center; width of shovel, 29 in.; power consumption, about 10 hp., a 15-hp. motor being provided; maximum capacity, 35 cu.ft. per min. in loose material.

No. 4 type is designed for mines or tunnels 6 ft. and over in height. The principal dimensions are: Weight, about 17,000 lb.; track gage, 24 in. or more; length, 22 to 26 ft., varied to suit car; width over all, 5 ft. 4½ in.; height, 4 ft. 6 in. and upward, depending on height of car; wheelbase, 42 in.; reach, 10 ft. either side of the track center; width of shovel, 34 in.; power consumption, about 12 hp., a 20-hp. motor being provided; capacity, 45 cu.ft. per min. in loose material.

Only One Motor Is Employed

The entire operation of the machine is accomplished by one motor mounted in the space beneath the rear inclined conveyor, the friction clutches and operating levers being all close together so that they may all be handled by one operator in one position.

The motion of the shovel closely resembles that of a man in shoveling. Figs. 1, 2 and 3 are views of a No. 2 type machine at work in a 54-in. coal bed and show different positions of the shovel proper. Fig. 1 shows it going under the coal. In Fig. 2 the shovel is partly up to the dumping position, while in Fig. 3 it is being discharged onto the conveyor. The largest type of machine has a platform mounted on the front swinging frame or jib with a seat for the operator.

The machine may be propelled backward or forward, and a clutch operated by a hand lever connects the conveyor drive and the shovel drive to the motor. This is provided with a spring set at a predetermined tension, so that should the mechanism of the conveyor or shovel encounter a greater load than it is intended to carry, the clutch slips, preventing breakage of the part. The front portion or jib frame of the machine is pivoted to the main frame and swings laterally 45 deg. on either side. This enables the No. 4 type of machine to shovel or to reach material over a total width of 20 ft. from one track.

The shovel proper consists of two parts, and is mounted on the end of the jib frame. The front is supported and driven by a crank rotating continuously in one direction. The sides of this front section extend backward to a cross-shaft having rollers on each end running in cam grooves. The rear, or inner, shovel is mounted on this cross-shaft. It fits between the sides of the front shovel and has ears projecting upward with cam rollers to engage other grooves for tilting the rear shovel.

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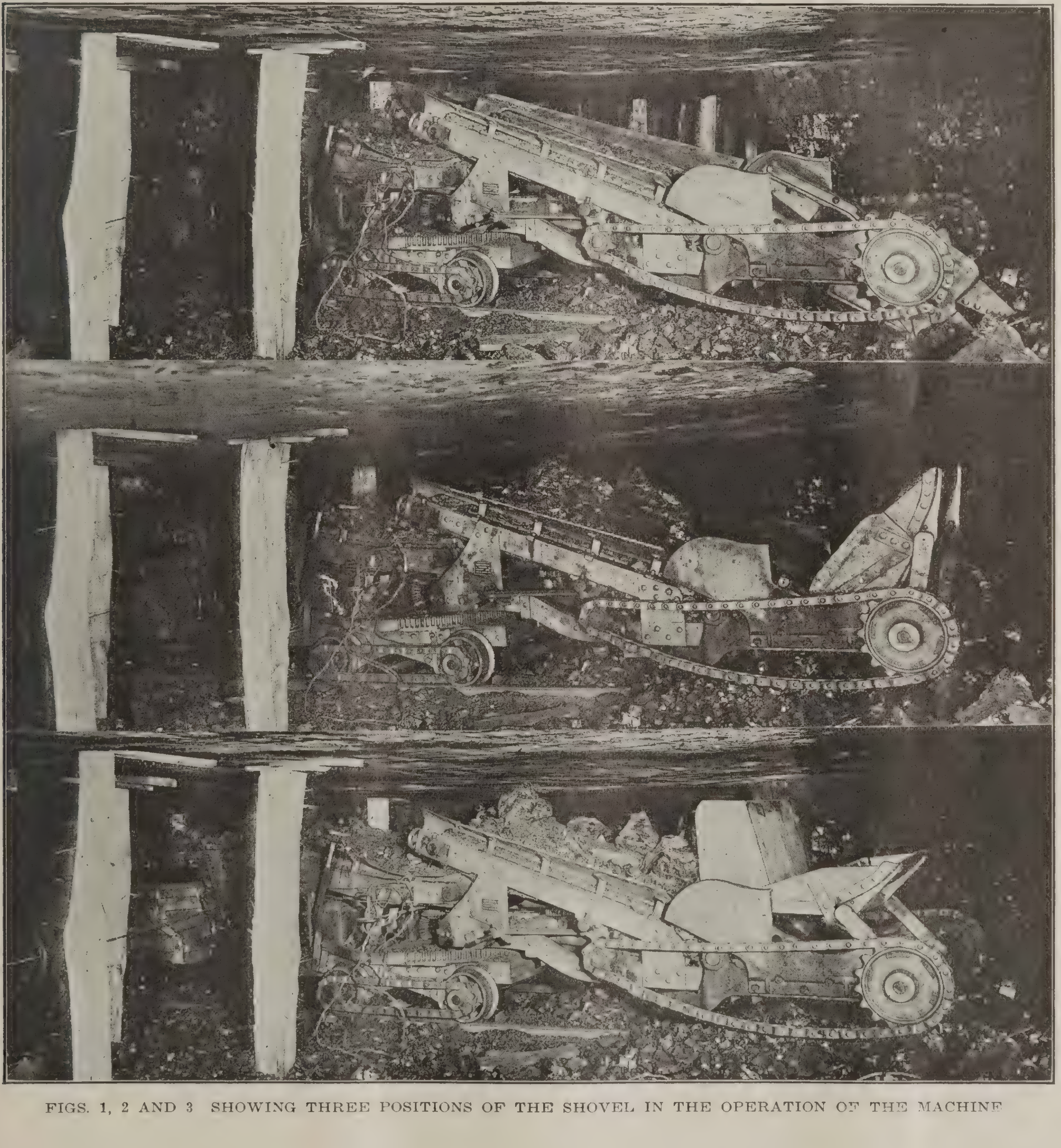
The shovel is thrust forward under the material to be handled, then rises up through it, passes backward and opens, discharging the coal onto the inclined conveyor, which swings on the jib. The action of the shovel is continuous and automatic. The only task the operator has to perform is to direct the shovel to the material and start and stop the machine as cars are loaded or places are cleaned up. The inclined conveyor on the jib delivers the material to a second conveyor, which is pivoted at the same point as the jib and which may be swung laterally for loading on either side of the machine or on a curve. This conveyor carries the material backward and delivers it into the car. It will handle lumps or pieces as large as can be delivered by the shovel.

Owing to the efficient shoveling motion, the power consumption is comparatively small, electric meter readings in tunnel work showing that the No. 4 machine consumes approximately $^{22}/_{100}$ kw.-hr. per ton of material handled. The shovel proper on this size of machine weighs about 1000 lb. and is operated at a speed of 13 to 14 strokes per min. It will handle approximately 4 cu.ft. of material per stroke.

The main frame of the machine is a single piece of steel casting, which in the No. 4 size weighs 2200 lb., while in this size of machine there is all told about 8000 lb. of steel casting. The rest of the machine is mostly structural steel shapes and forgings, with a few cast-iron parts.

The transmission gears are all cut and most of them hardened. The bearings as a general rule are of white bronze. The sprockets are all of steel with cut teeth, the



FIGS. 1, 2 AND 3 SHOWING THREE POSITIONS OF THE SHOVEL IN THE OPERATION OF THE MACHINE smaller ones being case-hardened. The drive chains are all of nickel steel of the automobile type of roller chain.

This shoveling machine may be operated by electricity, compressed air, steam or gasoline, and it is adaptable for underground mining in any class of material, tunnel work, open-cut work or loading to or from a stock pile. Certain minor changes may be introduced to suit the material being handled; thus for loading coke the head of the conveyor may be fitted with a screen for removing the dust and breeze before discharging it into the car. In the design for this latter class of work the whole machine may be made to revolve through a circle, the main frame being mounted upon a turntable on the truck, which has a wheelbase of 6 ft.

Machines of this type are now in successful operation in tunnels, in rock, salt, lead ore and limestone mines, in copper-ore pits and in limestone and gypsum stock piles, as well as in coal mines, these being scattered over the states of New York, Pennsylvania, Indiana, Illinois, Missouri and Montana, and also in Spain and South Africa.

The principal problem in the use of the machine is that of transportation or car supply, which in the case of coal mines has not yet been very well taken care of. Coal operators are slow to adopt new ideas or to depart from old and established customs. It is believed, however, that a considerable saving may be made, not only in the reduction in cost of loading itself, but in maintenance and because a given tonnage may be secured from a small area.

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Flag Raising at Exeter Colliery

At the Exeter colliery of the Lehigh Valley Coal Co., a flag was raised on Saturday, July 3, to celebrate Independence Day. As Sunday was the Fourth of July, it was necessary to shift the day either ahead or behind, and July 3 was chosen.

The Westmoreland and Henry collieries decorated the company's offices, and the men of Exeter colliery, with the assistance of the Lehigh Valley Coal Co., furnished a fine entertainment for a big crowd. A large flag measuring 10x18 ft. had been purchased by the employees, and a flagstaff 70 ft. high from which to fly it was provided by the company. The flagstaff is near the site of the Battle of Wyoming, where on July 3, 1778, the tories and Indians, in unholy league, defeated the American militiamen.

The Lehigh Valley Coal Co. also supplied benches and erected a large tent for the convenience of the audience. W. D. Owens, division superintendent of the Lehigh Valley Coal Co., was chairman. The invocation was delivered by Father Quinnian, of St. Cecilia's Church, Exeter Borough. Prof. Brierly, of West Pittston, delivered the principal address, making the flag his theme. Mrs. C. S. Crane, regent of the Dial Rock chapter of the Daughters of the American Revolution, gave the obligation, and Conrad Wildoner, of the Grand Army of the Republic, made the response. Songs were sung by the school children and others under the direction of D. W. Phillips, their voices being accompanied by the Exeter band. The benediction was delivered by Rev. J. A. James.

The women and children were given ice cream and cake, and all present received a book entitled "My Flag" and a small reproduction of that emblem. Such flag raisings are becoming increasingly frequent and give an excellent opportunity for impressing on every one the ideals of freedom, order and fairness on which the republic rests.

FREE IN NATIONALIZATION AS IN CITIZENSHIP

But such flag raisings of late have been generally accompanied with efforts to urge naturalization on foreigners. It is doubtful whether we desire citizens who need any urging. Perhaps we should be as proud as a certain secret society which forbids a canvass for membership. Many associations have learned to their cost that they have only been weakened by such members as were secured by dint of excessive solicitation. We want our citizens to come freely to a free country.

PART OF THE CROWD AT THE FLAG RAISING AT EXETER COLLIERY OF THE LEHIGH VALLEY COAL CO.

VETERANS OF THE GRAND ARMY, WITH COMPANY OFFICIALS

Mrs. C. S. Crane is in the center. The company officers are W. D. Owens, A. H. Browning, R. A. Mulhall, George Miller, J. C. Williams, C. C. Brierly, Richard Culter, David Owens and David Richards. The G. A. R. men include Comrades Shoemaker, Wolf, Nagle, Wildoner, Fetts and Durland

OFFICIALS, OLD EMPLOYEES AND BOY SCOUTS AT THE FLAG RAISING TO CELEBRATE INDEPENDENCE DAY

Our problem is not much different from that of Russia in Poland; Germany in Alsace-Lorraine and East Prussia; Austria in Galicia and Transylvania; England in French Canada, the Transvaal and Egypt. The more we press our language, our ways and nationalities on foreigners the more they resist. We shall and do succeed, despite the difficulties, only by following, like some other nations, the broad and unerring road of tolerance. The work of nationalization proceeds the faster because those we would assimilate came here with a predisposition to believe this country a land of freedom and of large opportunity. We of all people have the least need to force the process of digestion.

But we must not be surprised if foreigners, even from the Balkan states, are not at first enamored of our civilization or anxious for a place as citizens. It is not any more surprising than the fact that the fellaheen of Egypt have but little affection for British rule.

Americanization Not To Be Imposed, but Embraced

But we need not despair. Granting these aliens fellowship and fair treatment, they will not be foreigners long. "Good wine needs no bush," and our American freedom, tolerance and good nature need no advertisement.

But the flinging of the flag to the breeze is the confession of our faith in those ideals on which the nation is founded and of our intention that those purposes of our government shall be perpetuated by our people. The binding force of such teachings will knit together our communities and do much to prevent those unfortunate manifestations of violence and ill-will that have awakened us too often to the fact that all are not Americans who are domiciled in America.

It is for these reasons that flag raisings such as that at Exeter are to be commended. By such exercises our people consecrate themselves to the service of the nation, and it is a pity that in other places this worthy national movement is being mixed with a proselytizing propaganda which cannot effect its purpose.

Don't Blow Into a Cap

It is common practice for miners to blow into fulminate caps when making up primers, in order to blow out any dust, dirt or sawdust which may be therein. This is a bad practice, as the moisture from the breath or small globules of saliva may dampen the end of the powder train in the fuse when it is inserted and cause a cutoff or even a misfire. Neither should the cap be rapped on anything hard to loosen and shake out any dirt. If proper care is taken of the caps they will not need any such cleaning.—*Engineering and Mining Journal.*

Coal Trade's Need of National Co-operation*

By Charles F. Kerchner†

No industry is more in need of coöperation than the coal trade, and the coal trade at this time is more in need of intelligent coöperation than ever before in its history. Why?

Because one definition of coöperation in an industry is given as the equitable distribution of profits among those who earn them, which means that coöperation should insure that there be some profits for distribution. Also because during the past twelve months, owing to the great industrial depression and the adverse business conditions attributed primarily to the European War, no branch of the coal industry acknowledges having received a normal or equitable profit.

The war in Europe seems to have brought on price wars among the trade in many sections of the country. I am considering the subject from the standpoint of the mine operator, the coal carrier, the selling agent or jobber and the retailer of coal, and perhaps the consumer as well. When we think of the vast and varied interests covered by this list, the tremendous work of supplying the fuel needs of this country, and as now seems imminent the requirements of many foreign markets that may depend upon us, the subject seems appalling and much too important to be dealt with except very briefly.

When we consider that the coal areas of the United States are limited, it is evident that in view of our broadening markets, foreign and domestic, we should conserve our coal wealth against crude, wasteful and antiquated merchandising methods. This latter means that every branch of the trade should be safeguarded against cut-throat competition and unfair business practices; that a general and continuous effort be made all along the line to bring about a more even demand and distribution so that periods of great shortage in markets are not followed later by overstocked bins at ruinous prices.

Reducing Number of Sizes

The anthracite companies have been considering during the past year the question of reducing the number of sizes now prepared and sold by them. A decrease in the number of sizes, if it could be managed without disturbing present markets or lessening the demand by the introduction of competing substitutes, would be to the advantage of the mining companies and of some advantage to the retail distributor. I cite this simply as an instance where working together might help solve an important problem.

The necessity of coöperation in the coal trade must have been recognized early in its history. This is evidenced by the many exchanges, associations, clubs and organizations of all kinds that have been projected in the past, also by the many local and state organizations that flourish at the present time. A great number of those are largely composed of retailers and are intended to safeguard the interests principally of the retail distributors of coal. About this time of the year our trade papers devote considerable space to convention proceedings of these associations.

In some of our city coal exchanges the members in utter violation of fundamental business principles are engaged in price-cutting campaigns that must mean serious money loss and sacrifice of capital and credit. These spasmodic outbreaks, usually started by one kicking member, often apparently unsettle or annul the effect of several years of patient organization. Why have these irregular and unsatisfactory conditions prevailed? What is the answer?

Is it a fact, as one writer observed, "that men cannot coöperate successfully for any purpose if the sole bond between them is one of self-interest?" Are we hampered too much by tradition and precedent? Isn't it about time that a manly effort be made to bring these various interests of this great industry together in one strong national organization that will be always and everywhere truly representative; that will be mutually beneficial and protective; that will carry the educational work into every city, town and village in our land; that might be competent to voice the sentiments of the trade as a body on any national or state legislative question that directly or indirectly affects the interests of the trade; that no question would be too large or too complex for the organization to handle while leaving strictly local matters to the state or other local associations?

Is there need in the trade now for such an organization, and isn't this the psychological moment to project it? Your presence here indicates that you believe in the value of organized effort. If so how shall we bring this national association into being? Organize here with charter members, adopt bylaws and begin a recruiting campaign? Or shall we make use of Kokoal, adopting its many valuable features, principal among them being its social and fraternal ideas? If the latter are joined with some serious object that would appeal to the material interest of the various branches of the trade, we will have an ideal organization that will command the universal support and respect of our trade members.

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*Address delivered before the Order Kokoal, Auditorium Hotel, Chicago, Ill., July 13, 1915.

†Hall Bros. & Co., Baltimore, Md.

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Coke Demand from Italy

According to advices received by the Chamber of Commerce of the United States from Charles F. Hauss, president of the American Chamber of Commerce in Milan, there is an opportunity because of war conditions for the United States to acquire coke and iron business in Italy. The demand for this metallurgical foundry coke and pig iron appears to be urgent.

Mr. Hauss informs the national chamber that war between Italy and Germany has stopped entirely the arrival of foundry coke and low-grade pig iron from Germany. The local producers, which are the Solvay process works at Vado and Savona near Genoa, are closed because they have no coal, and until the war is over very little coal and coke will come from England, from which Italy has been importing about 70,000 tons of coke per year. The imports from Germany, Austria and Belgium amounted to 220,000 tons of coke per year.

"If the present feeling can be depended upon," Mr. Hauss informs the national chamber, "Italy will probably never purchase from Germany again, or if she does, it will be after a long time, so that America never had a better opportunity to get and hold the coke and iron business in Italy. We therefore cabled that there is a great demand for metallurgical foundry coke and pig iron and requested that you wire prices."

Mr. Hauss suggests to prospective senders that the date should be given at which sailing can be had. The unloading and handling charges to put the goods on cars at Genoa or Savona would be about 50c. a ton, and the freight from these ports to Milan is just under $2 a ton. The port of Savona has special facilities for unloading coal and coke, so that this would be the best port to which to ship.

The metallurgical or hard foundry coke, which has come from Westfalia in the past, was delivered in Milan at from $11 to $12 a ton, and at the present those who have any coke in stock are getting anywhere from $20 upward a ton.

The committee on transportation of the Milan chamber is studying the matter of finding return cargoes for American steamers and has in view besides the colored and Carrara marble, zinc and lead hematite, and iron ore from the island of Sardinia. There is naturally the usual higher grade freight for alimentary products as well as wine, cheese and silk. Such an arrangement would tend to reduce the freight rates and at the same time build up a substantial business between the United States and Italy.

Furthermore the financial committee of the Milan chamber is at work on an arrangement between the banks in Italy and in the United States which would advance money on bills of lading, thus avoiding the disagreeable demand for payment in advance.

European Financial Interests in South America

That Great Britain's financial interests in South America have been of material assistance in smoothing the way for her export coal trade has been generally accepted. It is not, however, as widely known by what scale these interests are measured.

At the end of 1912 it was estimated that Great Britain had £724,623,743 invested in South America. While the German figures are not available, there is no doubt their tremendous increase in shipments from 13⅓ million tons in 1903 to 43½ million tons in 1913 was due in a measure to the same reason. The course for America to pursue is plain.

Decrease in Anthracite Shipments

Shipments of anthracite during the first half of this year were 1,350,485 tons less than those during the first six months of 1914. Shipments last month were 814,084 tons less than those of June a year ago. The figures for June were 5,316,102 tons this year and 6,130,186 tons in 1914, and the total figures for the six months were 31,595,304 tons this year as against 32,945,789 tons in 1914. The amount of coal on hand at tidewater shipping ports decreased 11,888 tons, from 751,617 tons on May 31 to 739,729 tons on June 30.

The Lehigh Valley led in tonnage for the month with 988,253, the Lackawanna was second with 888,399 and the Philadelphia & Reading was third with 852,411. The Delaware & Hudson carried 697,894 tons, the Erie 693,089 tons, the Jersey Central 609,127 tons, the Pennsylvania 446,690 tons and the New York, Ontario & Western 140,239 tons.

Extracts from a Superintendent's Diary

Today a moving-picture film-producing company came into camp and took temporary possession of everything in sight—men, women, children, mules, scenery, equipment and all. For some time we have had one or more idle days in each week, and I decided last Monday when the manager of the film company came for an interview that no reasonable objection could be raised against turning over the mine to his company on the next idle day, so today's adventures were the result.

We staged a mine fire, an explosion and a strike in rapid succession, and if circumstances had not interfered, would have enacted a murder trial in which four striking miners were to have received death sentences, largely because some of their companions had insisted on telling what they knew when put on the stand to testify.

We were supposed to furnish only the scenery and the mob—the camera, the scenario, the stars and the director being provided for in advance; but as a matter of fact we inspired so many changes in the scenario that its author wont be able to recognize it when he sees the film; and as for the stars, the star of the entire performance was Sim Hicks, organizer and leader of the last strike at our camp, while Sadie McDonald, his sweetheart, earned favorable mention to say the least.

The strike as conceived by the author of the scenario was minutely described and could have been enacted down to the smallest detail, but his kind of a strike never has existed anywhere outside of the minds of some people who, like the author of the scenario, receive their impressions from newspapers or novels; and Sim Hicks, standing back with the "supers" as the instructions were being read, felt called upon to go up to the director and tell him how the thing ought to go.

Fortunately the leading man of the company realized that Sim knew whereof he spoke, and a few moments later he also realized that Sim could take the lead; and what was more to the point, he had Sim leading before Sim realized just what was up.

Another thing that Sim accomplished without realizing it, was the clearing up for some of us of many mysteries connected with our last strike, so completely did he become wrapped up in the spirit of the drama.

Sadie McDonald was assigned a minor part, which as it happened proved most fortunate for the success of the picture, because Sadie also became wrapped up in the drama; but her infatuation was not with the spirit of the drama, but with the worldly spirits by which it was being enacted.

The realistic manner in which the two actresses who were supposed to be rivals for Sim's love caressed him every time they had half a chance was too much for Sadie; and in the last scene, when Sim is supposed to make a choice and advanced with open arms to receive the lucky fair one, Sadie lost control of her emotions and would have spoiled the entire film had it not been for the presence of mind of the director, who managed to make Sadie's unexpected advent into the center of action appear as if she were really part of the program, being none other than a third rival for the hand of our handsome strike leader.

All in all, before the film was finished Sim, Sadie and all of us had a day of it that we will not soon forget.

Middle Western Anthracite Market Dull

Efforts to stimulate anthracite orders are still being made in the Middle West, but it is doubtful if a reduction of $1 per ton would result in increased buying. Anthracite shippers on the Upper-Lake docks still have considerable empty space in their yards; but the independent shippers, not having storage facilities, have been cutting prices to move their current output, while the dealers complain that they cannot accept the volume of shipments of other years because of the meager demand for storage coal this summer. They are working on a hand-to-mouth basis until return of cold weather, when they expect an extraordinary activity.

At points in Illinois, Iowa and Nebraska current shipments have been made at discounts of from 35c. to 50c., which are the lowest prices for a number of years past. July is usually considered a dull anthracite month in the West.

Situation at Upper-Lake Docks

The movement of coal off Lake docks has been unusually slow this season. Receipts up to June 10 as compared with those up to June 1, 1914, were: Soft coal, 1,065,000 tons, against 1,308,000; hard coal, 344,000 tons, against 130,500.

More hard coal has been shipped this year than last season, while the tonnage of soft coal shipped to the head of the Lakes is considerably less than last year. Approximately the docks had in stock Apr. 1 this year 3,275,000 tons of soft coal and 482,000 tons of hard coal. This, with the shipments of the present season, shows coal on docks to be 4,340,000 tons of soft coal and 1,826,000 tons of hard coal, or a total of 6,166,000 tons, less the shipments moved since Apr. 1, which are smaller than ever before.

Most of the tonnage carried over was what may be termed for railroad use, and as a result of the bountiful crops in prospect the railroads undoubtedly will requisition heavily on supplies from the docks in the near future. Normally they consume 3,500,000 tons of dock coal. The dock companies have always figured on the trade taking a reasonable amount of its requirements during spring and the early summer months, but for two years the trade has waited until the coal was actually needed, which has added to the complications of the dock situation.

Annual Meet of American Mine Safety Association

By authority of the executive committee the annual meeting of the American Mine Safety Association for election of officers and transaction of business will be held in Birmingham, Ala., Sept. 2, 3 and 4, 1915. There will be the usual joint interstate miners' field meet, and the Bureau of Mines, the Alabama Safety Association and the American Red Cross will act in conjunction in promoting this event, which will be known as the Third Annual Southern States Miners' Field Meet.

Headquarters will be at the Hilman Hotel, and the sessions of the association, beginning at 1 p.m., Sept. 2, will be held in the rooms of the Chamber of Commerce. The executive committee is notified to meet at this place at 10 a.m., Sept. 2. Chairmen of all committees are requested to prepare and submit their annual reports and their recommendations regarding changes in standards or practices.

The largest possible attendance is urged, both because of the importance of the business to come before the association and the fact that the field meet will result in the selection of a team to represent the Southern States at the National Miners' Contest, San Francisco, Sept. 23 and 24.

Fuel Used by New York Gas and Electric Companies

The gas and electric companies operating in New York City consumed 2,684,839 tons of coal and coke during 1914, according to reports filed with the Public Service Commission. Of this total the gas companies used 1,579,122 tons of coal and coke, and the electric companies used 87,548 tons of anthracite and 1,018,169 tons of bituminous. The reports also show that three of the gas companies made 533,474 tons of coke and sold 271,539 tons.

The tonnages used by the various companies are given in the accompanying tables.

COAL CONSUMED BY ELECTRIC COMPANIES IN 1914 (TONS)

	Anthracite	Bituminous
New York Edison Co.	8,066	686,973
United Electric Co.	......	113,027
New York & Queens Electric & Power Co.	23,816	8,220
Flatbush Gas Co.	15,012	1,605
Edison Illuminating Co. of Brooklyn	37,971	168,778
Bowery Bay Electric Light & Power Co.	1,635	......
Queens Borough Gas & Electric Co.	......	12,705
Richmond Light & R.R. Co	1,048	26,861
	87,548	1,018,169

COAL CONSUMED BY GAS COMPANIES IN 1914 (TONS)

	Boiler	Retorts	Generator	Carbonized
Consolidated Gas Co.	13,402[1] 16,904[2]	5,345[2]	49,935[1] 41,003[2]	78,560[4]
New Amsterdam Gas Co.	16,697[3]		64,813[3]	
New York Mutual Gas Co.	2,991		36,960	
New York & Queens Gas Co.	2,144		4,788	
Astoria Light, Heat & Power Co.	42,032	66,527[2]	87,565[2]	577,170[4]
Standard Gas Light Co.	11,402[3]		35,782[3]	
Central Union Gas Co.	14,446[3]	10,565	30,892[3]	112,525[5]
Brooklyn Borough Gas Co.	2,540		6,499	
Kings County Lighting Co.	5,573		16,505	
Brooklyn Union Gas Co.	48,476		239,772	
Bronx Gas & Electric Co.	12,361		3,629	
Queens Borough Gas & Electric Co.	2,803		5,308	
New York & Richmond Gas Co.	3,177	2,497[1] 507[2]	7,028	
Total	194,948	85,441	530,479	768,254

[1] Coal. [2] Coke. [3] Coal and Coke. [4] Boilers. [5] Retorts.

COKE STATISTICS FOR 1914 (TONS)

	Made	Used	Sold	Amount Received
Consolidated Gas Co.	54,779		39,215	$138,864.90
Astoria L., H. & P. Co.	403,344	201,296	206,037	644,141.53
Central Union Gas Co.	75,351	49,224	26,287	116,775.66
	533,474	250,520	271,539	$899,782.09

Exposition Prizes Awarded

The preliminary list of awards by the Panama-Pacific International Exposition gives the Department of the Interior's collective exhibit one grand prize. The exhibit of the Geological Survey receives one grand prize, four medals of honor, five gold medals, six silver and two bronze medals. The Bureau of Mines receives one grand prize, six medals of honor, three gold medals and three silver medals.

Bunkering at San Francisco

The only large bunker contract in San Francisco is the Pacific Mail Steamship Co.'s contract, filled by the Western Fuel Co. All regular steamship lines that touch San Francisco, if engaged in the coastwise trade, burn oil; those in the ocean trade that burn coal usually touch at Puget Sound or Vancouver Island and bunker there. At the end of 1914 there was brisk bunkering on account of tramp steamers arriving in San Francisco to take grain cargoes to England. The price for bunkering coal is around $6.75 to $7.25 f.o.b. vessel, for mine-run coal. The coal is loaded from wooden hulks or barges fitted with special machinery for bunkering vessels, and they are brought alongside the vessel for that purpose.

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Economy of Motor Trucks for Delivering Coal

By J. F. Flood*

In the fall of 1912 the Youghiogheny Coal Co., of Pittsburgh, Penn., purchased two 6-ton Peerless trucks and commenced operating them. These gave such complete satisfaction that they bought two 5-ton trucks on Oct. 7, 1913. The depreciation charges against these trucks, plus net earnings, equal an amount, as of Dec. 31, 1914, that is $3200.81 in excess of their cost, all expenses of operation, plus depreciation, being charged to the trucks. The company has figures to show what it costs per ton to haul coal by means of horses, the coal delivered by trucks being charged at the same rate as team delivery. The fact that the depreciation charges, plus net earnings, exceed the cost of trucks by more than $3000 is conclusive proof that their investment in trucks has been a profitable one.

Two of the trucks used by this company are of 5-ton capacity, but the average load in 1914 was 6.005 tons. During that year each of these trucks averaged a total actual running time of 320 days of 10 hr. each, exclusive of the time it took the trucks to run from the garage to the yard and return.

These four trucks have covered more than 80,000 miles, carrying heavy loads up many of the steep grades of Pittsburgh and have never been stalled for want of power.

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*General manager, Youghiogheny Coal Co., Pittsburgh, Penn.

Recent Legal Decisions

Missouri's Mine Ventilation Law—The statutory duty of Missouri coal operators to provide suitable ventilation for miners at work does not prevent an operator from devolving the duty of cutting openings upon miners whose skill and experience qualify them to do the work. And an operator is not liable for injury to a miner resulting from poisonous gases and lack of opening between two rooms if the injury followed the miner's disobedience of an order given him by his foreman to make an opening. (Kansas City Court of Appeals, Perry vs. Northwestern Coal & Mining Co., 175 Southwestern Reporter 140.)

Delivery of Coal on Private Tracks—Where carload shipments of coal were consigned for delivery to the consignee on his private switch track leading to his coal-sheds, the delivering railway company was not entitled to payment of the freight charges nor could demurrage charges accrue until the cars were placed on that track. Putting the cars on public delivery tracks at the point of destination and notifying the consignee of their arrival was insufficient tender of delivery. (Massachusetts Supreme Judicial Court, New York, New Haven & Hartford R.R. Co. vs. Porter, 108 Northeastern Reporter 499.)

Royalties and Forfeitures Under Coal Leases—When a coal lease provides for mining various sizes of coal at differing royalties and for payment of minimum royalties, but fails to provide what proportion of small sizes shall constitute the minimum quantity to be mined annually by the lessee, it will be enforced according to any practical construction that may be for a long time mutually adopted by the parties. A clause authorizing the lessor to declare a forfeiture of the lease on the lessee's failure for more than 90 days to pay royalties after they have become due will not justify a forfeiture for delay in paying a small amount if the lessee's liability for that amount was reasonably in doubt during the period of the delay in payment. (Pennsylvania Supreme Court, Lehigh Valley R. Co. vs. Searle and Stark Heirs, 94 Atlantic Reporter, 74.)

Ballads of a Coal Miner--III

By Berton Braley

Today when we gets through
My pardner says, says he,
"Come on, let's hist a few—
The drinks'll be on me."
But I says, "Thank you, bo,
I'm on the water cart,
I'll have to answer, No,
Right here an' at the start.

"This time, of course, *you'd* buy
But next wud be *my* turn
An' drinks comes much too high
Fer me, with what I earn.
Besides, frum what I've seen,
Booze treats you mighty rough,
An' I ain't very keen
To monkey with the stuff.

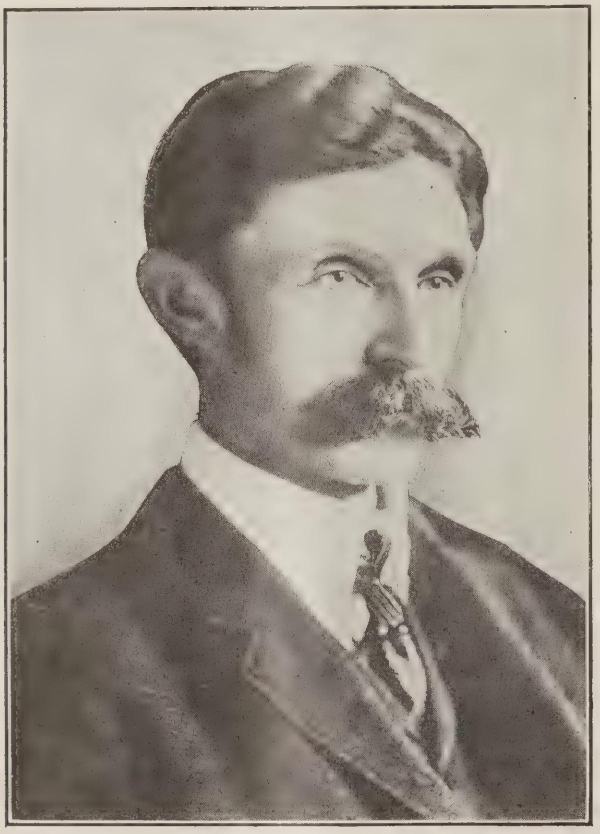
"I've seen guys blow their kale,
Get drunk an' row an' fight,
I've seen 'em land in jail
Or sleep on floors all night,
I've seen 'em come on shift
All shaky-like an' gray,
An' so—you get my drift—
I think it doesn't pay.

"There's chance enough to take
When I'm in sober trim,
Without no booze to make
My senses dull an' dim.
I guess I'll blow my chink
For grub an' clothes an' shoes;
Some guys prefer to drink,
But I'll keep off the booze!"

The Death of Doctor Holmes

Word has been received that Dr. Joseph A. Holmes, director of the United States Bureau of Mines, died in Denver, Colo., on July 12. For a number of months Doctor Holmes' strength has been gradually failing him. All his efforts to regain his health through changes of climate and by securing the best of medical advice were unavailing.

It is the belief of many of the friends of Doctor Holmes that his untimely end was hastened by the unusual efforts and the long hours he devoted to the establishment and operation of the Federal mining bureau. Doctor Holmes was the first director of this comparatively new mining department of the Government, and it is to him principally that credit must be given for the excellent organization that has been established.



JOSEPH AUSTIN HOLMES

Coal Age has already published a short sketch of the life of Doctor Holmes, but a few words at the present moment are of interest.

He was educated at Cornell University, graduating from that institution in 1880. After leaving college his attention was largely devoted to geology, chemistry and mining. He visited mining regions in this and many foreign countries, examining both metal mines and coal operations. From 1881 to 1891 he served as professor of geology in the University of North Carolina. From 1891 to 1903 he acted as state geologist for North Carolina. In 1903-4 he organized and had charge of the Department of Mines and Metallurgy at the World's Fair, St. Louis.

His first real work for the Government commenced in 1904, when he was placed in charge of important fuel tests then being conducted. In 1905 the director of the United States Geological Survey enlarged the scope of Doctor Holmes' work, so that his investigations covered mine explosions and other important phases of general mining work. From 1905 to 1910 this mining work was carried on by Doctor Holmes under the direct supervision of the Geological Survey. It was in 1910 that the new mining bureau was first established, with Doctor Holmes as its first head.

Joseph A. Holmes was a member of the American Institute of Mining Engineers, the Mining and Metallurgical Society of America and a number of other similar organizations. He was possessed of one predominant quality—tact—which served him well in the difficult task he undertook of popularizing the new Federal mining bureau among the coal- and metal-mining fraternity of America. Many men believed that the Government had neither reason nor right to enter actively into the business of mining, even on a coöperative and nonproductive basis, and it became the duty of Doctor Holmes to satisfy these men that the Bureau of Mines was organized solely as an advisory department and not as a bureau of interference and dictation.

The national recognition that has been accorded this branch of the Government service constitutes the greatest compliment that the mining industry of America can contribute to the memory of a man all have loved for his common virtues and respected for his work as an organizer and engineer.

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New Safety Precautions

The Susquehanna Coal Co. has just completed examining its mine foremen, assistant mine foremen, fire bosses and safety inspectors in the anthracite-mine law. Many of these men have been in the employ of the company for long periods and passed their state examinations many years ago. The management of the company wanted to make sure that they were conversant with the mine law as it is today, and the results have been most gratifying.

The series of examinations was started in all five divisions of the Susquehanna Coal Co. last fall. Certain pages of mine law were assigned as the subject-matter for each examination, and the employees who occupy the responsible positions were given three months to prepare for the first test. In a division that reported recently, only three men scored less than 100 per cent.

The examinations are given by the division superintendents and are written. They are modeled upon a system of periodic examination such as is conducted in schools of like nature. The examinations are held on days when the colliery is idle, or at night, and the entire mine law germane to their duties is covered in the series. Such a series of systematic tests can be carried out by any company, large or small. The interest and study shown by the employees have proved highly satisfactory to both officials and men.

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As Pressure Increases with Depth in mining, so will the tendency to lessen the proportion of large coal. This is clearly recognized, and the way in which it may be moderated is by laying out the workings in the manner most suitable for the cleavages, also by the method of undercutting and packing and by avoiding downhill faces in seams with much dip. It is further held to be especially desirable to work at a uniform rate with just sufficient pressure to help in bringing down the coal. Stopping the workings for a time is known to be detrimental.

The Labor Situation

SYNOPSIS—It is possible that there will be no anthracite strike next spring. A Pennsylvania court refuses to grant an injunction against the union. The condition of labor in Ohio is desperate and little bettered by the ending of the strike. Miners strike in the eastern Kentucky field for a restoration of the former wage scale. The Bache-Denman Coal Co. learns that it cannot get damages for mines destroyed. In Colorado attempt is being made to remove Lawson's judge.

On June 8 the canvass of the United Mine Workers of America for new members started in the anthracite region, with President John P. White as principal spokesman. In his speeches he urged the strengthening of the union in order that an 8-hr. day might be established and the union recognized. These are apparently to be the main aims of the anthracite workers in the coming struggle. If these ends alone are sought, the strike is quite likely to meet public approval and to end in complete success.

The 8-hr. day may not be strongly opposed by the operators; for it is probable that the day workers, who are the only persons really concerned, can easily increase their efficiency so much that in the shorter day a larger output may be produced. It is impossible to disguise the fact that in the anthracite region there has been some "slacking," as our English cousins call it. Even with shorter hours a larger stint of work could be performed; for in one state, Illinois, where the 8-hr. day obtains nearly five times as much coal is handled by the outside force as in the anthracite region. This is shown to be true when making the calculation, even when we exclude in favor of the anthracite region all the slate pickers in that field.

Very cleverly Mr. White at Scranton said: "Let us be consistent; when we demand that the operators recognize our union, let us recognize it ourselves and join it." This pronouncement is the keynote of the canvass.

A Rumor That Some Operators Favor the Check-Off

There is a rumor started that some of the companies are willing to grant the check-off and full recognition of the union. Of course, this is spread to bring the men into line, but it has probably some basis in truth. Certain of the larger companies do appear to be favorable to some means of preventing button strikes and think the check-off a cure, because the man who desires to quit paying has to declare his intention openly, whereas now he can simply be slack.

The 10-per cent. increase demanded will not be obtained in practice by the daymen if the hours are shortened more than the wage is increased, which is what they desire and demand. Consequently it is likely that the increase will be granted, the men promising to make up the shortness of the working day by greater diligence when at work.

The daymen failing to get an increase in day wage and having their working hours reduced only to that which is already customary with contract miners—who often work even less—the contract miners may be well content to waive their demand for increased pay. If they want a higher return they can readily increase their output of coal. So considering everything, it seems likely at present that the much-heralded anthracite strike may end in a love feast.

The mine managers and operators in the anthracite region are in a class by themselves. If perhaps a somewhat un-American degree of aloofness characterizes them, there is also a marked tendency toward paternalism or socialism, whichever one may choose to term it; and if the miners enter into their schemes, it is quite likely that the latter will find the operators ready to make an arrangement which will benefit the workingmen in many ways. In fact there is a large amount of fine idealism in the anthracite operator upon which the coal miner can well work to the mutual advantage of both.

Perhaps the conciliation board will be removed and replaced by boards like those already established elsewhere. They have not brought peace any more than the anthracite conciliation board, but they are probably as successful in doing so as the board now in control in the anthracite region will ever be. The miners always will, it is to be presumed, prefer to strike than to arbitrate, and they will find a way, like the operators, to avoid the fines proposed. The miner always terms the strike a "holiday" and the operator explains a lockout as a "shortage of orders" or of railroad cars.

Some New Decisions of the Conciliation Board

The conciliation board has decided that the employees of the Bear Valley colliery of the Philadelphia & Reading Coal & Iron Co. are entitled to yardage pay when cutting pillar-hole headings where foremen or assistants order the work done. The pillar-hole headings are what in the bituminous regions would be termed rib crosscuts.

The Harwood Coal Co. dispute was not decided as the board was unable under the evidence to determine what the former practices have been, and the mine committee and the officials of the company have been instructed to meet and ascertain the conditions under which certain rates were formerly paid.

The Clinton colliery workers declared to the board that the Delaware & Hudson Co. had discharged certain pillar men out of spite and not, as claimed, solely to reduce the force employed. This grievance was withdrawn on the reinstatement of the men.

The engineers and pumpmen of the Valley Coal Co. and Coxe Brothers & Co. desired the board to decide against the practice of those companies, which was alleged to be to lay off the regular engineers and pumpmen when times were dull and replace them with assistant mine foremen and firebosses. This matter was referred to the umpire for adjustment, as was also the case of the Tunnel Ridge colliery against the Philadelphia & Reading Coal & Iron Co.

Two other grievances were withdrawn. Thus of 8 disputes 2 were decided for the miners, 2 were withdrawn, 3 were referred to the umpire and 1 was returned to the company and men for further consideration.

Charles P. Neill, of New York, formerly United States Commissioner of Labor, has been named by Judge Joseph P. Buffington of the Third Federal Judicial District Court as umpire to adjust the 20 grievances from the anthracite coal mines in which the conciliation board is unable to agree.

"Thin-Vein" Coal Is Coal North of a Given Line

In the Pittsburgh region the Washington County Court has refused to enjoin the officers of District No. 5 of the United Mine Workers of America from inducing the members of the union to cease work for the Youghiogheny-Pittsburgh Coal Co. The ground of the petition filed by that company was set forth at length in this department of "Coal Age" in the issue of June 19. The court decided that the plaintiff clearly failed to show satisfactory evidence that it was entitled under the 1914 wage scale to employ miners at the rate which it had been paying them. Hence the plaintiff's bill for an injunction against the union officers was dismissed at the cost of the plaintiff.

The company held that the imaginary boundary line between the thick and thin veins of coal known as the "Cedar Creek, Lock No. 4 and Waynesburg and Washington railroad" line was not in contemplation by the parties when they used the words "thin vein" and "thick vein." The court held that if some other division than that named in a previous agreement was contemplated, then as the agreement is made in reference to all the mines in the district, it is void everywhere because of its uncertainty. Consequently an inquiry would have to be made for each individual mine to determine whether wages should be paid on the "thin-vein" or "thick-vein" scale. Further, the court was unable to determine from the evidence before it the exact number of feet of coal required to bring the mine under classification as "thick vein" within the meaning of the persons who executed the scale agreement of 1914.

Sunday Creek Co. Shuts Down More Mines in Ohio

In the Hocking district of Ohio, John H. Winder, general manager of the Sunday Creek Co., announced that the two San Toy mines, located on the Baltimore & Ohio R.R., were closed down indefinitely July 6. Now that these are shut down the Sunday Creek Co. is only operating three mines in Ohio, and they are on the Toledo & Ohio Central R.R. Just how long they will continue working is a matter of conjecture, but it is believed it will not be long unless the demand for Ohio coal greatly improves.

All in all, the coal-mining situation in the Buckeye State is in bad shape. Only about 33⅓ per cent. of normal output from all of the fields of the state is reported, and the percentage is gradually growing smaller.

Vigorous steps are being taken by Ohio operators to right these conditions. One of these has been to form a strong operators' association to include all fields of the Buckeye State. In former years the operators in Ohio have not been organized, and they have not been able to show a united front. Another step is to endeavor to secure relief from the discriminatory freight rates. Since the General Assembly refused to take action last winter a movement has been started to induce the Ohio Utilities Commission to lower intrastate rates. The commission has the authority, as is shown by the decision of the Ohio Supreme Court in the case of the New York Coal Co. against the Hocking Valley Ry. Co. As a result of this suit the freight rate from Nelsonville to Toledo was reduced from $1 to 85c.

Hocking Valley operators and miners are both urging Governor Willis to come to the rescue of the coal trade in Ohio. Both sides now appear to be united on that matter. It is understood that the Utilities Commission is favorably inclined toward the reduction of Ohio freight rates on the zone basis. But as one of the commissioners expressed it, "What is to prevent the railroads from reducing their rates from West Virginia and Kentucky to lake ports and from renewing in that way their discrimination against the Ohio operators?"

It is pointed out that when the railroad companies were interested in Ohio mining there was not as much discrimination in rates as at present. Lately the railroads have become interested in the development of the West Virginia coal fields, and the rates have been reduced from the fields of West Virginia and Kentucky to such a point as to make it impossible for Ohio operators to compete.

It is argued that coal is shipped from West Virginia, Tennessee, Kentucky and even portions of Virginia to lake ports for 2 mills per ton per mile. Ohio operators would be perfectly satisfied with a rate twice as large and could then compete with the producers in the states named.

So far, the officials of the Ohio miners' organization have not answered the communication of John H. Winder, of the Sunday Creek Co., in which he requested the same working conditions that were granted the operators in eastern Ohio. The Sunday Creek Co. has devised a plan of weighing coal under the antiscreen act, which tends to make the miners produce a clean product. The coal is screened over the regulation 1¼-in. screen, picking tables are provided and all dirty coal is thrown out. All the coal is then weighed together, free from the dirt.

A Paper Mining Scale That Helps No One

The new scale is hardly the cause for the closing down of the Hocking Valley mines, for it is if anything more favorable to the operator than the old. Nor is the shutdown due to the greater advantage gained by the Belmont County operators in their escape from unfavorable deadwork allowances, for Belmont County is also running slack where the mines are not still idle. The trouble is in the general business depression in Ohio and elsewhere and in the competition resulting from a more extensive reduction in the wage scale elsewhere. The result is also a climax of conditions which have been growing from year to year and which were inevitable though well-disguised by the relative prosperity of 1913.

The situation in eastern Ohio is quite desperate. There are 5000 men idle, and though there are resumptions at some places, they are far less frequent than was anticipated when the long strike came to an end. And in Perry County, in the Crooksville field, the conditions are very bad. The Tropic Mining Co., through George M. Jones, its president, has addressed a letter to its employees opening thus:

> Has it ever occurred to you that it is possible to have a paper mining scale—one that means a high rate of wages but no work, thereby destroying earning power? The present mining scale, together with the Green mine-run law, has destroyed the coal industry in Ohio. In June, 1913, our Tropic mine, located at Tropic, Perry County, Ohio, worked 21½ days, and the payroll was $19,642.55. In June, 1914, our mine was idle as the wage scale was not adjusted. In the month just passed, owing to the mining scale being too high to enable us to compete with other districts, we could not operate, and the payroll was $457.05. The difference in payrolls, as shown, represents the loss to our employees, as West Virginia and Kentucky coal was used to supply our trade.

Petition will not be made for a referendum on the Gallagher bill. The United Mine Workers of America has decided not to circulate it as the cost would be too great, the need for it is but little and the funds of the union are at a low ebb.

A Strike for Restoration of Old Scale in Eastern Kentucky

On July 1 the miners employed by the Continental Coal Corporation, operating large mines in the Straight Creek field of Kentucky near Pineville, struck. On July 6 the miners employed by the Trosper Coal Co. in the Brush Creek field, near Trosper, Ky., and those employed by the New Bell Jellico Coal Co., near Four Mile, in the Greasy Creek field, went on strike. About 1500 men are involved in the three fields.

About three months ago, owing to the depressed condition of the coal market, the men were asked to take a reduction in wages and were told that as soon as conditions became such that the companies could afford it they would have the old rates restored. The men thought that this restoration should date from July 1, and for that reason walked out. The mines in eastern Kentucky are working from one-third to one-half time on a restricted output, and the demand is the smallest known for this season of the year.

The reduction of wages in nonunion fields in times of depression is a standing invitation for an invasion of the union because by such means the market is taken away from union mines and the men deprived of the percentage they were enjoying. Such an invasion, with the union as weakened as it is now, is not likely to take place at present. But it is always well to maintain rates in bad times and let the nonunion mines take their medicine with the others. But having consented to a reduction in wage rates in March when the winter business still continued, it seems the height of folly for the miners to look for a rise in rates in July—the dullest part of the year.

To Whom Must We Look for Redress if Tipples Are Burned?

The suit for $1,250,000 brought by the Bache-Denman Coal Co. against more than 200 officers and members of the United Mine Workers of America was dismissed by the United States District Court on July 6. This suit, it will be remembered, was for damages incurred by the plaintiff during a strike at its mines. On July 17, 1914, three mines were destroyed; on the 18th, another mine was burned, and on the 20th, a fifth was maliciously fired. Federal troops were called out and peace was restored; and the company, driven into bankruptcy, brought suit against its tormentors. The court now declares it has no jurisdiction. It is a distressing case of a failure of justice. Someone should be made to pay for the flagrant use of firearms and the torch.

Further Developments in the Case of John R. Lawson

Meetings are being held everywhere to obtain liberty for John R. Lawson, the executive board member of the U. M. W. of A., found guilty of murder. Meantime legal steps are being taken to disposses the judge, Granby Hillyer, who condemned both Lawson and Zancanelli. Application was made to the Supreme Court of Colorado through the miners' attorneys, A. M. Belcher, of West Virginia, and H. N. Hawkins, of Denver, Colo., and an alternative writ of prohibition was awarded against the judge.

On July 12 argument was begun on the motion to prohibit Judge Hillyer from participating further in the trial of the so-called strike cases. He is alleged to be in sympathy with the Colorado Fuel & Iron Co. and to have been formerly an attorney for that corporation.

On the same day Judge Hillyer refused to give J. R. Lawson another trial. F. W. Clark, representing Lawson, was given 60 days in which to file a bill of exceptions and a 30-day stay of execution. The counsel desired the court to order that the prisoner be released on bond till the Supreme Court gave its decision, but this the court refused to do. A juror, Grover Hall, has sworn that he was induced to decide against the defendant by undue conduct on the part of a court bailiff.

James H. Brewster, who investigated the strike conditions for the state and testified before the Federal Industrial Relations Commission at Washington, has not been reappointed at the University of Colorado. He has been a bitter partison of the miners' interest. He has written a letter to his former associates at the University of Michigan declaring that he has been ousted for his political action.

COMING MEETINGS

The Southern Appalachian Coal Operators' Association will hold its semiannual meeting July 23, 1915, at Knoxville, Tenn. J. T. McCoy, Knoxville, Tenn., secretary.

The American Mine Safety Association will hold a meeting July 23-24, at Billings, Mont. H. M. Wilson, 40th and Butler St., Pittsburgh, Penn., secretary.

The United First-Aid Corps of the 4th district, Delaware, Lackawanna & Western R.R. Co.'s coal department, will hold its third annual first-aid contest at Harveys Lake, Penn., on Aug. 14, 1915. Lewis Richards, 212 East Green St., Nanticoke, Penn., secretary.

The Somerset County Miners' First-Aid Meet will be held at Boswell, Penn., Sept. 4. The head of the local committee is F. W. Cunningham, Somerset, Penn.

The American Mining Congress will hold its 18th annual session at the Exposition Memorial Auditorium, San Francisco, Calif., Sept. 20-22, 1915. J. F. Callbreath, Majestic Bldg., Denver, Colo., secretary.

Editorials

The Trend of Conditions on New Contracts

In New England the important purchasers during the past month were the Bay State Street Ry., the New Haven R.R. and the International Paper Co. Of the 155,000 tons on which the Bay State Street Ry. (No. 802, Vol. 7, pp. 1005, 1085, 1128) invited bids, 95,000 tons, it is understood, was awarded to the Consolidation Coal Co. on Jenner coal (Somerset County, Pennsylvania) for delivery to the line points Quincy, Lynn and Chelsea, Mass., and Newport and Portsmouth, R.I., and 61,000 tons to the New England Coal & Coke Co. on New River for delivery at Beverly and at Mystic Wharf, Boston.

It is nothing new for this company to draw a share of its fuel from Pennsylvania districts, but the fact that the proportion awarded this year is so large is fresh evidence of the active competition on the part of shippers of Pennsylvania grades in this market. Somerset County coal had the preference among three grades, low-volatile being required on account of smoke laws in certain of the places.

As was generally predicted, the 250,000-ton order of the New Haven R.R. (Vol. 7, p. 1088) for engine fuel at different points and, through the Connecticut Co., another of 150,000 tons were both given to the New England Coal & Coke Co. So far as reported, the invitations did not get to shippers generally, and it is only a matter of conjecture what quality and price were embodied in the successful bid.

The 80,000 tons or so of the International Paper Co. (No. 236, Vol. 7, p. 1083) is for delivery at Portland to be railed inland, and it is reported that this order has been closed as usual with New River shippers at a price about on a level with a year ago. The Penobscot Chemical Fiber Co., taking about 30,000 tons at Bangor, has awarded its contract to the Spring Coal Co., Boston, also on a basis about the same as in 1914. These two orders disclose a determination on the part of West Virginia factors to hold their tonnage for the same figures as in other years.

The National Soldiers' Home, Randolph, Me., contract (No. 699, Vol. 7, pp. 877, 1087) shows the trend of low prices even on small business, particularly bituminous, the Gorman-Leonard Coal Co. having been the successful bidder at $3.69 alongside, 30 miles or so up the Kennebec River.

Most of the contracts awarded so far this year by the various New York City departments have been at lower prices than in 1914. An instance of this is obtained from the bids on the Board of Education contract calling for 84,160 gross tons of anthracite coal and 4700 gross tons of semi-bituminous coal (No. 674, Vol. 7, pp. 836, 976, and 956; Vol. 8, p. 78). The prices in Manhattan Borough were from 28 to 33c. per ton lower than in 1914. The total amount of coal used by the city departments in 1914 was 576,198 tons, and reductions in the price of the fuel used by all the many departments, if equal to those already secured, would reduce the coal bills nearly $150,000.

One of the public service corporations in Chicago is out of the market for screenings until Aug. 1, and its buyer frankly states that he expects to have things his own way. This concern being a large consumer of fine coal, its failure to make purchases at this time is having a depressing effect on the current prices of screenings. No doubt the increasing production of domestic sizes, particularly in southern Illinois, largely accounts for the decline in the prices of fine coal. The softening is somewhat premature and was not expected to materialize until the middle of August. The volume of consignment screenings, however, is small, and there is no disposition to forward fine coal from the mines without specific orders.

No improvement has developed in the volume of business handled over the lake routes. There is a congestion at the upper lake ports, but prices for lake delivery are well maintained despite the depression. More West Virginia coal is moving via the lakes to Northwestern points than Ohio tonnage, which is very slow in getting under way.

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Bunkering Supplies of the World

The United States Department of Commerce and Labor estimated that 75,000,000 tons of coal was consumed per annum for bunkering purposes, and it would seem that this estimate was too low as applied to 1913. The *Iron and Coal Trade Review* (London, England) made the same estimate in 1912. D. A. Thomas later estimated that about 60,000,000 tons of British coal was used as bunker fuel in the foreign trade. Adding 8,000,000 tons to this, covering the bunker coal from this country, leaves only 7,000,000 tons for the rest of the world.

Bunker coal supplied by other countries is about as follows: Germany, France and Holland 2,000,000 tons altogether; Austria and Natal about 2,000,000 tons each; India 1,000,000; Japan 3,000,000 tons. This brings the gross bunkering tonnage for the world up to 78,000,000. In addition to this a large part of the output of China and Chile is used for bunkering purposes, while New Zealand, Canada and Russia are also factors that must be considered.

It is interesting to note that there are about 300 more or less important steamship coaling ports in the various countries of the world. Great Britain has six ports alone that supply over 1,000,000 tons of coal per year for this trade.

British coals are used chiefly on the eastern Atlantic and East Coast of South America, but the more important West Indies stations use United States coal. Port Said, Suez and Aden use the British coal mostly. On the coast of India and Ceylon, which includes Karachi, Bombay, Colombo, Madras, Calcutta and Rangoon, coal from Natal, India and Sumatra supplies the bunkers.

At Singapore and along the coast of Burma, large amounts of Japanese and Indian coal are used, as well as Australian and some Welsh and Natal coal. The Australian stations of course use their own coal mostly, and the same applies to New Zealand. Japanese coal is an important competitor in the East Indies, as it is also further north in the Pacific, although considerable quantities of Chinese, Australian and Welsh coal are also found in these markets. A peculiar condition is that scarcely no United States coal is used for bunkering on the West Coast of South America, the supply coming almost entirely from Great Britain, Australia or Chile. Even along the North American Pacific Coast a great part of the bunkering coal is from Australia or British Columbia.

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Selecting Workmen and Machines

The problem of coal production is an intricate one. There was a time when the man who successfully operated a mine was, or at least was supposed to be, primarily a geologist. Times have changed, and today many coal producers with long records of success behind them may be unable to distinguish a Paleozoic from a Mesozoic formation. These men, however, know and know well how to handle the two factors upon which success or failure in mining chiefly depends. These factors are men and machines.

Leaders of men are born, not made. The ability to successfully direct the efforts of other people is as truly a natural gift as is music. While each may be trained and developed to a greater or less degree in different individuals the foundation of natural and inborn aptitude must be present in the beginning if marked success is to be attained.

The direction of human effort is a problem decidedly different from the selection and manipulation of machinery. The personal equation of each man—his temperament, inclination, likes and dislikes—varies decidedly from that of his neighbor. Nature does not deal in duplicates nor does she follow modern methods of manufacture so far as interchangeability is concerned.

On the other hand, man in his efforts at creation and invention aims almost invariably at "quantity production." Each separate part and individual element entering into a certain machine or mechanism is made, within certain well-defined and predetermined limitations, a duplicate of like parts or elements entering into the construction of the same or similar machines. Furthermore, the quality and size of parts are tested, tried and maintained by frequent analyses, physical tests and gagings, so that the quality and adaptability of the parts for the purpose in hand are at all times definitely known.

This care exercised in the manufacture of many of the articles employed in and about the coal mines is well exemplified in the description of the processes employed in the making of wire rope appearing on page 84. As a result of the constant care and strict supervision employed in its manufacture the maker of rope knows within an extremely small margin when his product leaves his mill what weight it will lift, what size of sheave it may pass around without excessive wear, and many other considerations of benefit to the user if he would secure the best service possible for the money he is about to invest.

Wire rope is only one of many mechanical devices indispensable to the operation of a modern coal mine. It may, however, be taken as a good example of mechanical apparatus, the failure of which may not only seriously disturb the equilibrium of the working organization, but may also endanger human life.

If a hoisting rope, for example, is not selected with due regard to the load it will be required to handle; if the sheaves over which it travels are not of the proper diameter; if the engine drum is too small or is improperly grooved, or if the rope is not adequately and periodically lubricated and treated with a suitable compound to shield it from the corrosive action of the elements and mine gases, the result will be inevitable, and only the time needed to accomplish the rope's failure will be uncertain.

Coal mining today is a dual proposition, success depending one-half on the efficiency and morale of the working force and one-half on the efficiency and reliability of the mechanical equipment and power supply. There is therefore quite as much room for the exercise of good mechanical engineering in the selection, care, maintenance and operation of the inanimate equipment as for so-called "human engineering" in the selection, organization and manipulation of the workmen employed.

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Market Abuses by Retailers

Coal shippers have been discussing recently a sales feature which is not entirely satisfactory from their standpoint. In a number of Western cities local dealers having retail yards not only sell coal in wagon-loads from their bins, but also do a jobbing business in carload shipments, and the wholesale shippers complain that they are competing with them on carload business.

On the other hand, the retailers are most insistent through the medium of their organizations, formed for their protection, that the operator and wholesaler shall ship coal only to regular members of these associations in good standing and shall protect the retailers from what they term the illegitimate sale of coal in carload lots direct to the consumer or to parties that have no yard facilities. This position on the part of retailers is acknowledged to be correct by the wholesalers.

The question has now been asked why the producers and wholesale shippers should not be protected against this form of competition on the part of retailers. It is felt that the sale of coal in carload lots to manufacturers and consumers who have sidetrack facilities and do not buy coal in wagon lots should be strictly confined to wholesale shippers, if the retail yards are to continue to have the protection that has been thrown around them in the past by the wholesalers.

The operators assert that it is a poor rule that does not work both ways, and several of them have expressed themselves forcibly to the effect that the practice of the retailers in selling coal in carload lots has had a most detrimental result in creating unnecessary competition and causing unwarranted price reductions. The wholesalers take the position that if they protect the retailers by not shipping direct to their customers the retailers should keep their hands off the carload business and give wholesalers and operators exclusive control of that trade.

Discussion By Readers

Value of Coal Analyses

Letter No. 3—I read with interest Mr. Coupland's reply to my inquiry on this subject, *Coal Age,* June 26, p. 1111. I find that while he agrees with me in some respects, he regards a few of my statements as "manifestly unfair."

The rate of $4 or even $6 named by Mr. Coupland for making a complete coal analysis is certainly reasonable; and I freely admit that, with this low rate, more coal consumers should analyze their coal, especially when they are using large quantities of fuel. The small consumer, however, could hardly afford to pay even this low price for an analysis of the product. My idea of the prices charged for this work was formed from my experience several years ago, when I assisted a prominent engineer who charged $25 for making such analyses. I wrongly assumed that the present price ranged around that figure.

However, I am still firm in the belief that coal-testing methods can be improved. As previously stated, I think it is only logical that the coal operator should test his shipments, which I am pleased to learn from Mr. Coupland's letter is being done by many uptodate mines today. I would ask, then, Why is it necessary that another test should be made by the purchaser of the shipments from such mines? It is customary for manufacturers of food products to advertise their goods as being 90, 95, or 99.5 per cent. pure, and the public buy these goods without questioning the truth of the claim. Occasionally such products are tested by the Government, and also, it may be, by some large buyers. Such a method is surely more satisfactory to all concerned than for the buyer to duplicate the work of the manufacturer, which would increase the cost to the consumer.

I can see no good reason why the mine operator should not be compelled to state the amount of moisture, volatile matter, carbon, ash, etc., contained in the coal of each shipment. The results of such an analysis could then be tacked onto each car shipped or on each barge loaded. Had this been done in the case of the 600-ton barge of coal mentioned by Mr. Coupland, there is no question in my mind but that the reported analysis would have shown the correct percentage of ash contained in the coal, and the sugar refinery would not have purchased that coal with this information before them. I do not believe that there would have been any attempt at deception, and I do not assume that there was any attempt on the part of the coal operator to deceive the purchaser of that coal. The coal did not meet their requirements and was rejected, but had this information been furnished with the bill of lading the loss of time and annoyance would have been avoided.

Under the present arrangement I do not blame mine operators for shipping coal without special regard in most cases for its quality, leaving that question largely to the purchasers to discover for themselves. As previously stated, I believe that there should be a change in this regard. A change would have an advantage in that small buyers would get just as good coal as is secured by the larger consumers who are able to test every shipment of coal. My contention is that a declaration of the fuel value of each shipment should be made by the coal operator. Such a declaration would certainly be fair to all parties, and would properly inform the consumer of the quality of his purchase.

N. G. NEAR.

New York City.

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The Purchase of Coal

Letter No. 1—I was interested and somewhat amused in reading the article entitled "The Purchase of Coal," *Coal Age,* May 8, p. 800, to note the many statements that, to say the least, are misleading.

At the beginning of the article, the author presents two questions which he admits "may seem odd," but which he claims bring forward "intensely practical answers." These questions are, "Why does the consumer purchase coal?" and, "How does the consumer purchase coal?" He answers the first question by stating that "coal is bought for heating purposes." This question is indeed odd and altogether unnecessary. The consumer purchases coal because he needs it and cannot get it without buying it in the market. Coal is not always bought for "heating purposes." It may be required for the manufacture of gas or coke or used in other industrial ways. I would suggest a more rational question would have been to ask, For what purpose does the consumer purchase coal?

In answer to the second question, I would say that coal is purchased either on a specification basis or at a fixed price per ton for a particular kind of coal. The author's reference to the purchaser of coal being "forced by current practice to buy tons of coal, regardless of the true value to him," and the statement that he is "paying for mere weight of coal," and his suggestion that, "there is more involved in the purchase (of coal) than mere tonnage," seem needless. As a fact, the consumer is not forced to buy his coal "regardless of the true value to him." He is always in a position to insist upon a certain heating value per ton.

Buying coal without specification does not necessarily mean that the purchaser is paying for mere weight of coal. If one buys Quemahoning coal from a reputable concern that mines and sells Quemahoning coal, he is reasonably sure to get that coal, with possibly some variation in heating value, but of a certain standard. If one buys Colver coal from the company mining that coal, he is certain to get nothing else; if one buys Castner, Curran and Bullitt New River coal, he is equally sure to get that coal. All of these coals have a certain minimum heating value, as the general consumer knows from experience. In other words, every large purchaser of coal knows about what results he should get from a given coal, and buying coal on its name, at a fixed price per ton, without any further guarantee as to its heating value, is not so much going it blind, as intimated by the writer of the article.

All locomotive fuel in this country and by far the greater part of the coal consumed in stationary plants and that for marine use are bought on the name and the reputation established as a result of many tests and long-continued use. There are other items that affect the purchase of coal besides its heating value. For railroad use, especially, the questions of transportation and certain financial considerations enter into the problem of the purchase of coal. It is not always the coal having the highest heating value that is the most economical fuel for a given plant; the price is an important factor, also the behavior of the coal in the furnace.

When it is possible to use successfully Illinois washed screenings, at $2.30 per ton, with a heating value of 12,200 B.t.u., the question may be asked, Would it be wise to buy New River coal at $3.30 per ton, having a heating value of 14,900 B.t.u.? Many steam plants have been purposely altered so that they could burn coal having a low heating value and thereby reduce the cost of operation. It is the cost of efficient operation that must finally control the selection and purchase of coal for fuel purposes. The problem is to secure the highest plant efficiency at the least outlay for fuel, and this involves the question of a suitable furnace.

The diagrams presented in the article to which I have referred as illustrating graphically "how one pound of coal may have great significance when all costs and efficiency in the plant are considered" are misleading, because they do not take into consideration the different varieties of coal and the difference in character and composition of the volatile matter.

The statement that "the content of fixed carbon and volatile matter is a measure of the productive cost" is not always true, assuming that by "productive cost" is meant the heating value of the coal per unit price. Coal, for the same percentage of combustible (fixed carbon and volatile matter), may have wholly different heat values. Thus, a coal having certain percentages of combustible and ash may have a lower heating value than one with a less percentage of combustible and more ash. As proof of this statement compare the following actual analyses of five different coals:

1. Combustible, 95.69%; ash, 4.31%; 14,272 B.t.u.
2. Combustible, 93.98%; ash, 6.12%; 14,841 B.t.u.
3. Combustible, 94.23%; ash, 5.77%; 14,283 B.t.u.
4. Combustible, 94.20%; ash, 5.80%; 14,820 B.t.u.
5. Combustible, 94.07%; ash, 5.93%; 14,549 B.t.u.

It is wrong to assume that the volatile matter of coal is wholly combustible and that the percentage of ash represents all the incombustible matter. The first two coals mentioned contain respectively 7.98 per cent. and 1.59 per cent. of oxygen, which being combined, is as nonproductive an element as the ash. This does not seem to have been considered in preparing these diagrams. The author admits that the first diagram represents "a purely hypothetical coal not found in nature"; but claims that the other four diagrams "are representative of coals on the market and show a common range of characteristics." I do not think that coals containing 24 and 32 per cent. of ash are at all representative or that their characteristics are at all common. I would like to ask if anyone can name a soft coal, offered on the market as steam coal, that would show so much ash. It is needless to state that diagram No. 2, representing a coal with 8 per cent. ash, shows better results than the three following diagrams where the ash runs 16, 24 and 32 per cent. respectively.

Again, the statement that "it is generally conceded that coal high in ash and sulphur is harder on all handling apparatus than a coal of lower ash and sulphur content," is not always true. For instance, a coal with 4 per cent. of ash that fused readily and made a soft, sticky clinker would certainly prove more injurious to the grate and furnace walls than a coal having 8 per cent. ash and a high fusing point, which would yield a light, porous clinker that is easily removed. It does not follow, either, that a coal with 1.5 per cent. sulphur would be more injurious than a coal with 0.75 per cent.

In fuel consumption, the heat available to the boilers and not the "evolution of heat in the furnace" is the controlling factor. Also, the evolution of heat in boiler furnaces will not always "vary directly with the heat content of the coal used."

Again, it must be remembered that a low consumption of a comparatively high-priced coal will often result in a higher cost of operation than a larger consumption of a cheaper coal. The coal best adapted to the conditions of the plant and load may not be the highest grade of coal, the purchase of which the writer of the article seems to advocate. For example, New River coal would not be the best adapted for use in a furnace designed to burn Illinois screenings, although the former is certainly a high grade of coal. Cost and adaptation are the vital factors in determining what coal should be used.

It may be possible to operate a plant with a high degree of efficiency when burning a coal of comparatively poor quality, provided it can be obtained at a low cost and meets the required conditions. The author does not state what he means by "daily tests" or "weekly averages," the results of which he suggests the consumer should send to his dealer, thinking thereby to place "both parties to the contract on an equitable footing." It is not clear what is intended by this suggestion.

In regard to the character of the tests to be made, if the coal is bought on a specification basis, the test will depend on such specifications. But when coal is bought otherwise, it is not necessary to determine the heat value for the same character or kind of coal, but only its ash content. For instance, if a Pocohontas coal is being used, any variation in ash will cause a corresponding variation in heat value, and a determination of the former is all that is required. Unless the coal is to be used for some special purpose, it is also unnecessary to determine the sulphur content. One important item that the author has failed to mention is the fusing point of the ash. In practice, high heat value will not be available if the coal clinkers badly. Sulphur is not a true measure of the liability of a coal to clinker, unless the nature and distribution of the sulphur compounds are known, and even then it would be somewhat of a guess.

At a well-managed steam plant, boiler tests are generally thought to be necessary. The determination of fixed carbon and volatile matter are practically unimportant, except when called for by specification or where there is a smoke ordinance in force. While the calorimeter test is simple enough in principle, the actual performance of the test is far from simple and requires much care and skill on the part of the attendant.

The article does not mention the important question of getting representative samples when testing a shipment of coal. The closing statement that "uniform fuel means uniform and economical operation" is untrue, since it is quite possible to have a uniform grade of coal and a high cost of operation, owing to poor firing or bad condition of furnace and other like causes of waste.

The subject of the purchase of coal is too large to be treated in a short article, and most general statements relating to methods and requirements are subject to modification in one way or another. The fact that so many complications enter into the purchase of coal on the market has led many large consumers to go back to the old way of buying coal by weight and reputation. It has also caused many coal operators to refuse to sell coal on analysis, except at a higher price. The United States Government, one of the largest consumers and one of the first to buy coal on an analysis basis, has made numerous changes in its specifications and has not yet reached an entirely satisfactory basis.

The American Society for Testing Materials has had a committee working on standard coal specifications since 1909. This committee was composed of representatives of the largest consumers and miners of coal, as well as prominent engineers. The committee has as yet been unable to make a final report owing to differences of opinion and practice. For this reason it is well to make only carefully guarded statements on this subject.

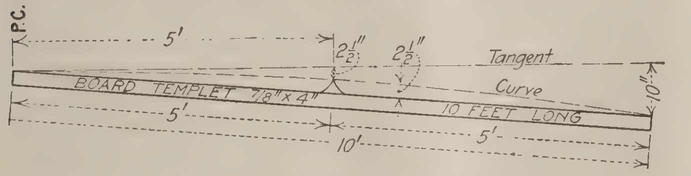
F. R. Wadleigh.

Philadelphia, Penn.

Laying in a Mine Track Curve

Referring to the reply to the inquiry of Ostel Bullock, Coal Age, June 12, p. 1036, permit me to describe a method of laying in such a curve that has been used with good success. It is as follows:

A straight-edge 10 ft. long and 3 or 4 in. wide is made from ⅞-in. good dressed pine. At the center on one edge of this strip is constructed a projection having a height equal to the middle ordinate of a 10-ft. chord of the curve it is desired to lay out. For a 60-ft. radius, the middle ordinate of a 10-ft. chord is 2½ in. For a 100-ft. radius curve, which is used more frequently than curves of 60 ft. radius, the middle ordinate of a 10-ft. chord is 1½ in. The middle ordinate of a chord is always one-fourth of the tangent deflection for that chord. Hence, the middle ordinate o of any chord c for any radius R may be calculated by the formula



$$o = \frac{c^2}{8R}$$

Assuming that the PC point of the curve has been located on the center line of the entry, which is the point where the curve begins, the first step is to locate a point on the curve 5 ft. distant from the PC point by measuring an offset from the center line of the entry. This offset is equal to the middle ordinate of the 10-ft. chord, which in this case is 2½ in.

Now, having located the first point on the curve 5 ft. from the PC point, lay the straight-edge on the floor of the entry in such a position that one end corresponds to the PC point and the top of the projection at the middle of the template corresponds to the 5-ft. point just located. The other end of the straight-edge will now indicate a second point on the curve, 5 ft. beyond the first point, the straight-edge itself corresponding to a 10-ft. chord.

The template is now moved forward 5 ft. and when one end is made to correspond with the first 5-ft. point of the curve and the top of the middle projection corresponds to the second 5-ft. point on the curve, the other end of the template will indicate a third point on the curve 5 ft. distant from the second point.

By thus repeating the process, the entire curve is run, the accuracy of the work depending on the care taken in establishing each successive point. If a transit is available, it is of course much better to locate points on the curve by its use in the ordinary way, deflecting the proper angle from the tangent for the longest chord that permits a clear sight in the entry. When this is done, intermediate points can be established by the use of the template as described. However, when a transit is not available, the entire curve can be laid in with an error not exceeding a few inches if care is taken in performing the work.

G. G. Long.

Curtisville, Penn.

Mining Laws and Legislation

Letter No. 5—That the bituminous mining laws of Pennsylvania are inefficient in the power they confer on the mine inspector to enforce the provisions made for the safeguarding of life was very vividly and emphatically demonstrated in the explosion at the No. 3 mine of the Smokeless Coal Co., at Ferndale, a suburb of Johnstown, in the latter part of May, 1915, when nine lives were sacrificed to a vagary.

An examination of the mine after the explosion, by a committee of four mine inspectors, revealed the fact stated in their report that the explosion was caused by a shot fired in a live entry, which released a pocket of gas and caused an initial explosion that, assisted by the coal dust present, was extended so as to cover a large section of the mine and reached the ventilating machinery on the surface.

In this case, the coroner's jury returned a verdict that the victims met their death under the circumstances stated, which were made possible by the failure of the officials of the company to follow the suggestion of the district mine inspector and install safety lamps in that part of the mine. It seems to me that the jury did not return a just verdict in the placing of the blame. It would have been just as consistent for them, under the circumstances, to have returned a verdict placing the guilt upon the mine inspector for not enforcing his suggestion.

Under art. 10, sec. 1, of the bituminous mine law, the inspector can exercise discretionary powers in enforcing the installation of safety lamps wherever explosive gas can be detected by an approved safety lamp, while under art. 28, sec. 2, his discretionary powers are revoked as not applying "to any mine wherein explosive gas is being generated only in live entries." In the discussion of mining laws and legislation, in Letter No. 36, Coal Age, Mar. 6, p. 433, a writer called attention to this discrepancy and contradiction in the law and pointed out the danger of the defect in just such a case as the one quoted here, citing as an illustration the Cincinnati mine disaster that occured Apr. 23, 1913.

The present mining law has now been operative for a period of four years, and the executive officers of the state have undoubtedly been aware of the existence of this clause restricting their authority in the enforcement of proper safety provisions and the danger necessarily arising from such restriction. Why then, it may be asked, have they not made some attempt to have this legal defect removed? They are the men who are held responsible for the enforcement of the law and to a strict accountability for the accidents occurring in their several districts; and it seems to me that they are the men who should see to it that the law is explicit and comprehensive enough to be enforced when such enforcement becomes a matter of necessity. There seems to be something radically wrong on the part of some one when a law that permits lives to be put in jeopardy is allowed to remain operative, while no effort is made for its annulment.

The primary object of law is to secure the greater safety of lives and property, but here is a proviso that tends to defeat that object. If the mine inspectors will not take any active measures to have this section repealed, then the mine officials, together with the miners themselves, should take active measures for its abolition. The present case is an instance where the inspector's duty was restricted to a suggestion and the officials' compliance was optional. Both parties, in pursuing the course they did, were within the law; and I would ask, Why is it claimed that the operators were at fault? Would not a more just verdict, in this case, have stated that the nine victims were legally murdered, since their death resulted in full compliance with the law?

The suggestion of the inspectors' committee was simply a synopsis of the legal provisions for safety and contained no reference to the dangerous and objectionable section to which I have referred, either as to its existence, revision or elimination.

In closing permit me to offer a suggestion that appeals to me as worthy of the careful consideration of mining men in general and of legislators in particular. The suggestion is that as a safety precaution boreholes be kept not less than 3 ft. in advance of all holes drilled to fire a blast, on both ribs in all solid workings, whether the mine be gaseous or nongaseous.

A. M. Iner.

——, Penn.

Study Course in Coal Mining

By J. T. Beard

The Coal Age Pocket Book

Effect of Pressure on Fusion—Pressure acts to oppose increase of volume. Some substances, as water, for example, expand when passing from the liquid to the solid state and an increase of pressure therefore **lowers the freezing point** of such substances. The decrease of atmospheric pressure at high altitudes facilitates the formation of ice, though to a less degree than other more potent causes.

On the other hand, some substances, as wax, contract when solidifying, and an increase of pressure then acts to **raise the freezing point** or point of solidifying. In other words, an increase of pressure acts to assist the melting of wax and similar substances, while it retards that of ice.

Melting Points of Substances—The melting point of substances depends largely on their purity and treatment. For this reason different authorities often give different values for the same substance. The following table gives the approximate melting points and the heat of fusion, in British thermal units per pound, for the substances named:

MELTING POINTS AND HEATS OF FUSION OF SUBSTANCES

Substance	Melting Point, Deg. Fahr.	Heat of Fusion, B.t.u. per Lb.
Aluminum	1211	138.6
Beeswax	148	76.1
Copper	1980	77.4
Gold	1947	....
Ice	32	144.0
Iron, cast (white)	2000	41.4
Iron, cast (gray)	2400	59.4
Iron, wrought	2820	....
Lead	620	9.0
Nickle	2600	8.3
Platinum	3100	48.6
Silver	1764	37.9
Spermaceti	120	66.5
Steel	2462	36.0
Sulphur	235	16.2
Tallow	92	....
Tin	450	25.6
Zinc	786	50.4

To express heat of fusion in calories per kilogram:

B.t.u. per lb. × 5/9 = cal. per kg.

Difference Between Melting and Freezing Points—The melting point of a substance does not always correspond exactly with its freezing point, even at the same pressure. The melting point of ice is more uniformly constant than the freezing point of water, and for this reason is taken to indicate the zero of the centigrade scale (32° F.).

The solidification of a liquid is generally accompanied with crystalization, and the formation of the crystals is often delayed in a quiet medium, so that the temperature of water free of air may fall as low as 5 deg. F. when perfectly quiet and not freeze. But if the water at this low temperature be stirred or jarred the whole will instantly change to ice or become solid.

The Coal Age Pocket Book

Effect of Pressure on Vaporization—Pressure acts to retard vaporization. An increase of pressure, therefore, **raises the boiling point** of water and other liquids. For the same reason a decrease of pressure lowers the boiling point of liquids. At an elevation of 10,000 ft. above sea level, under normal atmospheric conditions, pure water boils at 193 deg. F., and at an elevation of 15,000 ft. the boiling point, for the same normal atmospheric conditions, is reduced to 185 deg. F.

Vaporization, Evaporation, Boiling—Vaporization is a general term relating to the formation of vapor, or the change from a solid or liquid state to a vaporous or gaseous condition, without regard to whether the change is slow or rapid.

The term "evaporation" relates to the slow vaporizing of a solid or liquid that takes place at its surface when the latter is exposed to an atmosphere that is not fully saturated. The evaporation of a liquid may also be caused by the application of heat.

The term "boiling" refers to the violent ebullition that takes place throughout the mass of a liquid, caused by the formation of vapor in the liquid and its escape to the surface. Boiling results from the application of heat to the liquid, or may result from a sudden decrease of pressure.

Boiling Points of Liquids—A liquid boils when raised to such a temperature that the tension of its vapor is equal to the pressure at its surface. At this point the liquid becomes vapor. The term "boiling point," as commonly used, however, refers to atmospheric pressure at sea level, unless otherwise stated. The following table gives both the freezing and the boiling points of a few liquids of interest in mining:

FREEZING AND BOILING POINTS OF LIQUIDS

Liquid	Freezing Point, Deg. Fahr.	Boiling Point, Deg. Fahr.
Alcohol	—202	172
Ammonia	..	140
Linseed oil	—18	597
Mercury	—38	676
Nitroglycerine	45	...

Mechanical Equivalent of Heat—Since heat is assumed to be a form of energy, it must be capable of performing work, which is expressed in foot-pounds. This has given rise to what is properly called the "mechanical equivalent of heat." It is the theoretical amount of work expressed in foot-pounds or kilogram-meters per unit of heat absorbed.

The values of the several heat units are as follows:

	Foot-Pounds	Kilogram-Meters
1 British thermal unit	778	107.5
1 calorie	3087	426.8
1 pound-calorie	1400	193.5

The reverse of these values is as follows:

	B.t.u.	Cal.	Lb.-Cal.
1000 foot-pounds	1.285	0.324	0.714
1000 kilogram-meters	9.297	2.343	5.168

Inquiries of General Interest

Testing Safety-Lamp Glasses

Kindly describe the tests to which glasses for use in safety lamps are subjected by the Federal Bureau of Mines before they are approved by the bureau.

FIREBOSS.

Floreffe, Penn.

The Federal Bureau of Mines has outlined in schedule 7, issued by the bureau Jan. 30, 1915, certain tests of miners' safety lamps that will enable the bureau to establish a list of so-called permissible safety lamps for use in mines in which explosive gas is liberated. The schedule is entitled "Procedure for Establishing a List of Permissible Miners' Safety Lamps." Safety-lamp glasses are actually tested twice—once in the fully equipped lamp and again when separated from the lamp. The first set of tests is for the purpose of determining the strength of the glass to resist breakage when in place in the lamp. The three tests are as follows:

1. The lamp fully equipped is suspended at a clear height of 6 ft. above a wooden floor and dropped. The lamp is subjected to five trials. If the glass is broken once only, the lamp passes the test. If the glass is broken twice, the lamp is subjected to five more trials, when two more breaks will determine the failure of the lamp to pass the test.
2. A lead disk, 3 in. in diameter and 1¾ in. thick, weighing 5 lb., is dropped from a clear height of 6 ft. onto the lamp standing vertically on a wooden floor beneath. Should the glass break in the lamp, two more trials are made, each with a different glass fitted in the lamp. A second break in these three trials will determine the failure of the lamp to pass this test.
3. The lamp is suspended by means of claws gripping the top of the lamp, at a height of 7 ft. above the floor. A lead disk, 4¾ in. in diameter and 1½ in. thick, weighing 10 lb., is attached to a cord the other end of which is fastened to the center of a metal plate that is firmly attached to the bottom of the lamp. When all is ready, this weight is dropped through a clear distance of 6 ft., the purpose being to test the resistance of the lamp to being pulled apart. The lamp is subjected to three trials, and if any one of these trials shows the lamp to be defective in any way or lacking the necessary security in gas, the lamp fails to pass the test.

These three tests are made in succession on one lamp, and cracking of the glass is regarded as a breakage.

Lamp glasses designed for use in safety lamps are subjected to two tests when separated from the lamp. These tests are designed to show the resistance of the glass to breakage by reason of a blow or by reason of a sudden change of temperature, such as may be caused by water coming in contact with a hot glass. These tests are as follows:

1. A lead disk, 2½ in. in diameter and ½ in. thick, weighing 1 lb., is dropped from a clear height of 4 ft. onto the glass placed in a vertical position on a wooden floor. Twenty glasses of a kind are tested, and two failures by breakage cause the rejection of this type of glass.
2. Ten glasses of a kind are heated in an air bath to a temperature of 212 deg. F., and at that temperature are removed from the bath and immediately plunged into water at a temperature of from 60 to 65 deg. F. One failure by breaking or cracking of the glass in these 10 samples will cause the rejection of this type of glass.

Where lamps have two glasses, the outer glass is tested to determine its resistance to a blow, while the inner glass is tested to determine its ability to withstand change of temperature only.

⁂

Electric-Power Transmission

Kindly explain what size of wire would be required to carry an electric current sufficient to charge a storage-battery locomotive equipped with 50 Gould special lead cells of 300-amp. capacity. The charging station is 3000 ft. from the substation. The pressure at the substation is 250 volts, while that required for charging is 125 volts.

JOHN F. BUTLER.

Roderfield, W. Va.

The question, as stated, is slightly ambiguous in respect to the current capacity. It is not certain from the wording of the question whether the charging rate is 300 amp. or whether the capacity of the cells is 300 ampere-hours, since it is customary to give the capacity of storage-battery cells in ampere-hours.

However, assuming that the charging rate is 300 amp., and allowing for a line drop of 250 — 125 = 125 volts, the circular mils of wire required to transmit a current of 300 amp. 3000 ft. and return is given by the formula

$$\frac{21.6 \times 300 \times 3000}{125} = 155{,}520 \text{ circ.mils.}$$

A No. 000 copper wire has a sectional area of 167,800 circ. mils, while a No. 00 wire has an area of 133,100 circ. mils. Since the result obtained above lies between these two values, a No. 000 copper wire should be used for this transmission.

Assuming, however, that the cell capacity is 300 amp.-hr. and taking the efficiency of the storage cells as 80 per cent., the required input when charging is 300 ÷ 0.80 = 375 amp.-hr. It is customary to assume an 8-hr. charging rate; and, in that case, the charging current would be 375 ÷ 8 = 47 amp., nearly. Therefore, taking the required charging current as 50 amp., the circular mils of copper wire required to transmit a current of 50 amp. 3000 ft., allowing for a line drop of 125 volts, is

$$\frac{21.6 \times 50 \times 3000}{125} = 25{,}920 \text{ circ.mils.}$$

For this transmission, a No. 6 copper wire should be selected, having an area of 26,250 circ. mils, as taken from electric-wire tables.

Examination Questions

Illinois Examination for Mine Managers, June 14, 1915

(Selected Questions)

Ques.—Find the specific gravity of a mixture containing 1 cu.ft. of air, 2 of hydrogen, 3 of carbon dioxide and 4 of nitrogen.

Ans.—Hydrogen being the lightest of these gases, it will be more convenient to refer the density of the other gases to this element as unity; thus, the density of air referred to hydrogen is 14.4; that of carbon dioxide is one-half its molecular weight, or ½ (12 + 2 × 16) = 22; while that of nitrogen is expressed by its atomic weight, 14. The volume of each gas multiplied by its density expresses the relative weight of the gas referred to hydrogen as unity, which gives the following:

	Vol.		Density		Weight
Air	1	×	14.4	=	14.4
Hydrogen	2	×	1	=	2
Carbon dioxide	3	×	22	=	66
Nitrogen	4	×	14	=	56
Totals	10				138.4

The density of this mixture referred to hydrogen as unity is then found by dividing its relative weight by the total volume of the mixture; thus, 138.4 ÷ 10 = 13.84. That is to say, the mixture of these gases is 13.84 times as heavy as hydrogen, volume for volume.

To find the specific gravity of this mixture referred to air as unity, divide its density referred to hydrogen by the density of air referred to the same standard. Thus, 13.84 ÷ 14.4 = 0.961, which is the specific gravity of the mixture referred to air as unity.

Ques.—A pair of hoisting engines has cylinders 30 in. in diameter and the stroke is 5 ft. If the steam pressure in the boilers is 90 lb. per sq.in., how many revolutions per minute will these engines be running when generating 1000 hp.?

Ans.—Taking the boiler pressure as 90 lb. gage and allowing a drop of, say, 3 lb. between the boiler and the steam cylinders of the engine, and assuming a two-third cutoff for a slide-valve engine, the mean effective pressure in the steam cylinders may be estimated as 68.6 lb. per sq.in. The total area of the two cylinders is $2\ (.7854 \times 30^2) = 1413.7$ sq.in. Since the engine makes two strokes per revolution, the work performed by the two cylinders during a single revolution of the engine is 68.6 × 1413.7 × 2 × 5 = 969,800 ft.-lb. Then, since 1000 hp. is 1000 × 33,000 = 33,000,000 ft.-lb. per min., the speed of this engine to develop this power must be 33,000,000 ÷ 969,800 = 34 r.p.m.

Ques.—What is the horsepower required to drive a fan producing 60,000 cu.ft. of air per minute with a water gage of 1.7 in.? If the quantity be increased to 100,000 cu.ft. per min., how much additional power will be required?

Ans.—For a circulation of 60,000 cu.ft. per min. under a water gage of 1.7 in., the power on the air is (60,000 × 1.7 × 5.2) ÷ 33,000 = 16+ hp. Then assuming an efficiency of 60 per cent. for this circulation, the power required to drive the fan is 16 ÷ 0.60 = 26.6 hp.

Since the power on the air varies as the cube of the quantity of air in circulation, the effective horsepower required to increase this air volume from 60,000 to 100,000 cu.ft. per min., calling the required hp. x is

$$\frac{x}{16} = \left(\frac{100{,}000}{60{,}000}\right)^3 = \left(\frac{5}{3}\right)^3 = \frac{125}{27}$$

$$x = \frac{16 \times 125}{27} = 74 + hp.$$

The gross horsepower required to drive the fan in this case is 74 ÷ 0.60 = 123 hp.

Ques.—An entry contains a mixture of 65,000 cu.ft. of firedamp and air. If 10 per cent. of firedamp is present, find the additional quantity of air necessary to dilute it to 2 per cent.

Ans.—The volume of marsh gas present in this firedamp mixture is 65,000 × 0.10 = 6500 cu.ft. If this quantity of gas is 2 per cent., the total volume of the mixture after the addition of air is 6500 ÷ 0.02 equals 325,000 cu.ft. The quantity of air required to be added to produce this volume is then 325,000 — 65,000 = 260,000 cu.ft. of air.

Ques.—If a wedge is 12 in. long and 3 in. thick, and the pressure 100 lb., what weight will be lifted?

Ans.—Assuming the wedge is 3 in. thick at the butt and disregarding friction, the ratio of the pressure applied to drive the wedge to the weight lifted is equal to the ratio of the thickness of the butt to the length of the wedge. Since the length of the wedge is four times the thickness of the butt in this case, the theoretical weight lifted by a force of 100 lb. will be 4 × 100 = 400 lb.

Ques.—You are asked to state what you understand by the term "potential" and "potential difference," in electrical appliances.

Ans.—The term "potential," as applied to electricity, describes the electrical pressure required to pass a certain current through a conductor having a given resistance. Potential in electricity corresponds to pressure or head in hydraulics.

The term "difference of potential" is the difference of electrical pressure between two points in the circuit. In other words, it is the effective pressure required to pass the current through that section of the circuit lying between the two points in question.

Ques.—To light a mine with 200 lamps of 16 cp. each, what amount of mechanical energy would have to be available for conversion into electricity?

Ans.—The ordinary 16-cp. incandescent lamp, operated on a 110-volt circuit consumes, say 3.5 watts per cp. The total wattage required to operate a system of 200 such lamps is 200 × 16 × 3.5 = 11,200 watts, which is equivalent to 11,200 ÷ 746 = 15 hp. Now, allowing for an efficiency of 80 per cent. in this system, the mechanical energy required is 15 ÷ 0.80 = say 20 b.hp., making no allowance for transmission in the mine.

Coal and Coke News

Washington, D. C.

The Interstate Commerce Commission has handed down a decision in the co-called Industrial Railways case which is likely to be of considerable interest and importance to coal producers, in two ways. Considerable coal is transported over these roads to industrial plants which are large consumers of fuel, while the effect of the decision on the general tariffs of the long haul roads is of importance to shippers of all classes of goods and especially to those shipping the heavier articles.

The case in question is that docketed as "In the matter of allowances to short lines of railroad serving industries" and is concerned with the lines of those carriers which have been owned as a rule by industrial concerns which needed direct connection with a trunk line. Some time ago, following the original report of the Commission in the Industrial Railways case, the trunk line carriers in official classification territory. withdrew from joint rate arrangements heretofore had with the industrial roads and also with substantially all other industrially owned lines in the territory which were not involved in that proceeding.

Altogether, more than 47 industrial roads became involved in the proceeding and the Interstate Commission set out to gather the facts regarding the history, operation and practices of each of the lines thus involved. Circulars were mailed to each carrier and the replies tabulated. The Commission sought to establish in each case whether the line affected was a bona fide common carrier, whether the service performed by it was a "plant service" or was public transportation, and whether a charge should be made for such service in addition to the line haul rate applicable to or from points on the rails of the trunk line at the junction.

With these questions there was also to be considered the larger economic question whether or not part of the money paid to the trunk line carriers for public transportation service is to be used to defray the expense of particular shippers in conveying their traffic to and from the terminals of the trunk line carriers.

The Six Groups of Carriers

Pursuing its inquiry, the Commission finds that the carriers referred to may be divided into six groups, each of which is subject to somewhat different conditions of traffic, ownership, or control. In all, however, the Commission holds that the conditions which originally gave rise to the present system of industrial railways, with their special and independent rate structure, have altered, so that on the whole it is deemed wise to follow with them the course adopted in the Tap Line cases, by requiring that each line which becomes a party to a rate arrangement with a road shall file immediately upon the consummation thereof a full statement of the arrangement entered into, showing specifically the basis of rates to be applied from points on industrial lines and the basis of the allowances or divisions thereof granted under the agreement.

In general, justifying this finding, the Commission holds that:

1. The principles laid down in the original industrial railways decision some time ago do not apply to sundry of the lines with which joint arrangements have heretofore been cancelled by the long-haul lines.

2. Some of the industrial lines are distinguishable from those discussed in the Tap Line cases only in that the Tap Lines are not located within a territory from which rates are made under a large blanket of originating points.

3. Some of the industrial lines while maintaining the form of common carriers are in effect performing only private transportation.

4. Some of the industrial lines, like the Tap Lines, should have joint rate arrangements, but the basis of rates should be revised.

5. Some of the industrial lines have taken on the form of common carriers by means of leases of facilities of the trunk lines, and such arrangements are in some cases a device to defeat the law.

6. Some of the industrial lines are not common carriers in any sense.

In concluding its opinion requiring the publication of industrial railway tariffs and the filling of the divisions and arrangements thereof, the Commission says:

> These cases (referring to certain which it has cited) illustrate the passing of the necessity for that provision of section 15 under which shippers may be compensated by the trunk lines for their facilities used in the handling of their own shipments. This legislative measure was enacted to give this Commission a means of eliminating certain unjust discriminations. The gradual elimination of discriminatory practices by other processes leaves this provision of the law to be used as a cloak for various payments which, but for it, would be looked upon as rebates. The Commission will look to the trunk lines to reform their tariffs and file with this Commission whatever arrangements they may make with the industrial lines here in question in the light of this report.

PENNSYLVANIA

Anthracite

Plymouth—Since the closing down of the Dobson No. 12 colliery through litigation several months ago, the mine has been flooded with water from adjoining workings, the level now being up close to the mouth of the shaft. Some of the water has leaked into the red-ash vein of the Gaylord colliery closing 30 places.

Wilkes-Barre—The Pennsylvania Coal Co. has been made defendant in a $50,000 damage suit entered by Franciska Guinta, of Pittston, on behalf of herself and minor child. Her husband, while employed at No. 6 colliery, was killed by a premature explosion.

In a majority opinion renderd recently, Judges P. A. O'Boyle and John M. Garman fixed $3000 per acre as a fair and equitable assessment on coal land. Judge H. A. Fuller in a dissenting and minority opinion fixed $1920 as a fair assessment. The decision of the majority of judges sustains the action of the county authorities in fixing $3000 per acre as the triennial assessment for 1907. It is anticipated that the case in question where these opinions were derived will be appealed to a higher court.

Carbondale—Fuller E. Layman recently started a suit in trespass against the Sacandage Coal Co. to recover $5000 for damages caused to his house and lot by mine caves. In the statement accompanying the suit, Layman set forth that the company illegally removed coal from under his property causing a subsidence of the surface.

Hazleton—Because George Patrusky, a docking boss at the Evans colliery, at Beaver Meadow, changed his boarding place from a private home to a saloon against the protest of John Bredbenner, the foreman, who feared Patrusky would subject himself to bribes in the shape of drinks from the men the 100 miners of the works recently struck.

Harrisburg—Until the Supreme Court shall decide upon the constitutionality of the act of 1913 relating to certificates to be given to mine foremen and assistants, no certificates will be issued, according to a decision recently reached by the Dauphin County Court. This court has upheld the act and its decision has been appealed to the Supreme Court. It now holds in effect that the appeal acts as a supersedeas and prevents operation of the law until a final decision is reached.

Summit Hill—For several years the Bloomingdale Coal Co. has been conducting prospecting operations on land in this vicinity, but it has now abandoned the work. This has been necessitated by the fact that during all this time it has not discovered any workable deposits of anthracite.

Bituminous

Johnstown—Nicholas Losick was killed, John Dono lost his right eye and sustained severe injury to the lungs, and John Sowick, Michael Sabrick, J. E. Ellison, and John Daniels were badly injured by the accidental discharge of a quantity of dynamite at Elton on the evening of July 8. The men were engaged in sinking a shaft for the Berwind-White Coal Co.

Laborers engaged in excavating preparatory to the paving of Fern Place in this city have struck the "C" vein of coal, which lies unusually close to the surface at that point and half the material being taken out is burnable coal. The vein was struck less than 3 ft. below the surface and although mixed with a great deal of clay is declared fit for household purposes, "with a little cleaning."

Brownsville—Fifty-ovens of the Newtown plant of the H. C. Frick Coke Co. that have been idle for more than a year have been ordered fired up. Plans for the improvement and reopening of the Champion mine near Brownsville are under way. This mine has been idle for nearly two years and as a consequence contains much water in addition to many falls that have occurred since the suspension.

Pittsburgh—Judge John D. Shafer in the common pleas court of Allegheny county recently fixed the date for the sale of the Pittsburgh-Buffalo Coal Co. against which action was begun last August by the Union Trust Co., of Pittsburgh in a bill of equity. The date was set for July 15. The bill asked for the satisfaction of two mortgages, one for a $2,000,000 bond issue which the trust company financed and the second asking indemnity for a loan to the company on the paper given it by the officers of the company. This latter obligation was placed by an attorney of the company at $1,750,000 which makes the Union Trust Co.'s claim against the coal company approximately $4,000,000. Other liabilities of the company are said to total several millions more. The holdings of the company consist of five separate mines. These are the Marianna, the Hazel, the Frances, the Johnetta and the Bertha mines. John H. Jones is the president of the company and D. G. Jones is the general manager. The financial troubles of the company are said to have been hastened by the formation of the Four States Coal & Coke Co., an auxiliary concern, into which was put much of the revenue of the Pittsburgh-Buffalo Co.

Otto—The Pittsburgh Gas and Coke works at Otto, Westmoreland Co. which have been closed down for months will soon resume operations. The company has spent much money in making improvements. All the ovens have been relined while several other big changes have been made to the plant. Two new buildings are now under construction and a big force of workmen is engaged in getting the plant in readiness for a general resumption.

Connellsville—The production of Connellsville coke attained unusual activity during the week preceding July 4. Shipments reached 377,000 tons, while production was 371,000 tons. The merchant operators continue to fire some ovens and to increase their output, which ran 140,000 tons during the week in question. During the first half of the year the Connellsville coke production reached 7,300,000 tons, or at a rate less than 15,000,000 tons annually. The rate of production has been rapidly increasing, however, both in merchant and furnace ovens.

WEST VIRGINIA

Grafton—The coal and general freight trade through the northern half of West Virginia continues to hold up in a satisfactory manner and the railroads are busy. Railroad shops are working heavy forces of men to keep machinery in repair and to handle the traffic. Coal companies in this district have heavy coal orders and most of the mines are working at capacity.

Bluefield—It is said that the demand for coal is becoming greater day by day, and every factor is favorable to make July a record-breaking month, with even a greater production than June, which saw the largest month's business in the history of the Norfolk & Western R.R., except the labor supply. The output during the first few days of July was considerably short of the average daily record of June. The Fourth of July vacation was not lost sight of in connection with this alleged shortage in the output of the mines.

Charleston—Of the 30,000 Italians employed in the coal fields and lumber camps of West Virginia, fully 5000 are reservists in the army of their native country. Hundreds of these are now on their way to engage in the campaign against the Austro-Germans. The men who have left and are now leaving are what are known as "specialty men," listed on the army records as engineers, surveyors, electricians, linemen, automobilists, general machinists, etc. It is said that 100,000 Italian-Americans are answering the call of their mother country, but it is estimated that it will take nearly all summer to secure transportation facilities for all the men who have now responded. The departure of these laborers may, however, mean a considerable decrease in the output of the West Virginia coal mines.

ALABAMA

Birmingham—The first shipment of coal from the Birmingham district by water to Mobile has just been completed by the Pratt Consolidated Coal Co., the coal going through the recently completed lock 17 on the Warrior River. The shipment was of 1000 tons. Officials of the company state that the cargo of coal was delivered in Mobile at about half the cost of rail shipping. This company has just completed a new tipple and dock at Maxine where the barges are being loaded. The Maxine mine is one mile from the river and the coal is hauled from the mine in dump cars which are run out on the tipple.

Six lives were lost in the coal mines of Alabama during June.

Examinations for first and second class mine foreman's certificate and fire boss certificate will be held in Birmingham July 26-29.

KENTUCKY

Viper—The Perry County Block Coal Co. organized here recently, advises that it will begin shipping coal Aug. 2, and will have an initial output of 500 tons daily. The plant is on the main line of the Lexington & Eastern R.R.

Sturgis—The West Kentucky Coal Co. was host recently to its employees, at its annual outing.

Harlan—The Big Four order being handled by the Harlan Coal Mining Co., with another contract, enables the company to keep one of its mines operating steadily six days a week. The other two, however, as is the case with most of the mines in the section, are working on part time.

OHIO

Columbus — The Ohio Mining Department was recently called upon to settle a labor dispute at a mine in eastern Ohio. The work of taking out the pillars and ribs was being done by quite a number of men who were said not to be practical miners and a complaint was made. It was ruled by the department that only practical miners should be used in the work, and these orders were promptly complied with.

According to the report of the Ohio Mining Department for the first six months of the year, there were 22 fatal accidents in the period as compared with 35 for the first six months of 1914. While mining operations during the past six months have been curtailed and necessarily the number of men employed is smaller, it is pointed out that during three months out of the first six months of 1914 practically all of the mines in the state were idle. One of the peculiarities of the report is the fact that four miners dropped dead in the mines from heart disease, during the first six months of 1915, which is extremely unusual.

Bellaire—Announcement has been made that the local mine of the A. J. Morgan Coal Co. will be shortly abandoned and the office of the company moved to Bannock where a tipple is being constructed, preparatory to opening a new mine at that place. The abandonment of the local mine will mean that about 100 coal miners will be compelled to secure employment elsewhere, or remove to the city of Bannock.

Employees of the Rail and River mines have been idle for the past few days, in order that new scales may be installed at the mines. According to the agreement between the miners and operators, all the mines are to have their scales placed at the mines no later than July 20, or in sixty days following the ratification of the recent wage scale.

ILLINOIS

Belleville—Loot taken from the office of the Tower Grove Coal Co., on Lebanon Ave., this city, was recovered when three boys were arrested recently. The office was entered a few nights ago and everything that appealed to the fancy of the boys was taken. The stolen articles were recovered where the boys had buried them.

L. Senior, of Victoria Coal Co., with offices at St. Louis and Belleville, operating the Branch mine on the Illinois Central R.R., has announced that the Royal mine, on the Louisville & Nashville, between Belleville and East St. Louis, will be reopened as soon as repairs are finished. A new tipple is being erected. The mine was operated by the Royal Mining Co., which failed two years ago, owing the miners considerable sums. Mr. Senior has paid the miners and nothing now stands in the way of resumption.

Danville—The Illinois State Mine Examining Board had a meeting here recently. Dates announced for other meetings are as follows: Eldorado, July 13; West Frankfort, July 14; Herrin, July 15; Murphysboro, July 20; Belleville, July 21; Staunton, July 22; Pana, July 23; Springfield, July 27-28.

O'Fallon—The Joseph Taylor Coal Co. of this place has obtained a writ of certiorari in the St. Clair County Circuit Court, calling for the records in the case of Albert Southern, heard before the Illinois Industrial Board. Southern was employed in the St. Ellen mine here. He broke a blood vessel and was allowed by the Industrial Board $79.50 at the rate of $6.15 a week. Later he made another application, on the ground that he was indefinitely incapacitated and was awarded 50 per cent. of his wages until further orders of the board. The company contends the 50 per cent. award is not valid because the claim had already been adjusted.

FOREIGN NEWS

London, Eng.—Walter Runciman, president of the Board of Trade, announced in the House of Commons on July 13 that in view of the failure at agreement between the South Wales coal owners and their miners the government had decided to apply to the mining industry the Munitions of War Act. This act makes it an offense to participate in either strike or lockout unless the differences involved have been submitted to the Board of Trade, which body has referred the matter for settlement by one of the methods prescribed by the act. In this case the government takes the ground that the strike is prejudical to the production, transportation and supply of munitions of war.

Toronto, Canada—D. A. Thomas, known as the Welsh coal king, has during the last two years spent a large amount of money in prospecting along the waterways to the north of Edmonton, Alta., and is convinced of the abundance of coal resources in that district. These coal fields are to be opened up by the construction of a railroad from Athabasca to Fort Vermilion, a distance of some 300 miles. An agreement to that effect has been signed by C. S. Law, representing Mr. Thomas, and Hon. A. G. Mackay, acting on behalf of the Athabasca & Fort Vermilion Railway Co., which holds a charter from the Alberta Legislature. It is officially stated that reconnaisance work on the route will be begun forthwith by a full engineering staff. It is expected that the road will be completed within two years.

PERSONALS

John Frazier has been appointed mine manager at No. 3 mine of the Superior Coal Co., filling the vacancy caused by the resignation of John Day.

P. H. Shanahan, who has been assistant superintendent of the Superior Coal Co., at Gillespie, Ill., for several years, having come up from the position of machine runner, has been promoted to the position of superintendent.

When Deputy Mine Inspector Samuel McMahon, of West Virginia, returned home recently from his first trip of inspection he was presented with a safety razor and fountain pen as a token of appreciation from the employees of the LaBelle No. 4 mine.

Lawrence H. Underwood, for the past three years in charge of the byproducts coke plant of the Gary works of the United States Steel Corporation, has been recently appointed superintendent of the new byproduct coke plant now in course of construction for the Youngstown Sheet and Tube Co., at Struthers, Ohio.

P. J. Rogers, of Ensley, Ala., has been appointed by Governor Henderson as president of the Convict Bureau. Mr. Rogers is superintendent of the Pratt Mines Division of the Tennessee Coal Iron & R.R. Co., and was strongly endorsed for the position to which he has been appointed by his many friends in the mining circles of Alabama.

C. C. Rose, general manager of the Delaware & Hudson Coal Department, has been seriously ill at his home for some time. He has not been in good health for the last year or more having suffered much from rheumatism. He is at present in an exceedingly exhausted condition and is not gaining strength as fast as his friends might desire.

OBITUARY

William H. Gorman, president of the Gorman Coke & Coal Co., the Cumberland Coal Co., and the Piedmont Mining Co., died recently at the Bedford Springs Hotel, at Bedford Springs, Penn. Mr. Gorman was also a director of the Citizens National Bank, the Maryland Casualty Co., and the Citizens National Bank, of Laurel, Md.

Colonel Jones T. Pierce, one of the pioneer coal operators of the Birmingham district, died recently in Bowling Green, Ky. Colonel Pierce was closely connected with the early development of the district and for years was a prominent citizen of the section. He centralized his activities in the Warrior coal field where he formed the old Pierce-Warrior Coal Co. Some 20 years ago he removed to Kentucky, where he acquired interest in coal mines.

INDUSTRIAL NEWS

Pittsburgh, Penn.—The Pittsburgh Coal Co. has opened an agency at 46 Reconquista, Buenos Ayres, with C. Bulman as local manager. It has also acquired a depot at La Boca (Port of Buenos Ayres).

Washington, D. C.—The Department of Justice has announced that an appeal will be taken to the Supreme Court in the Reading coal trust case, which has been decided against the government at Philadelphia in the United States District Court for the eastern district of Pennsylvania.

Dickson City, Penn.—Becoming lost in the Johnson colliery, Lawrence Brady, a miner, 60 years old, was found after having almost succumbed to exhaustion and lack of food. He had gone into the mine to take out his tools, when his light went out and having no matches he wandered around in the dark, until his absence from home alarmed his family and a searching party was formed.

Woodward, Ala.—The Woodward Iron Co. has begun the erection of a benzol plant adjacent to its byproduct coke plant at Woodward. The plant will have a capacity of 3000 gal. This plant is built for the Woodward company and the Thomas A. Edison Co., has also just completed a benzol plant at Woodward. The Tennessee Coal & Iron Co. is nearing the completion of its 12,000 gallon benzol plant at Fairfield.

Philadelphia, Penn.—The Lehigh Valley R.R. Co. is using the tug "Wyoming," of its coal barge towing fleet, as the basis of experimenting with a coal saving device. The apparatus consists of a superheater placed over the boilers of the tug and it is confidently predicted that the mechanism will be the means of a fuel saving of over $3000 on this one boat alone, in addition to which greater motive power is derived from the steam.

Harrisburg, Penn.—The Auditor General's office is sending out notices to 130 coal producing companies in the various anthracite districts requesting them to make a return of their June production in accordance with the new coal tax law enacted by the last legislature. This is an increase of 10 companies over those reporting under the law of 1913, as the present act has been drawn to include all companies operating coal bank washeries.

Athens, Ohio—With the view of relieving destitution among the miners and their families in the Hocking Valley where many mines have been closed down completely, Governor Willis, of Ohio has called upon the Ohio Highway Commission to have the contracts for road improvement in the vicinity of Athens, Nelsonville and Gloucester pushed. Considerable road improvement in that section is contemplated and it is believed that miners will seek employment at this work.

Cincinnati, Ohio—Two coal steamers were sunk in the local harbor on the Ohio River during the terrific rain-and-wind storm on the evening of July 7. The "Convoy," belonging to the Hatfield Coal Co., of Covington, Ky., capsized and sank, with a number of her crew, and the towboat "Fulton," belonging to the Monongahela River Consolidated Coal & Coke Co., used as a harbor boat here, was sunk when struck by an empty barge which had broken loose. Capt. Bradley Williams, of the "Fulton" was missing after the storm cleared away, and is believed to have been lost.

Birmingham, Ala.—The petition against the Louisville & Nashville R.R. and Southern Ry. for a rate of 50 cents per ton on steam coal for manufacturing purposes was denied, by the State Railroad Commission recently. The commission ordered the Louisville & Nashville to establish a rate of 60 cents per ton on coal from mines located on the Helena, Blocton, Colena, Belle Ellen and Acton branches to the Keystone Lime Works at Keystone and other lime kilns at Wilmay, Saginaw, Longview and Vernon. All petitions for increase of coal rates into Birmingham were denied by the Commission.

Philadelphia, Penn.—The Board of Commissioners of Navigation has compiled and published the export statistics of this port for the six months ending June 30. During that period there has been loaded over the piers into both foreign and coastwise bottoms 434,874 tons of bituminous coal as compared with 317,498 tons for the same period of 1914; and 24,959 tons of anthracite as against 20,574 tons in 1914. The increase of over 100,000 tons of bituminous is accounted for by the extended inquiries for coal from abroad since the beginning of the war, and an even greater increase is predicted for the last half of the year judged by the way the tonnage is going forward this month.

Coal Trade Reviews

General Review

Anthracite being offered at heavy concessions. Large accumulations of nut coal. Export bituminous trade continues the predominating feature. Domestic market lifeless. Improved tone in the Middle West.

Competition has become so keen in the anthracite market that even conservative old-line companies, handling the very best grades, are being forced to make concessions. There is a notable dearth of new business which will be even more acute over the last half of the month unless the retail movement increases. Although mining operations are heavily restricted, abnormal supplies are accumulating in all directions particularly on chestnut coal, the situation on which is rapidly becoming acute. Poor collections among the retailers continue the rule and this is being reflected back to the operators; particular significance is attached to this feature by the failure of two weak members of the trade and there is some anxiety among the large operating companies regarding long deferred payments.

An exceptionally heavy export movement from the Virginia piers is the predominating feature of interest in the bituminous trade. The demand has been so insistent that a few agencies have even become short of supplies and are urgently crowding the railroads for rush shipments. This is in great contrast with recent conditions at that point as well as the current situation in the other markets.

Stocks at Tidewater are still large and occasional cargoes can usually be picked up at low prices without much difficulty. There is no activity in any line except industries working on war orders and shipments are confined almost entirely to contracts. There is, however, a distinct feeling that the coastwise market is gradually toning up and conservative interests are a trifle more cautious over future commitments though there has been no significant price change of any kind.

So little spot business is being done in the Pittsburgh district that prices are not well defined though they are probably even lower if anything. Operations are at 50% capacity and there is considerable coal accumulating that is difficult to move. The Lake shipments have proved particularly disappointing and the movement for the current month will probably be even less than June.

An increased movement of West Virginia coal in the Lake trade has encouraged the Ohio operators somewhat, even though they have not benefited materially. Otherwise the market situation is discouraging. The manufacturing demand continues to lag appreciably behind normal, and the demand is limited in all directions. Some stocking for domestic purposes is being done, and the threshing trade is absorbing a small tonnage, but all branches are unusually quiet.

There is a greater improvement in the Middle West where the business for the current month shows some increase over June. General quietness still prevails, and there are even a few weak spots, but there is a growing conviction that the demand will be on the increase from now on, in spite of the waiting attitude among the buyers. A significant development has been the resumption of the full-time operations at the Gary Steel Mills for the first time since 1912. Other features of a constructive nature are the restrictive programs regarding mine operations, anticipation of greater coöperation among the operators, and the expectations of a heavy rush for coal the coming fall.

A Year Ago—Anthracite trade has touched the low point of the year with buying somewhat less than customary. Eastern bituminous market under heavy pressure. Curtailment of operations and tendency to hold tonnage closely are the most encouraging features. Middle Western trade developing a steadily accumulative strength.

BUSINESS OPINIONS

American Wool and Cotton Reporter—More inquiry has developed from the woolen mills during the week than has been in evidence for some time. The light weight goods season is beginning and duplicate orders have been made on heavy weight goods. Growers are still maintaining firm prices, as well as the dealers. The trend is still decidedly upward.

Boston News Bureau—The situation continues to show that the influences bearing upon it are not generally known or understood. The conditions operating change quickly and a man is at loss to shape his conclusions. The astonishing fact is that the loans made by the allies since the war have reached over ten billion dollars, and Germany and her allies have borrowed half as much, making total war loans to date about sixteen billion dollars. It is very possible that the enormous cost of the war may force the question of peace earlier than the reports from the field indicate. Some good people are banking on this idea.

Iron and Steel—The rapid and continued strength and increase in activity in the steel trade in suprising. The United States Steel Corporation has purchased 55,000 tons of billets and with 80% of its blast furnace capacity in operation is not making any especial headway on accumulated orders. Its export business alone amounts to 10,000 tons a day. Structural steel work is much more active. The fabrication shops of the country are operating to 80% of capacity compared with 30% at this time last year. An order for 200,000 tons of rail from the Russian Government is under negotiation by two of the largest independent companies; French interests are also endeavoring to buy 20,000 tons of rails. Domestic business is more active. The Burlington has purchased 2000 freight cars.

Government Crop Report — The Government's condition estimate of 93.3% on the spring wheat crop is the highest for July since 1904. The estimate of 295,000,000 bu. spring wheat for the country as a whole gives the three Northwestern States 227,00,000 bu. or 19,000,000 bu. over last month's estimate, and compares with 207,000,000 bu. estimated a year ago. The corn crop indication of 2,814,000,000 bu. is the third largest on record, but compares with 2,916,000,000 bu. a year ago. Oats promises to be the largest crop on record, and, unless seriously damaged, the final returns are estimated to exceed the record yield of 1,418,000,000 bu., the present estimate being only 19,000,000 bu. under that figure. The trade considers the report as bearish on all grains. The carry-over is 55,000,000 bu. of wheat, against 76,000,000 bu. last year.

Marshall Field & Co.—Wholesale shipments of dry goods have been about normal. Collections have been exceedingly good, as compared with those of the same week a year ago. Buyers are beginning to arrive in the market from the far Western States to look at fall lines.

Bradstreet's—Irregularity in distributive trade contrasts with enlarging activity in industrial lines, continued absorption of idle workingmen, heavy war orders, increased bank clearings, and a generally good crop outlook, notwithstanding rainy weather at harvest in parts of the winter wheat belt. Except in sections where seasonably dry weather has prevailed, selling by final purveyors has been checked by low temperatures or too much rain.

Dun's—Uniform progress is not to be expected at this period, when inventorying and the advance of the vacation season tend to produce quietness in various mercantile lines. It is significant of the economic changes resulting from the war, however, that industrial conditions do not reflect the usual mid-year lull, and all indications point to fully sustained activity throughout the summer months.

ATLANTIC SEABOARD

BOSTON

Better trend in Pocahontas and New River. Excessive water power restricts coal consumption. Delivered prices still low in spite of diminished receipts. Georges Creek in demand off-shore. Certain Pennsylvania grades in strong position. Anthracite inquiry sags off.

Bituminous—The demand off-shore is moderately active and so long as that continues the Pocahontas and New River shippers will be relieved of any special pressure to move coal. Concessions in price are still confined to a few factors and there is now a distinct feeling that the coastwise market is gradually toning up. So far there has been nothing significant in the way of price movement, but the agencies are beginning to be cautious about giving options and there is a more conservative trend with regard to futures. Not much improvement can be looked for in this territory so far as demand is concerned for most of the contracts have now been closed, but with the export trade in good shape it is probable that prices f.o.b. will strengthen as fall approaches.

The extra inquiry that was expected on account of deficient water-power will not materialize because of a heavy fall that has more than made up for the dry season earlier. Delivered prices show no change. Distributors inland have large stocks and still seek to place current coal at minimum prices. Arrivals have been rather less than normal however, and there is very little free coal afloat.

Only small tonnages of Georges Creek are available for this market. The bulk of this grade is still being loaded for export, and barges and steamers for New England ports are obliged to wait until foreign bottoms have been given clearance. The chief shippers stand in favorable relation to new business that develops from the Mediterranean.

One of the features of the present market is the strong position of some of the Pennsylvania grades. Several of these have ample business in hand until the fall demand starts in. The choice Cambrias and Somersets have not only held their tonnage in this territory but in several instances they have made notable inroads, and this notwithstanding the low prices named by Hampton Roads shippers. More than a few of the Pennsylvania grades have now established themselves in quarters where formerly nothing but Pocahontas and New River would be considered.

Water Freights continue about as last reported; 80c. on barges, 2500 tons upward, is the prevailing rate, Hampton Roads to Boston, with only a light demand; 40c. is still the rate from New York to Providence and Fall River. The rate on hatch-loads of bituminous in anthracite carrying transportation, Philadelphia to Boston, continues at 80c.

Anthracite—While orders are still in fair supply with most of the shipping companies, there is beginning to be a dearth of new business. The latter part of July is likely to see the demand very light and to continue so until retail stocks begin to move faster to the consumer. Concessions are made more freely even by conservative shippers, but such inducements are no more than as usual at this season.

Current quotations on bituminous are about as follows:

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines*	$0.85@1.40	$1.15@1.60	$1.67@1.77	
Philadelphia*	2.10@2.65	2.40@2.85	2.92@3.02	
New York*	2.40@2.95	2.70@3.15	3.22@3.32	
Baltimore*	....	....	2.85@2.95	
Hampton Roads*	....	....	....	$2.70@2.80
Boston†	....	....	....	3.55@3.68
Providence†	....	....	....	3.45@3.68

* F.o.b. †On cars.

BALTIMORE

Export shipments slowing down. War business marks only real industrial activity. Prices continue low.

From present prospects the July exports will fall off to about the 100,000-ton mark, which is regarded by many shippers here as nearer the true basis for the future. Last week the cargo coal loaded totaled 56,192 tons, although of course there was one holiday during the period. Outside of this there is little real industrial activity except on war orders. Machine shops here are busy and khaki and cotton duck plants are working on large orders. Elsewhere there is little business enthusiasm, and not much prosperity talk is heard.

The situation is well reflected in the coal trade, despite the big comparative movement of coal on export. Prices continue weak and producers find it difficult to keep enough of their product moving to prevent congestion at the mines. High-grade coals of West Virginia, Maryland and Pennsylvania are selling at from $1.20 to $1.40. Low-grade West Virginia and Maryland coals are offering down to 75 and 80c. to the trade at the mines, with ordinary Pennsylvania coals at 90 to 95c. Mines that are covered at all well with contracts are not letting fuel go at all on the present spot prices.

NEW YORK

Export demand increasing. Local market continues quiet. Spot business dull. Contract coals moving well. Anthracite situation unchanged. Inquiry from abroad for hard coal. Small steam sizes show improvement.

Bituminous—There is very little demand for spot coal and prices are unchanged. Interest is centered on the export demand which seems to be increasing. Contract holders are taking their full quota and many large users are picking up odd cargoes to replenish their stock piles.

The suspension of mining over last week's holiday and a few days idleness following, affected production materially. While the docks are filled there is not so much coal on hand as to affect prices. Spot orders are scarce.

Operations continue on about half-time basis and shippers do not look for much new business until fall. While stray cargoes of fair coals have been picked up at low prices choice grades have been held at good figures.

The brightest feature of the situation continues to be the export trade. Much coal is being shipped to Halifax, it being reported that many schooners have left this port for that vicinity. Exporters report having received additional inquiries from France, Italy and Spain. While considerable business is being closed, shippers complain of the excessive freight rates. The demand for bunker coals is also on the increase.

Current quotations are on the following basis:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.30@3.40	$3.30@3.40	$3.30@3.40	$1.75@1.85
Georges Creek Tyson	2.90@3.00	2.90@3.00		1.35@1.45
Clearfield:				
Medium	2.65@2.80	2.55@2.65	....	1.10@1.25
Ordinary	2.55@2.60	2.55@2.60	....	1.00@1.10
Broad Top Mountain				1.10@1.45
Cambria County:				
South Forks	2.90@3.05	....	....	1.35@1.50
Nanty Glo	2.75@2.80	....	....	1.20@1.25
Barnesboro	2.65@2.70	....	....	1.10@1.15
Somerset County:				
Quemahoning	....	2.70@2.85	2.70@2.85	1.20@1.30
Medium	2.65@2.70	2.60@2.65	2.60@2.65	1.10@1.15
Latrobe	2.45@2.55	....	....	.90@1.00
Greensburg	2.75@2.80	....	....	1.10@1.15
Westmoreland	2.95@3.20	....	....	1.15@1.40
West Virginia Fairmont ¾		2.60@2.70	2.60@2.70	.80@ .90
Fairmont mine-run		2.50@2.60	2.50@2.60	.70@ .80
Steam		2.45@2.50	2.45@2.50	.90@ .95
Western Maryland		2.35@2.40	2.35@2.40	.80@ .85

Anthracite—The first half of July has shown no material improvement in the anthracite situation. Notwithstanding the continued restriction in mining there seems to be as much, if not more, of the prepared coals on hand as during the past month. There is a slight improvement in the small steam size situation due to the curtailing of production. The demand has not increased. Some of the companies are storing considerable of the smaller buckwheat coals. No improvement in operations is looked for, it being expected the mines will continue to work on about half-time schedule during this and next month. Considerable optimism is expressed as to the outlook for September.

Some of the larger shippers have received inquiries with regard to anthracite for export, a few of the inquiries having come, according to report, from England. No deals are reported as being closed.

Chestnut coal continues in abundance, much of it being in bottoms. Considerable stove and egg is in boats waiting for buyers. As a result bottoms are scarce for buyers who desire either a mixed or small cargo.

Pea coal continues about the same as last week. Inquiry for No. 1 buckwheat of the better grades has been good the prices quoted running at about $2.20. The same as regards inquiry may be said with regard to Nos. 2 and 3 buckwheat. The cheaper coals can be obtained at much lower prices.

Current quotations are about as follows:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$4.85		$4.90	
Egg	5.10	$4.80	5.15	$4.85
Stove	5.10	4.80	5.15	4.85
Chestnut	5.35	5.00	5.40	5.05
Pea	3.35@3.50	2.70@2.95	3.40@3.55	2.75@3.00
Buckwheat	2.50@2.75	2.05@2.30	2.55@2.80	2.10@2.35
Rice	2.00@2.25	1.70@1.85	2.05@2.30	1.75@1.90
Barley	1.75@2.00	1.45@1.70	1.80@2.05	1.50@1.75

PHILADELPHIA

Anthracite dull, with collections slow. Chestnut size continues a big problem. Bituminous trade inactive, although water shipments continue in large volume.

Anthracite—The strenuous efforts of the salesmen to sell coal constituted the only sign of activity in the market the past week. The dealers have no orders to give as may be imagined from the very few coal teams seen on the streets.

Prices continue well off circular on what little coal is being sold and reports are current of low prices being protected for future delivery on all sizes. One large company, long noted for the quality of its product and strict adherence to the circular, is known to have accepted orders at June prices on the last day of the month for protection over a long period.

Chestnut coal is continuing to pile up and it is absolutely impossible to move any appreciable quantity of it. One company has made arrangements to dump its large surplus at the Port Richmond piers and pay the storage charges until fall, feeling that this will be more profitable than sacrificing the coal at 40c. to 50c. per ton from the circular. There has been no improvement in the price of pea coal, the quotations running from $1.60 to $2, but the market is practically glutted and very little effort is being made by the companies to push it for this reason.

The long shut down over the Fourth of July has enabled a number of the individual shippers to release a lot of coal that had been accumulating demurrage. Despite the fact that this market is practically unable to absorb all the coal that is coming from the mines there are reports of new operations starting and which will market their product here. The Lawrence colliery is already in operation, producing 1800 tons a day and the East Bear Ridge colliery expects to start up early in August with a possible output of 1000 tons daily.

The circular prices are as follows:

	City	Tide
Broken	$3.20	$4.45
Egg	3.45	4.70
Stove	3.70	4.70
Chestnut	3.85	4.95
Pea	$2.50	$3.25
Buckwheat	1.25	2.25
Rice	.85	1.75
Barley	.50	1.50

Bituminous—The expected improvement has not as yet made itself evident, although hopes continue high, despite the fact that the market is practically at a standstill. Some shippers even complain that conditions are worse than last week. However, the ocean tonnage continues to hold up and good shipments are going to South American and European countries, particularly France, Italy and Spain. There is a fair vessel tonnage available, but owners are becoming more firm in rates, and it is reported that quite a few sailing vessels have signed up for long voyages at good figures.

Prices ruling are about as follows:

Georges Creek Big Vein	$1.65@1.75
South Fork Miller Vein	1.50@1.60
Clearfield (ordinary)	1.00@1.20
Somerset (ordinary)	1.00@1.15
West Va. Freeport	.85@ .95
Fairmont gas, mine-run	$1.15@1.25
Fairmont gas, slack	.65@ .75
Fairmont lump ordinary	.85@ .95
Fairmont mine-run	.75@ .80
Fairmont slack	.45@ .55

VESSEL CLEARANCES

The following vessels have cleared from Norfolk and Newport News, July 2 to 9, inclusive:

Norfolk

Vessel	Destination	Tons
Kayma	Rio de Janeiro	3734
Trente	Genoa	4900
Maria C.	Porto Ferrajo	4434
Selene	Italian[2]	5200
Nor. Mimer	Cienfuegos	1516
Brina Pendleton	Lisbon	1198
Coniston Water	Civita Veccha	5218
Ithaki	Catania	5434
Galveston[1]	Kingston	1585
Luigino Accame	Genoa	4314
Battinin Accame	Torre[3]	5197
Sowwell	Messina	5670
Benpark	Genoa	6219
Stromboli	Buenos Aires	7119
Tabor	Cristobal	5500

Newport News

Vessel	Destination	Tons
Hercules	Genoa	3550
Kanaris	Spezia	5300
Westmount	Santiago de Cuba	2650
E. F. Bartram	Rio de Janeiro	1625
Mongibello	Spezia	5000
Reynolds		4000
A. H. Babcock	Rio de Janeiro	2050
A. **W. Snow**	Rio de Janeiro	1000
Torridge	Rio de Janeiro	7200
Haxby		4600
Knud II	St. Lucia	2731
Ferndene	Italian port	5700

Note—Steamers are indicated by **bold face** type, others being barks and schooners.

[1] Hasler Bros., Inc. [2] Port Gib for orders. [3] Annunziata.

The following schooners cleared from New York Harbor during the month of June:

Vessel	Destination	Tons
Jessie Ashley	St. Andrews	222
F. E. Melanson	Church Point	214
Elizabeth Gilbert	Port au Prince	710
Elsie A. Bayles	St. John	531
J. A. Beckerman	Canso	589
F. C. Pendleton	St. John	638
Elma	Halifax	475
Maria Cobb	Summerside	604
C. P. Harris	Halifax	591
Minnie Slawson	St. John	575
Lavalata	Shelburne	321
A. J. Sterling	Vernon River	290
St. Bernard	Canning	215
S. E. Ludlow	Dorchester	328
Percy C.	Bridgewater	212
Isaiah K. Stetson	Charlottetown	475
Glyndon	Halifax	180
Palmetto	Clarke Harbor	190
Nepos	Guanoco	500
Flo Mader	Mahone Bay	193
Wm. D. Marvel	St. John	625
E. M. Brown	Campbellton	597
W. H. Davenport	Fredericton	342
Alcara	Halifax	199
Seth, Jr.	Halifax	422
M. V. B. Chase	St. John	735
W. L. Elkins	Fredericton	341
S. B. Halford	Halifax	601
Carrie E. Look	Halifax	780
Belliveau	New Carlisle	397
Arthur M. Gibson	Campbellton	515
Seguin	St. John	640
H. H. Chamberlain	Fredericton	359
Lucille	Annapolis	300
Scotia Queen	Bridgewater	218
American Team	Halifax	464
Crescent	Halifax	686

HAMPTON ROADS

Week's dumpings show up well both in coastwise and export. Indications are July movement will surpass June.

The dumpings over the piers at Hampton Roads for the week have been very good both as regards coastwise and export movement. Of the latter the largest percentage of the coal has been for the Italian ports. The coastwise shipments have, with few exceptions, all gone to the New England ports.

The demand for coal for export continues heavy and prices are firm. The demand for prompt movement has been such during the week that it has been almost impossible to take care of vessel tonnage as fast as it arrived in port. In a number of cases shippers are short of coal and are urging the railroads to rush shipments. There are very few shippers at Tidewater who have any great excess of coal on hand; such free coal is, in most cases, either nut and slack or high volatile. Some of the shippers have a fair amount of coal on hand but it is for contracted tonnage about due.

Railroad Tonnages—Dumpings over the local piers for the past several weeks compare as follows:

Railroad	Week Ending June 12	June 19	June 26	July 3	July 10
Norfolk & Western	197,533	207,824	213,279	211,017	174,822
Chesapeake & Ohio	89,447	71,511	79,870	83,678	76,397
Virginian	34,975	51,644	87,840	58,455	57,467
Totals	321,955	330,979	380,989	291,828	308,686

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	Nationality	To	Tons	Rate
Harlem[1]	British	Italy	2995	$9.72
Moldegaard		Havana	1788	
Farmand	Norwegian	Vita Cuba	861	
Fanny C. Bowen		Calais	892	1.35
Sommelsdyk	Dutch	Rio Janeiro	4030	
Carrie A. Lane		Porto Rico	703	
King Josiah	British	Halifax	147	2.00
Lucia Porter		St. John, N. B.	285	
Geddington Court	British	Spanish Port	2495	
Ardgarroch		Marseilles	3160	
St. Andre	French	St. Nazarre	3681	
Storfond	Norwegian	Havana	2256	
............[2]		Barcelona	7200	8.88
Strahtavon	British	Barcelona	2830	
Clumleigh	British	Barcelona		
Lonsdale	British	United Kingdom	2895	4.08
Franktor	British	United Kingdom	3059	4.08
....	British	United Kingdom	7300	3.30
Emily L. White		Bathurst		

[1]Three trips beginning July. [2]Bilbao or Cadiz.

BALTIMORE

Teresa Accame	Italian	Italy	3026	
Harmattan	British	Italy	3046	
Holtye	British	Italy	2714	
Belgier	British	Marseilles	2881	
Erinier	British	Marseilles	2820	
Linda Fell	British	Alexandria	1924	
Camilla[1]		Banes	1530	
Oosterdyk	Dutch	Italy		8.88
Campiero[2]	Brazilian	Sicily	1605	10.08
Maasdijk	Dutch	La Plata		8.28
Bruckhansen	Dutch	Tela, Honduras		
Alf	Danish	Bocas del Toro		
C. N. Simmons	American	Venezuela		
Claveresk	British	Felton, Cuba		
Chaparra	Cuban	Havana		
Urd	Norwegian	Stockholm	1968	
Maasdijk[3]	Dutch	Buenos Aires or La Plata	2935	8.28
Piemonte	Italian	Italy	3512	
Enrichetta	Italian	Italy	3088	
Caterina Accame	Italian	Italy	2504	
Eliofilo	Italian	Italy	2295	
Colomba	Italian	Italy	2238	
Gregorios Livieratos	Greek	Italy	2139	9.36
Dionyssios Stathatos[4]	Greek	Barcelona	2296	8.64
Zamora	Swedish		1959	

[1]And Preston. [2]Italy or Sicily. [3]Or Virginia. [4]Or Virginia.

VIRGINIA (INCLUDING HAMPTON ROADS)

Strathspey[1]	British	Italy	2852	9.72
Strathavon[1]	British	Italy	2830	9.27
Tiverton[1]	British	Italy	2453	9.27
E. Starr Jones		Pernambuco	787	7.75
Magnus Mansan		Pernambuco	1526	7.50
E. Starr Jones		Pernambuco	787	7.50
M. D. Cressey		Bahia	1884	
Mariteres	Spanish	Casablanca	1943	9.60
Stormount	British	Havana	1231	
Clara Davis		Brazil Port	544	
Wm. E. Litchfield		Puerto Plata	472	3.50
Dorington Court	British	Italy	3019	9.84
Eleni Stathatos	Greek	Italy	1871	9.12
Petritsis		Italy	2352	9.60
Gregorios Livieratos[2]	Greek	Italy	2139	

[1]Three trips beginning July. [2]Or Baltimore.

ATLANTIC RANGE

............[1]	American	Pacific Coast	5500[2]	5.25
............[1]	American	Pacific Coast	5500[2]	5.25
Oesterdijk	Dutch	Italy	5226	8.88

[1]Guarantee (no vessel named yet). [2]To 8000 tons.

OCEAN FREIGHTS

A number of steamers have been chartered to take coals to South American, Mediterranean and West Indian ports, and recent charters to Lower Plate ports were at $8.28, although it was claimed that others were offering $8.40 at the same time for boats of similar size, and in similar position. Four large British steamers are reported as having been chartered for three trips each, for coals to the West Coast of Italy, at $9.72, but we think this report is incorrect as we had the same boats proposed to us at $9.60 for three trips. Single charters are at considerably less than this rate, our last fixtures being at $8.64@8.88 to West Italy.

The freight market is quotable on the following basis:

To	Rate	To	Rate
Havana	$2.00@2.25	Bermuda	**$3.00**
Cardenas or Sagua	**2.75**	Vera Cruz	3.50@3.75
Cienfuegos	2.75@3.00	Tampico	3.50@3.75
Port au Spain, Trinidad	**3.50**	Rio	8.40@8.64
St. Lucia	**3.50**	Santos*	**8.64**
St. Thomas	3.00@3.25	Montevideo	**8.34**
Barbados	**3.50**	Buenos Aires or La Plata	**8.40**
Kingston	2.75@3.00	Rosario	**8.76**
Curacao	3.25@3.50	West Coast of Italy	8.64@8.88
Santiago	2.50@3.00	Barcelona**	**8.16**
Guantanamo	2.50@3.00	Valparaiso or Callao	6.25@6.50
Demerara	**4.25**	Marseilles	**8.40**

Note—Rates noted in **bold face type** are only approximate.
* Consignees paying dockage dues. **Spanish dues for account.
W. W. Battie & Co.'s Coal Trade Freight Report.

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge. 24c. per net register ton per day demurrage."

LAKE MARKET

PITTSBURGH

Market conditions hardly as favorable. Lake movement apparently decreasing. Prices unsteady but unchanged. Operations barely over 50% of capacity and there are little indications of any immediate improvement.

The holiday did not sensibly diminish the amount of coal available. Many of the mines, probably the majority, are operating only two to four days a week, so that the holiday did not reduce their week's production at all. Lake shipments have shown no improvement, and may be lighter in July than they were in June. There can be no lack of vessel room, as the ore movement down the Lakes in June exceeded that of a year ago by half a million tons, and July is expected to show a still larger gain.

There is continued call for export coal, and while the Pittsburgh district operators have been unable to take any important tonnage, some of the Connellsville operators have built up a steady trade, which is increasing and may soon exceed 10,000 tons a week. Contracts for mine-run to Apr. 1 are occasionally booked at close to $1 a ton, while on ¾-in. $1.15 is sometimes shaded. So little contract business is being done that prices are not well defined. The ordinary market for free coal is about as follows, slack not usually bringing over 45c., while Youghiogheny gas slack, not being in very liberal supply, is fairly steady at 50c.: Slack, 45@50c.; nut and slack, 90@95c.; nut, 95c.@$1; mine-run, $1@1.05; ¾-in., $1.10@1.15; 1¼-in., $1.20@1.25, per net ton at mine, Pittsburgh district. Mines are not operating at much over 50% of capacity.

BUFFALO

Dull week due partially to the holiday. Slack a very poor seller. Bad state of Canada trade. Anthracite as dull as ever. Mines running at a slow rate.

Bituminous—The demand is light and will continue so for awhile, though there are still members of the trade who state that orders are increasing. It is hard for anyone to account for the difference between this summer and that of two years ago, especially as there is so much money in the country and the export balance is so heavily in our favor.

The demand for slack is particularly light and there is considerable on track that cannot be sold. The Canadian trade is far from satisfactory; not only is it very dull, but there is every indication that it is going to remain so for awhile. Shippers estimate that not more than half the usual amount of bituminous is going over. It is figured that the extra duty and the decline in the price of Canadian coal, which is coming further west from Nova Scotia, has placed local shippers at a disadvantage of 30c. The shippers who made the prices in the spring do not intimate that there is any new basis for it, which is $2.70 for best Pittsburgh lump, $2.55 for three-quarter, $2.45 for mine-run and $2.25 for slack, with slack selling often at badly cut prices. Allegheny Valley coal remains at 25c. below Pittsburgh.

Anthracite—There is little improvement in the trade; midsummer sales are always light and they are even lighter now than the average. There appears to be a rule on the part of all sorts of consumers to buy nothing that is not needed at once. There is a falling off in Lake coal shipments for the week, the amount being only 97,725 tons, but one of the trestles has been idle part of the week to make changes in its approaches, so that may be one reason for the reduction. The movement of holiday week, however, is never up to the average.

CLEVELAND

Michigan buyers take large tonnage of No. 8 slack giving market firmer tone. Coarse coal goes begging.

Michigan buyers have taken between 500 and 1000 cars of No. 8 slack the past week at 55c. at the mines and the market is firm at that figure. Fairmount slack usually goes to the trade taking this coal. Youghiogheny and Fairmount are both up 10c. a ton. Lump coal is selling on the spot market at five to fifteen cents below quotations. There is very little demand for coarse grades and buyers are getting all they want at their own price.

The Lake trade is extremely dull. Ore shippers operating boats are trading ore cargoes for coal cargoes, ton for ton. Coal cargoes are usually traded for ore cargoes on the basis of two or three cargoes of coal for one of ore. The ore traffic is rapidly improving and shippers are independent so far as ore business for their ships is concerned.

Quotations for shipment are as follows:

	Pocahontas	Youghiogheny	Bergholz	Fairmont	Ohio No. 8
Lump	$3.45	......	......	....	......
Lump, ¾ in.	.....	$2.15	$1.90	$1.85@1.90	$1.85@1.90
Egg	3.45	......	......	....	......
Mine run	2.65	2.05@2.10	1.80	1.80	1.75@1.85
Slack	......	1.55	1.45	1.50	1.45

COLUMBUS

Trade continues rather quiet. Stocking is being done in larger volume. The small sizes are strong.

The trade has been quiet in every department. Demand for steam sizes has been limited and the same is true of the Lake trade. Stocking of domestic fuel is attracting more attention but on the whole the demand from that source is not as strong as was expected. Rural dealers are buying better to take care of the threshing trade. The tone of the market is not very good and future prospects are not bright.

In the steam trade, buying off the open market appears to be the rule. Contracts have mostly been signed up but in some cases the consumer is buying at cheap prices outside of contracts. Steam consumption is not very large and manufacturing is at a low point. The demand for railroad purposes is not increasing to any extent. On the whole the steam business is dead in most localities.

Lake trade is increasing slightly, but the larger percentage of the increase comes from West Virginia coal. Considerable tonnage is being shipped from eastern Ohio to the Northwest. From the Hocking Valley the tonnage going to the lakes is not large. Docks in the Upper Lake ports are still congested.

Retail trade is rather quiet although Pocahontas and West Virginia splints are in fair demand. White Ash and smokeless are also being bought for stocking. Hocking lump is being stocked only to a limited extent. Buying for school purposes is now attracting the attention of retailers and a considerable tonnage will be sold during the coming month. Retail prices are well maintained in Columbus, despite the business depression.

Prices in the Ohio fields are:

	Hocking	Pomeroy	Kanawha	Eastern Ohio
Rescreened lump	$1.45	$1.50		
Inch and a quarter	1.35	1.35	$1.30	
Three-quarter inch	1.25	1.30	1.25	$1.20
Nut	1.15	1.25	1.15	....
Mine-run	1.05	1.10	1.05	1.00
Nut, pea and slack	.70	.75	.65	.65
Coarse slack	.60	.70	.55	.55

Mines have been working at about the following percentage of full capacity:

District	Week Ended June 19	June 26	July 3	July 10	District	Week Ended June 19	June 26	July 3	July 10
Hocking	25	25	25	20	Cambridge	30	30	20	25
Jackson	15	20	25	15	Masillon	35	30	15	25
Pomeroy	50	45	30	45	Eastern O.	45	50	40	60
Crooksville	30	25	55	30	Average	33	32	30	31

TOLEDO

West Virginia coal still the best feature of the Toledo markets. Hopes of a more favorable rate adjustment to the Lakes.

There seems to be a little more life to the market here than for weeks past. The Lake movement is showing some improvement but is not what it should be for this season of the year. Considerable Lake coal is arriving but most of it is from West Virginia.

Local dealers express the opinion that freight rates may soon be adjusted to a more favorable basis for the Ohio mines. The Supreme Court of Ohio in a decision handed down last week confirmed the right of the State Public Utilities Commission to lower the rate on coal shipments from Nelsonville to Toledo from $1 to 85c., the Commission having made that order about five years ago on complaint by the New York Coal Co., of Columbus.

Pocahontas coal has stiffened a trifle in price and there is some demand. Hocking and all Ohio grades are extremely slow. Kentucky coal is showing some improvement and West Virginia is fairly active. Steam coal is slow in demand and dealers are holding back on stocking orders. Prices are not held very close to the list.

CINCINNATI

Business quiet although the feeling is better than for some time. Indications are that the worst is over.

The demand is almost wholly lacking. The beginning of the end of the depression seems to be at hand, although as yet it is not manifest in the shape of any actual business. The trade feels that price concessions have reached the maximum, and that even the most reckless will soon realize the futility of mortgaging the future on the basis of the present dullness.

LOUISVILLE

Retail situation slightly better but prices fluctuate over wide range. C. & O. operators invade Kentucky markets.

The retail situation is improving slightly but there is little if any change in the industrial demand. Chesapeake & Ohio operators have been able to invade the Louisville market and take a contract which heretofore had been considered the property of the eastern Kentucky companies. This is for 40,000 tons of long flame West Virginia coal for the Standard Sanitary Manufacturing Co.'s Louisville plant, to be used in the company's enameling kilns. The West Virginia shippers get a rate 5c. lower than the eastern Kentucky, and it is stated that the price was sharply cut on the coal itself. It is intimated that the Kentucky operators may lodge a complaint involving the rate.

COKE

CONNELLSVILLE

Spot furnace coke up and down again. Continued light demand for merchant coke with steadily increasing production and consumption by the steel interests.

The stiffening in spot furnace coke over the national holiday was evidently largely sentimental. Operators accumulated some surplus coke, on track, in anticipation of an extra demand, and held to higher prices until it became clear that there would be no extra demand of importance. A week before Independence Day the market moved up from $1.50 to $1.60, and later two or three sales were made at $1.75, but after the holiday the free coke was found to be in excess of the demand and the price dropped to $1.60.

There has been no negotiating on contracts. The divergence between the position of the steel works and the position of the merchant furnaces is still more pronounced. The steel trade is improving steadily, while fresh weaknesses are appearing in the merchant pig iron market, discouraging idle merchant furnaces from getting into blast. A sale of basic iron in Pittsburgh was recently made at the lowest price for years, the seller being a Lake front furnace. In consequence of these conditions the production and shipments of coke increase steadily while the demand for merchant coke, from merchant furnaces, experiences practically no increase. We quote: Prompt furnace, $1.60; contract furnace to Jan. 1, $1.75; prompt foundry, $2@2.50; contract foundry, $2.20@2.50, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended July 3 at 371,414 tons, an increase of 15,936 tons, and shipments at 376,957 tons, an increase of 30,580 tons. These increases were doubtless due largely to anticipation of the holiday.

Buffalo—There is a continuation of increased output of coke and some of the shippers are asking an advance in prices. The prospect is that if the stir continues there will be better business all along the line, but some members of the trade decline to report anything better than a larger tonnage, though they are aware that if the increase continues there will have to be an advance. From Pittsburgh comes the report that steel is more active, so there is at least a prospect of an end to the long period of dullness. Quotations are firmer on the basis of $4.15 for best 72-hr. Connellsville foundry and $2.20 for stock coke.

Chicago—Byproduct coke has been in good demand at firm prices, and foundry coke seems to gain momentum slowly. Prices are as follows: Byproduct, $4.65@5.10; Connellsville, $4.75@5; Wise County, $4.75; gas coke, $3.75@4.90, furnace, $4.75.

MIDDLE WESTERN

GENERAL REVIEW

Sales of Indiana and Illinois coals increasing perceptibly. Eastern grades not quite so active. Screenings show further declines. Anthracite business light.

There is no rush in the buying movement, but it makes slow and steady advances. July so far shows an increase over the June demand, and shippers expect a rush of orders toward the end of July or early in August. The weak spots in the market have been reduced to a minimum. Although storage orders are beginning to appear, a waiting attitude is still noted at most of the retail yards both in the city and country, and also among large consumers, but it is felt that this indifference is bound to quicken into activity before many weeks pass.

Indiana and Illinois shippers are now strongly urging the trade to stock up immediately while transportation facilities are favorable for furnishing prompt delivery and prices are low, but so far this has not been acted upon by most buyers. The tendency is to operate the mines only sufficient to cover orders already received, keeping prices well in hand, and shipping no consignment coal.

Interviews with the more important of operators show the unanimous feeling that future prospects look bright. This opinion is not based on any visible increased volume of business, but is rather the result of the coöperative spirit which now pervades the Western territory. This is largely due to joint selling plans which are now working with a larger degree of success in Indiana, the Springfield district, among the Franklin and Williamson County operators, and the Standard field south of East St. Louis.

INDIANAPOLIS

Heavy storms interrupt the movement. Threshing and school demand opening up. Gary mills on full time.

The heaviest July rain in 41 years of the weather bureau service in this state, washed away some sections of main lines of railroads and several mine switches, interfering to some extent with mine operations and retarding the movement of cars. The Monon was apparently the worst sufferer.

Otherwise the Indiana coal situation is not much changed. The screenings market has recovered from its recent tendency to weaken and is now firm at 80 to 85c. f.o.b. mines. There is only light demand for domestic lump, the supply of slack coming mainly from 1¼-in. railroad business. The threshing demand has begun to take some of the best domestic lump and during the latter part of the month and through August, the school boards of the state will also be purchasers of this grade.

The industries are showing no marked increase in activity, but they are absorbing the current restricted output. The plants of the Illinois Steel Co. at Gary are in full operation for the first time since 1912. Some of the larger coal mines are also reported on full time and others are operating three to four days a week. Retail yards have still their summer schedule of prices.

CHICAGO

Price advances have stimulated more orders. Outlook in Springfield district more encouraging than for a long time. Market for Indiana grades expanding.

The advance in prices of Franklin County coals stimulated orders, mostly from retail dealers. Domestic sizes have been moving fairly well with few or no orders for steam sizes, and screenings have declined about 10c. per ton since last week. Williamson County operators are also receiving increased orders at the advanced prices, and have shipped a considerable volume of coal at list figures to Northwestern points.

Some of the Saline and Harrisburg County operators have also made an advance of 15c. per ton on domestic sizes, but the increased production of lump has resulted in an excess quantity of fine coal, the price on which has eased off to about 75c. per ton. The mines have averaged in operating time one day more than last week.

A fair amount of orders have been received by the Springfield operators at the higher prices which went into effect on the first of the month and the situation has been more encouraging than for many months past. Screenings are easier. There has been a small increase in the movement of railroad coal from this district.

Several Chicago retail yards have placed contracts for Indiana domestic 4-in. lump, and it is reported the prices are around $1.50 for the entire season's requirements. The market for this grade has expanded, and very little has been sold during the past week below $1.35.

Smokeless coals are not so strong, and egg has been offered recently below list prices. Shipments are also coming forward more promptly, which has had a disquieting effect on the trade. Pocahontas mine run prices are well held, and average around $1.10 to $1.25 per ton. A slight advance in the demand for splint for steam purposes is noted.

The prices on Kentucky coals are not attractive, and still continue most variable. Quite a tonnage of fine coal is reported moving to northern Indiana points under contract for steam purposes.

Increased orders for stocking have been received by Hocking shippers, and prices are firm. Movement of Hocking for Lake delivery is very slow.

Quotations in the Chicago market are as follows:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump......	$1.35@1.50	$1.25@1.50	$1.35@1.50	$1.35@1.50	$1.40@1.50
Steam lump	....	1.15@1.25	1.10@1.15	1.15@1.25	1.20@1.30
2½-in. lump.	1.25	....	1.25@1.35	1.10@1.25	1.30
1½-in. lump.	....	1.25	1.20@1.25	1.10@1.20	....
Egg.......	1.35@1.50	1.25@1.35	1.15@1.25	1.10@1.15	1.15@1.25
Nut.......	1.25@1.35	1.10@1.25	1.00@1.10	.95@1.05	1.00@1.05
No.1washed	1.35@1.50	....	1.50@1.60	....	....
No.2washed	1.25@1.35	....	1.40	....	....
No. 1 nut..	1.35@1.50	....	....	....	....
No. 2 nut..	1.25@1.35	....	....	....	....
Mine-run...	1.15@1.25	1.00@1.10	.85@1.00	.90@1.00	.85@1.05
Screenings..	.75@ .85	.70@ .80	.65@ .75	.70@ .75	.70@ .80

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump......	$1.25@1.50	$1.35@1.60	$1.90@2.00	$1.35@1.60	$1.35@1.50
1½-in. lump.	1.10@1.25	1.25@1.50	....	1.10@1.25	1.25@1.35
Egg.......	1.25@1.50	1.10@1.35	1.75@1.90	1.35@1.50	....
Nut.......	....	.90@1.15	1.40@1.60	1.25@1.35	1.15@1.25
No. 1 nut..	1.25@1.35	....	....	....	....
No. 2 nut..	1.25@1.35	..	....	....	....
Mine-run...	1.10@1.15	1.00@1.10	1.10@1.25	1.10@1.25	1.25
Screenings..	.75@ .80	.65@ .80	....	....	....

Receipts by Lake—Arrivals by Lake for the week to July 12 and for the month and season to date were as follows:

Chicago

Vessel	From	Tons
L. C. Smith	Buffalo	6893
Neptune	Buffalo	5150
John A. Donaldson	Ashtabula	6144
John Crerar	Oswego	2207
Albert M. Marshall	Oswego	2205
Lupus	Buffalo	5700
H. G. Dalton	Oswego	2188
Geo. C. Howe	Oswego	2247
G. J. Grammer	Ashtabula	6700
Indus	Buffalo	5800
Total......................		45,234

Note—Tonnages noted in **full face** type are bituminous, all others being anthracite.

South Chicago

Vessel	From	Tons
Wilkesbarre	Buffalo	6,083
John Stanton	Cleveland	**10,067**
F. J. Durston	Buffalo	7,624
Goegebic	Cleveland	**2,500**
Harold B. Nye	Toledo	**6,338**
		13,707
		18,905

Totals for July and the Season

	1915	1914
Buffalo	37,250	31,930
Oswego	8,847	4,577
Ashtabula	12,844	7,200
Cleveland	**12,567**	
Toledo	**6,338**	**9,160**
Sandusky		9,411
Total, July	58,941	43,707
Total, season	317,187	214,960
Total, July	**18,905**	**18,571**
Total, season	182,425	274,987

ST. LOUIS

Larger movement than for some time and prices better. Orders continue scarce, but more inquiries are coming in from retail trade.

The unchanged prices which have prevailed for several weeks are giving way to fluctuations here and there which encourage coal men to anticipate an improvement in the near future. Following the breaking of the deadlock among the Standard operators last week, there have been a number of changes in prices. Although the orders have not been large there has been a heavier movement during the past week than at any time since the beginning of the dull summer period.

On Williamson and Franklin washed the prevailing price for No. 1 has been $1.30 and for No. 2 $1.20 in the city but the list in the country has been $1.35 for No. 1 and $1.50 for No. 2. The demand for lump and egg has been stronger. There are more inquiries at city yards and domestic business is beginning to move. There is a perceptible strengthening of high-grade coal both in the city and the country.

	Wilm. & Frnk. Co.	Sparta	Mt. Olive	Standard
6-in. lump....................	$1.25@1.35	$1.25	$1.35	$0.95
2-in. lump....................	....	.95	1.25	.85
3-in. lump....................	....	....	1.25	....
3x6 egg....................	1.25@1.35	....	....	.80
No. 1 nut....................	1.30@1.35	....	....	....
No. 2 nut....................	1.15@1.25	....	.	....
No. 1 washed................	1.30	....	1.50	....
No. 2 washed................	1.20	....	....	....
No. 3 washed................	1.20	....	....	....
No. 4 washed................	1.15	....	....	....
No. 5 washed................	.80	....	....	....
Screenings....................	.70@ .80	.80	....	.80

PRODUCTION AND TRANSPORTATION STATISTICS

CHESAPEAKE & OHIO RY.

The following is a comparative statement of the coal and coke traffic from the New River, Kanawha and Kentucky districts for May and the eleven months of the fiscal years 1914 and 1915, in short tons:

	May				Eleven Months			
Destination	1915	%	1914	%	1915	%	1914	%
Tidewater.....	429,466	22	298,180	17	3,468,015	18	3,238,342	19
East..........	168,463	9	187,432	10	2,212,044	12	2,389,123	14
West..........	1,184,105	62	1,224,767	67	12,343,472	65	10,361,424	61
Total.......	1,782,034		1,710,379		18,023,531		15,988,889	
From Connections								
Bituminous....	129,281	7	110,632	6	1,061,176	5	1,034,622	6
Anthra. (local).	99				751			
Anthracite.....	1,268		1,270		13,179		14,594	
Total.........	1,912,682	100	1,822,281	100	19,098,824	100	17,038,105	100
Coke...........	21,803		31,040		178,220		359,360	

THE CAR SITUATION

Statistical statement No. 6 of the American Railway Association shows the gross shortage of idle railroad cars of all kinds on July 1 to be 785, which compares with 218 on June 1, and 1333 on July 1 of last year. The gross surplus of coal and gondola cars on June 1 was 83,726, and the shortage 185.

MIDDLE WESTERN MOVEMENT

Bituminous coal forwarded from Indiana and Illinois mines over 17 principal railroads from April, 1914, to March, 1915, inclusive, was as follows, in short tons:

Illinois Central RR......	7,329,826	Southern Railway.......	1,202,623
C. & E. I. RR...........	6,270,987	B. & O. S. W. RR.......	901,708
C. B. & Q. RR..........	5,520,764	St. L. T. & E. RR.......	691,429
C. C. C. & St. L. Ry....	4,907,103	St. L. & O. F. Ry.......	561,616
Vandalia RR............	4,526,118	L. & M. Ry............	557,527
C. T. H. & S. E. Ry.. ..	2,930,604	C. I. & L. Ry...........	492,505
C. & A. RR......... .	1,776,057	C. P. & St. L. Ry.......	384,642
Wabash RR............	1,581,294	C. & N. W. Ry.........	361,919
St. L. I. M. & S. Ry... .	1,472,574		

COAL DIVIDENDS

The following are some of the more important dividends recently announced:

Lehigh & Wilkes-Barre Coal Co.—Dividend of $3.25 payable June 28 to holders of record June 17.

Texas & Pacific Coal Co.—Regular quarterly dividend of 1½% payable June 30 to holders of record June 20.

Pacific Coast Co.—Regular quarterly dividend on both the common and second preferred of 1% and 1¼% on the first preferred, all payable May 1 to holders of record Apr. 27.

Elkhorn Fuel Co.—Dividend of 1¼% on the preferred payable May 10 to holders of record May 1.

Lehigh Coal & Navigation Co.—Regular quarterly dividend No. 146 of $1 payable May 29 to holders of record Apr. 30. The transfer books do not close for this dividend.

New Central Coal—Dividend of 1% payable May 1 to holders of record Apr. 28.

Central Coal & Coke—Regular quarterly dividend on the preferred of 1¾%, payable July 1 to holders of record July 1 to July 15.

Island Creek Coal Co.—Regular quarterly dividend on the common of 50c. payable Aug. 1 and $1.50 on the preferred payable July 1, to holders of record July 23 and June 23, respectively.

Temple Coal Co.—Regular quarterly dividend of 2%, payable July 12 to holders of record July 2.

United Fuel Supply Co.—Regular quarterly dividend of 2%, payable June 21 to holders of record June 10 to June 21.

Alabama Fuel & Iron Co.—Regular quarterly dividend of 1%, payable to holders of record June 22 to June 30.

Lehigh Coal & Navigation Co.—Regular quarterly dividend of $1, payable Aug. 31 to holders of record July 31.

Lehigh Valley Coal Sales—Regular quarterly dividend of $1.25, payable July 17 to holders of record July 8.

Pittsburgh Coal Co.—Regular quarterly dividend on the preferred of 1¼%, payable July 24 to holders of record July 15.

FOREIGN MARKETS

GREAT BRITAIN

Interest centered on the labor unrest. An acute situation narrowly averted.

July 2—Interest regarding coal trade matters during the past week has been very largely concentrated upon the negotiations in South Wales, and the news that a basis for the amicable settlement of the questions in dispute had been arrived at by the intervention of the Government was received with a feeling of relief, although the narrow margin by which the proposals were agreed to shows how near we were to a strike which might have vitally affected the first line of defense. It seems almost incredible that at such a time as this as many as 112 men could have been found to vote in favor of such a disastrous course, for that is what their action virtually amounted to, and in view of this formidable opposition it is by no means certain that an amicable settlement will be arrived at without great difficulty. With regard to the labor situation generally much seems to be hoped from the conference in London next week; but the attitude of the miners generally in the present crisis is by no means reassuring, although it is possible that some arrangement for an increase of the output may yet be arranged.—"The Iron and Coal Trades Review."

July 2—Owing to labor troubles the market is in a very unsettled condition. Stocks of coal continue heavy and for immediate loading buyers could secure substantial concessions. For forward loading colliery owners are not disposed to quote in view of the unsettled labor situation. Quotations are approximately as follows:

Best Welsh steam.......	Nominal	Best Monmouthshires....	$6.24@6.48
Best seconds............	Nominal	Seconds................	5.76@6 00
Seconds................	$6.24@6.72	Best Cardiff smalls......	4.68@4.80
Best dry coals..........	6.24@6.48	Cargo smalls...........	3.60@3.84

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—Outward chartering is on quiet lines, owing to the unsettled labor situation. Rates are approximately as follows:

Gibraltar.........	$3.84	Naples..........	$5 64	St. Vincent.......	$4.80
Marseilles........	4.83	Alexandria.......	6 24	Rio de Janeiro....	6.36
Algiers...........	4.54	Port Said........	6 24	Monte Video.....	5.76
Genoa...........	5.52	Las Palmas......	4.56	River Plate......	6.00

Later—Under date of July 15 the "Daily Chronicle" says: The outlook in South Wales is distinctly grave. The executive body of the South Wales Miners' Federation appears to be hopelessly divided, and a new conference of delegates has been summoned by telegram, to take place today. No instructions, however, have been issued by the executive body canceling the orders to the men to strike today, and it is considered almost certain, therefore, that a large part of the coal field will be idle today. This is despite the proclamation placing the dispute under the Munitions act, under which any striker becomes liable to a penalty of $25 a day.

CONTRACT NOTES

Meridian, Miss.—Contract for coal for the County of Lauderdale has been awarded to Carleton Hawkins.

Middletown, Del.—The Light & Water Commission at this place has awarded the contract for furnishing coal during the ensuing year to **Jesse L. Shepherd** at $3.20 per ton.

Buffalo, N. Y.—Receipts of iron ore by Lake are heavy, being 625,341 tons for June and 997,600 tons for the season to July, as against 733,393 tons to the same date last season. The shipments out are in excess of receipts.

Brazil—An American consular officer in Brazil transmits the name and address of the representative of a firm of engineers in his district, who desires to enter into commercial relations with American exporters of coal. References are given.

Salt Lake City, Utah—The Board of Education at this place purchases about 6000 tons of bituminous slack per annum. The call for bids is usually advertised and the business done on a competitive basis. Bids are required to cover cost of delivery to the buildings. Address Clk., L. P. Judd, Bd. of Edu. Salt Lake City, Utah.

+**New Ulm, Minn.**—The city contract for the year ending May 15, 1916, was awarded to **Bingham Bros.** of this city. Nine other firms entered bids for this business. The bid of Bingham Bros. on Pyrolite coal mined at Benton, Franklin County, Ill., was $3.37½ per ton for 2-in. screenings and $4.20 per ton for Youghiogheny screenings, was accepted by the council.

Hampton Roads, Va.—For quick loading the Chesapeake & Ohio Ry. has again made a record when on June 28 there was loaded by this road into the collier "Cyclops" 11,592 tons of cargo and bunker coal in the short space of 5 hr. 15 min. Previous to the loading of the "Cyclops" the record for fast loading of these government colliers was held by the Virginian Ry., which on June 26 loaded into the collier "Jupiter" 11,535 tons in 9½ hr.

Coal Prices at Panama—The Canal authorities give notice that on and after Sept. 1, 1915, the following prices will obtain at the Panama Canal for coal supplied steamships, including warships of all nations: Cristobal and Colon—Delivered alongside of vessel in lighters or in cars on the wharves, trimmed in bunkers, when handled by ship's gear (per ton), $6. Balboa—Delivered alongside of vessel in lighters or in cars on the wharves, trimmed in bunkers, when handled by ship's gear (per ton), $7. An additional charge of $1 per hour will be made for the use of each mechanical hoist or crane furnished by the Panama R.R. Co.

Anthracite State Tax—The P. & R. Coal & Iron Co. state they have no fear of the probe into the increase of coal prices due to the imposition of the anthracite tax passed by the legislature two years ago. The legislature recently adjourned have authorized an investigation into the increase of retail prices, but the officials state that while the retail price may have been increased 25c. per ton they have only added the tax to their usual price, which does not amount to 10c. per ton at the maximum. It has been the practice of this company to render their bills with the tax shown as a separate item and in the event that a refund should ever be required, their customers will have no difficulty in ascertaining the amount due them.

Boston—Recent enactment in Massachusetts of legislation designed to forbid the New Haven's buying coal from any corporation having a director who "interlocks" with that railroad makes interesting the fact that it has recently negotiated another contract with New England Coal & Coke Co. The New Haven's annual purchase of coal from this company is understood to be in the vicinity of 400,000 tons. Within a fortnight this coal company has retired from its board four directors who are on Massachusetts railroad directorates. There are two other big contracts included in the New Haven's coal supply. One is with Keystone Coal Co., which, after Agent Mellen, a son of former President Mellen of the railroad, had resigned under pressure from the transportation interests, secured a renewal of the sales-contract as of July 1 last. Another contract, running for five years to August, 1916, is with Virginia Iron, Coal & Coke Co., which has a contract also with the Boston & Maine. The recent Massachusetts legislation purports to require that Henry K. McHarg be out of the directorate of either that company or the New Haven before either the New Haven or the Boston & Maine can again buy coal from the Virginia Co. "Boston News Bureau"—(For additional notes on this contract see Vol. 7, p. 1088).

Pittsburgh, Penn.—The United States Engineers Office, opened bids June 21 for coal required for the operation of locks on the Monongahela and Ohio Rivers and work tributary thereto for the fiscal year ending June 30, 1916, then awarded contracts as follows: **Clyde Coal Co.,** nut and slack for Locks Nos. 1 to 5, Monongahela River, 3.9c. per bu.; nut and slack for Lock No. 6, Monongahela River, 3.95c., delivered in flats. **W. Harry Brown,** mine-run for Locks Nos. 1 to 5, Monongahela River, 4.75c.; mine-run for Lock No. 6, Monongahela River, 4.50c., delivered in flats. **C. F. Reed,** Charleroi; nut for Lock No. 4, Monongahela River, 5.5c., delivered by wagon. **Consumers Coal Co.;** mine-run for Lock No. 4, Monongahela River, 5.87c., delivered by wagon. **Clyde Coal Co.;** nut at 4.25c. and mine-run at 5.25c. for Lock No. 1, Ohio River, delivered in flats; nut and slack, 5.50c.; mine-run, 6.50c., for Lock No. 7, Ohio River, delivered in flats; nut and slack, 4.18c.; mine-run, 3.8c., delivered to steamers at tipples or in harbor; nut and slack, 4.25c.; mine-run, 5.25c., delivered in flats at Point Bridge landing. **Pittsburgh Coal Co.;** mine-run, $1.50 per net ton, for Lock No. 1, Ohio River, delivered by rail. **Moreland Coke Co.;** mine-run; $1.63 for Locks Nos. 4, 5 and 6, Ohio River; $1.64½ for Lock No. 7, Ohio River, Midland, Penn.; $1.39½ for Lock No. 8, Ohio River, Kenilworth, W. Va.; $1.39½ for Lock No. 9, Ohio River, New Cumberland, W. Va.; $1.24½ for Lock No. 10, Ohio River, Steubenville, Ohio. **Pittsburgh Coal Co.;** mine-run, $1.20, for Lock No. 3, Monongahela river, Elizabeth, Penn.

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

For the official advertisements of bids wanted see the Contracts-to-Be-Let Section on Page 18.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

No. 854—Tompkinsville, N. Y.—Proposals on this contract (Vol. 7, p. 1085), which provide for furnishing the Lighthouse Service with bituminous and anthracite coal at New York, New London, Conn., and Newport, R. I., will be received until 2 p.m., July 28. Blank proposals and further particulars may be obtained on application. Address Lighthouse Inspector, Tompkinsville, N. Y.

No. 875—Idaho Springs, Colo.—The Boston-Colorado Power & Water Co. advises that this contract (Vol. 7, p. 1086), which provides for furnishing the company with approximately 3500 tons of slack coal, will probably not be negotiated until some time in September. Address Pur. Agt., Boston-Colorado Power & Water Co., Idaho Springs, Colo.

No. 895—Monticello, Ind.—Bids were received on this contract (Vol. 7, p. 1086), which provides for furnishing the Court House, Jail, and County Asylum with coal from the following companies: G. A. Kellinburgh; Central States Bridge Co., Rochester Bridge Co., Elkhart Bridge Co., F. M. Williams. Address Audr. A. G. Fisher, Bd. of County Comrs. Monticello, Ind.

No. 918—Kansas City, Mo.—This contract (Vol. 7, p. 1127), which provides for furnishing the local Water Department City Hall, Hospitals, etc., with approximately 25,000 tons of coal, will be let some time during the current month. Address City Pur. Agt. John P. Langan, City Hall, Kansas City, Mo.

No. 935—New York, N. Y.—Bids on this contract (Vol. 7, p. 1127), which provides for furnishing and delivering 2000 gross tons of No. 2 buckwheat to the Department of Docks and Ferries, were as follows: C. D. Norton & Co., $2.18; Pattison & Bowns, $2.14; George D. Harris & Co., $2.26; Gavin Rowe, $2.21; Clarksburg Coal Mining Co., $1.94. Address Commissioner of Docks and Ferries, R. A. C. Smith, Pier "A", Battery Place, New York City.

No. 991—Storrs, Conn.—Sealed bids will be received until noon, July 20, for furnishing the Connecticut Agricultural College with coal (p. 76). Separate bids should be submitted on each size. Address Connecticut Agricultural College, Storrs, Conn.

New Business

+1023—Wynne, Ark.—The Wynne Light & Water-Works at this place consumes about 1200 tons of Kentucky bituminous coal per annum. The contracts are generally let in August and the approximate cost is $3.35 per ton. The business is let on competitive bids. Address Purchasing Agent, Wynne Light & Water-Works, Wynne, Ark.

1024—Kansas City, Mo.—The Kansas City Stock Yards Co., one of the larger consumers of coal in this district, buys entirely in the open market. It consumes from three to five cars per week. Address Purchasing Agent, Kansas City Stock Yards Co., Kansas City, Mo.

+1025—Joliet, Ill.—The Illinois State Penitentiary will receive sealed bids until 10 a.m., July 31, for furnishing its annual coal requirements, estimated at approximately 20,000 tons. Bids are requested on mine-run and 1½-in. screenings. All proposals must be accompanied by a certified check for $200. Bids must be submitted on blanks which may be obtained on application. The contract is to run during the fiscal year beginning Aug. 2. Address Secy. Charles W. Faltz, Comr. of Illinois State Penitentiary, Joliet, Ill.

1026—Kansas City, Mo.—Smith, McCord & Townsend are said to be considering a contract for furnishing the fuel required in their wholesale dry goods business. About 150 tons will be bought. Address Pres. Leon Smith, Smith, McCord & Townsend, Kansas City, Mo.

+1027—Rapids City, S. D.—The Independent School District of this place will receive bids until noon, July 27, for furnishing approximately 200 tons of coal. Bids should include cost of delivery to the various school buildings as required. Address Secy. W. F. Haafke, Independent School District, Rapids City, S. D.

1028—Kansas City, Mo.—The Rossington Hotel is said to be considering contracting for about 250 tons of Cherokee slack and nut coal some time during the current month. Address Purchasing Agent, the Rossington Hotel, Troost and 30th St., Kansas City, Mo.

1029—Kansas City, Mo.—The local branch of the Cudahy Packing Co. is in the market for its annual supply of coal, involving about 190 tons of Cherokee slack per day. Address Purchasing Agent, Cudahy Packing Co., Kansas City, Mo.

1030—Kansas City, Mo.—Spalding's Commercial College, using 10 cars of soft coal a month, will let its contract about Aug. 1. Address Pres. J. F. Spalding, Tenth and Oak St., Kansas City, Mo.

1031—Kansas City, Mo.—The local branch of the Ford Motor Co. will let its annual fuel contract some time during the current month. It consumes about two carloads of slack coal per month. Address Purchasing Agent, Ford Motor Co., 11th and Winchester Ave., Kansas City, Mo.

+1032—Cleveland, Ohio—The Board of Education at this place will receive bids until noon, Aug. 2, for furnishing its annual fuel requirements during the ensuing year, about as follows: Anthracite, 300 tons; bituminous lump, 3000 tons; bituminous nut, 2500 tons; bituminous slack, 25,000 tons; semibituminous mine-run, 4000 tons; semibituminous lump, 4000 tons. All proposals must be accompanied by a surety bond for $2500, and the bidder must be prepared to enter into a contract within five days of receipt of notice. Specifications may be obtained on application, and all proposals must be submitted on blanks prepared for that purpose. The successful bidder will be required to furnish a corporate surety bond for 50% of the estimated amount of the contract. Address Dir. of Schools F. C. Hogen, School Headquarters, Rockwell Ave. and East Sixth St., Cleveland, Ohio.

1033—Kansas City, Mo.—The Cochrane Packing Co. at this place, which buys its coal in the open market, is said to be considering entering into a contract. It consumes about two cars of mine-run per month. Address Treas. C. E. Rowett, Cochrane Packing Co., Kansas City, Mo.

+1034—Youngstown, Ohio—The Board of Education at this place will contract some time in August for its annual requirements of coal, involving about 5000 tons of Pittsburgh lump. The current contract is being filled at $2.80 per ton. The call for bids is advertised. Address Board of Education, Youngstown, Ohio.

+1035—Pueblo, Colo.—School District No. 1 at this place usually contracts some time in August for its annual requirements of coal, amounting to about 1500 tons. The present contract is being filled with steam slack, which is costing $2.25 per ton. In addition to this contract there is another School District No. 20 which is not included in this. Address Secy. E. J. Scott, School Dist. No. 1, Pueblo, Colo.

1036—Kansas City, Mo.—The Frankel Frank Co. at this place usually contracts for its annual requirements of coal some time during the current month. It requires about 200 tons of bituminous coal. Address Purchasing Agent, Frankel Frank Co., 10th St. and Broadway, Kansas City, Mo.

+1037—Springfield, Ohio—The County Commissioners will receive bids until 10 a.m., July 22, for furnishing approximately 800 tons of bituminous coal. One-half is to be delivered to the County Infirmary and the balance to the Court House. Address County Commissioners, Springfield, Ohio.

1038—Kansas City, Mo.—Hugh Mathews, who has been buying the coal required at his machine shop in the open market, is said to be considering entering into a contract during the ensuing year. About 250 tons of lump and slack will be required. Address Hugh Mathews, Fifth and Washington St., Kansas City, Mo.

+1039—Kansas City, Mo.—The Butler Manufacturing Co. at this place will be in the market some time during the current month for about five cars of Cherokee nut coal. Address Asst. Supt. Fred. A. Rufi, 13th St. and Eastern Ave., Centropolis, Kansas City, Mo.

+1040—East Tawas, Mich.—The local Water and Light Department will be in the market some time next month for about 1300 tons of steam lump coal, which is usually bought at approximately $3.10 per ton. It is understood that the business is not let on competitive bids. Address City Clk. Alfred J. Noel, East Tawas, Mich.

+1041 — Yonkers, N. Y. — The Board of Education received sealed bids until 8 p.m., July 16 for furnishing approximately 3000 tons of free burning white ash anthracite. Egg coal was specified almost exclusively the only other sizes being 550 tons of pea and less than 100 tons of nut. Address Secretary Board of Education, Yonkers, N. Y.

1042—Ionia, Mich.—The warden of the Michigan Reformatory at this point will advertise next month for bids covering the 4000 tons of mine-run coal required by the reformatory for the season. The warden reports that bids will not be considered until that time. Address Warden Otis Fuller, Michigan Reformatory, Ionia, Mich.

1043—Chicago, Ill.—L. A. Budlong Co. will be in the market about Aug. 15 for approximately 12 cars West Virginia splint egg. Address Purchasing Agent, L. A. Budlong Co., Chicago, Ill.

1044—Kansas City, Mo.—The Sewell Paint & Glass Co. will contract during August for its year's supply of coal, amounting to about 35 tons of nut per month. Address Purchasing Agent, Sewell Paint & Glass Co., Kansas City, Mo.

+1045—Decatur, Ill.—The Board of Education at this place generally contracts in August for its annual requirements of coal, involving about 3845 tons of mine-run and 1¼-in. screened nut. The nut coal is usually bought at $2 per ton and the mine-run at $2.20. The call for bids is advertised. Address J. F. Roach, Bd. of Edu., High School, Decatur, Ill.

+1046—Two Harbors, Minn.—The Light and Water Department at this place generally contracts in either August or September for its annual requirements of coal, involving about 5000 tons of bituminous and 1200 tons of anthracite. The bituminous is usually bought at approximately $2.82 per ton and the anthracite (nut coal) at $6.47. The business is let on competitive bids. Address Light and Water Dept., Two Harbors, Minn.

1047—Kansas City, Mo.—William Volker & Co. will buy four cars of soft coal during the month of August. Address Purchasing Agent, William Volker & Co., Main and Second St., Kansas City, Mo.

1048—Middletown, Ohio—The Colin Gardner Paper Co. will be in the market for its annual coal supply on Aug. 15. Its normal requirements aggregate about 50,000 tons of nut and slack stoker coal. Deliveries are to be made in about equal weekly installments as specified and must be in hopper-bottom cars and delivered over the Big Four Ry. A grade of coal that will run satisfactorily over Murphy stokers, and particularly one that will not clinker, is required. Address Asst. Treas. M. S. Johnston, the Colin Gardner Paper Co., Middletown, Ohio.

+1049—Sioux City, Iowa—The Board of Education at this place will contract some time in August for its annual requirements of coal, involving about 2500 tons. "Purity" steam coal is being used on the present contract, for which $3.93 per ton is being paid. Address Purchasing Committee, Board of Education, Sioux City, Iowa.

1050—Kansas City, Mo.—Baker & Lockwood will let a contract about Aug. 1 for six cars of semianthracite slack and Cherokee nut. Its plant is located at the corner of Wyandotte and Sixth St. Address Pur. Agt. C. R. Summerville, Baker & Lockwood, Wyandotte and Sixth St., Kansas City, Mo.

+1051—Zanesville, Ohio—The Board of Education here usually contracts during August for its annual requirements of coal, involving about 1350 tons of mine-run. Bids are requested by letter. The usual price is about $2 per ton. Address Clk. C. J. Weaver, Bd. of Edu., Zanesville, Ohio.

+1052—Savannah, Ga.—The Board of Education at this place will purchase about 275 tons of anthracite some time in August. The call for bids is advertised and the business is done with local dealers. Address Committee on Supplies, Board of Education, Savannah, Ga.

1053—Kansas City, Mo.—The McPike Drug Co. will contract during the latter part of August for its yearly supply of slack, of which it uses about eight tons per day. Address Pres. W. T. Bland, McPike Drug Co., Central and Seventh St., Kansas City, Mo.

+1054—Ottumwa, Iowa—The School Board here will contract some time next month for about 1600 tons of screened lump coal, which is usually bought at $2.70. The call for bids is advertised. Address School Board, Ottumwa, Iowa.

+1055—Grand Island, Neb.—The Water and Light Commission at this place usually contracts some time in August for about 400 tons of coal. The business is let on competitive bids and usually goes at about $4 per ton. Wier City nut coal is being used on the present contract. Address J. H. Miller, Water and Light Dept., Grand Island, Neb.

1056—Kansas City, Mo.—The Gillpatrick Laundry Co. will let its coal contract during the month of August. It uses about 100 tons of slack coal per month. Address Purchasing Agent, Gillpatrick Laundry Co., Vine and 15th St., Kansas City, Mo.

+1057—Superior, Wis.—The Board of Education will contract some time in August for its annual supply of coal, involving about 2500 tons of lignite. The call for bids is advertised and the customary price is about $2.80 per ton. Address Board of Education, Superior, Wis.

+1058—Plymouth, Mass.—The County Commissioners at this place received bids until 9:30 a.m., July 13, for the coal required during the year ending July 1, 1916. About 400 tons of egg coal is required, to be delivered f.o.b. cars or wharf at Plymouth, probably at the rate of two carloads at a time, and 100 tons of Pocahontas, Cumberland, Georges Creek coal, to be delivered at the Court House at Brockton, probably at the rate of one carload at a time. Address County Comr. Lyman P. Thomas, Plymouth, Mass.

+1059—Toledo, Ohio—The Board of County Commissioners will receive sealed bids until 10 a.m., Aug. 10, for furnishing the coal required during the fiscal year beginning Aug. 17 at the Lucas County Court House, Armory and Power House. Deliveries are to be made as required, and all bids must be accompanied by a certified check for $100. Bids will also be received at the same time for furnishing the coal required at the Lucas County Infirmary during the same period. Bids on this last item should be made f.o.b. cars on railroad siding at Infirmary, and must be accompanied by a certified check for $100. Address Audr. Charles J. Sanzenbacher, Lucas County, Toledo, Ohio.

1060—Louisville, Ky.—B. F. Avery & Sons will issue specifications about July 20 for a six months' supply of nut and slack coal. About 75 cars will be required altogether, and deliveries will be at the rate of three cars per week beginning Oct. 1. Address Purchasing Agent, B. F. Avery & Sons, Louisville, Ky.

+1061—Mason City, Iowa—Bids were received until 11 a.m., July 12, for furnishing the Court House, County Farm and Hospital with about 1800 tons of coal during the ensuing year. Bids on the requirements for the Court House were to include cost of delivery in the bins, and those for the County Farm and Hospital were f.o.b. cars at Emery. Address County Audr. George E. Frost, Mason City, Iowa.

1062—Kansas City, Mo.—The Faultless Starch Co., 1025-27 East Eighth St., will be in the market for about 150 tons of soft coal during the month of August. Address Pres. J. G. Beecham, Faultless Starch Co., 1025-27 East Eighth St., Kansas City, Mo.

+1063—South Framingham, Mass.—Sealed bids were received by the Board of Education at this place for furnishing approximately 700 tons of bituminous and anthracite coal to be delivered at the local school buildings between Aug. 1 and May 1. Address Superintendent of Schools, Board of Education, South Framingham, Mass.

+1064—Joliet, Ill.—The City Council received bids until July 12 for supplying coal as follows: Best Illinois or Indiana mine-run for use at the Washington St. plant of the city water-works; 225 tons best Illinois mine-run and 100 tons of Pocahontas to be delivered as required for the Fire and Police Department; eight carloads southern Illinois 6-in. lump f.o.b. crematory. All deliveries are to be completed by Apr. 30 of next year. Address City Clk. Henry W. Odenthal, Joliet, Ill.

1065—Kansas City, Kan.—The Board of Education of Kansas City, Kan., will let its annual coal contract Aug. 5, at which time bids will be opened for 2000 tons of Cherokee lump. Address Pur. Agt. L. Friedman, Bd. of Edu., Kansas City, Kan.

+1066—Pella, Iowa—Bids will be received until July 20 for furnishing the City Electric Light Plant with steam, mine-run and lump coal, bids to include cost of delivery in the bin. Address Clk. A. C. Kuyper, Pella, Iowa.

+1067—Springfield, Ohio—Sealed bids will be received until 10 a.m., July 22, for furnishing and delivering coal as follows: 400 tons of Ohio, West Virginia or Kentucky splint mine-run to be delivered at the Court House, and the same amount and grade to be delivered f.o.b. sidetrack at the new infirmary at Donnellsville station. A certified check for $100 must accompany all bids. Address County Audr. J. M. Pierce, Springfield, Ohio.

1068—New York, N. Y.—The Department of Docks and Ferries will receive bids until noon on Wednesday, July 21, for furnishing and delivering 3000 gross tons of egg coal. Full particulars can be obtained at the headquarters of the Dock Department. Address Dock Comr. R. A. C. Smith, Pier "A," North River, New York.

+1069—Olivia, Minn.—The Board of Education for Independent School District No. 79 received sealed bids until 6 p.m., July 10, for furnishing the district with 100 tons of Youghiogheny lump coal during the ensuing year. Address Secy. George A. Peterson, Bd. of Edu., Olivia, Minn.

1070—Ashtabula, Ohio—The Board of Education will receive sealed bids until July 20 for furnishing approximately 100 tons of the best three-quarter Pittsburgh coal to be delivered to the local school building as required during the ensuing year. Address Clk. Charles E. Peck, Bd. of Edu., Ashtabula, Ohio.

+1071—Chippewa Falls, Wis.—The State Asylum at this place received sealed bids until 9 a.m., July 11, for furnishing 800 tons of screened West Virginia splint, Kentucky block and Hocking Valley lump coal to be delivered f.o.b. cars at the Asylum spur and Shawtown spur track. Deliveries are to be made as required between Aug. 1 of the current year and July 1, next year. Address Secy. Nan Macleod, State Asylum, Chippewa Falls, Wis.

+1072—Wadena, Minn.—The City Government received sealed bids until July 14 for furnishing approximately 1000 tons of Youghiogheny run-of-pile coal. Address Village Recorder A. C. Murray, Wadena, Minn.

+1073—Bridgeport, Conn.—Sealed bids were received until noon, June 9, for furnishing approximately 500 tons of bituminous coal to be used at the Public Library, the city yard and by the Fire Department. The business last year was done at $3.80 a ton. Address City Clerk, Bridgeport, Conn.

+1074—Buffalo, N. Y.—The lighthouse inspector at this place will receive sealed bids for furnishing the fuel required by the lighthouse tender "Crocus" during the fiscal year ending June 30. Blank proposal forms and particulars may be had on application. Address Lighthouse Inspector, Buffalo, N. Y.

+1075—Louisville, Ky. — The Louisville Industrial School of Reform, owned by the city and administered by a board, is calling for bids for a year's supply of coal. Pittsburgh and Kentucky lump and mine-run will be required, and bids will be received up to July 20. Last year the deliveries amounted to about 1000 tons. Address Secy. C. F. Leathers, Louisville Industrial School of Reform, Louisville, Ky.

+1076—New Cumberland, W. Va.—The Board of Education will receive sealed bids until noon, July 17, for furnishing coal to be delivered at the local school buildings. Address Secy. C. S. Bradley, Bd. of Edu., New Cumberland, W. Va.

+1077—Carlisle, Ky.—The County Board of Education will receive bids until 1 p.m., July 21, for furnishing the 10 schools in that district with red ash block Jellico coal or an equally good brand. Deliveries are to be completed during July and August. Address Lida E. Gardner, County Bd. of Edu., Carlisle, Ky.

+1078—Ionia, Mich.—The Board of Trustees for the Ionia State Hospital received sealed bids until July 13 for furnishing approximately 2500 tons of bituminous nut and slack coal. Bidders were required to submit an analysis of the coal and quotations were made f.o.b. cars on sidetrack at the hospital. Address Medical Supt. Dr. R. H. Haskell, Ionia State Hospital, Ionia, Mich.

+1079—Charleston, Ill.—The Charleston Union School District received bids until 5 p.m., July 13, for furnishing the various school buildings with coal. Deliveries are to be completed by Aug. 20 and about 400 tons will be required. Address Chn. F. M. Mealey, Fuel Com., Charleston Union School District, Charleston, Ill.

1080—Kansas City, Mo.—Morris & Co., packer, will let its yearly coal contract about the first of August. It uses about 750 tons of Cherokee slack per week during the summer months and 1200 tons per week during the winter months.

+1081—Frankfort, Ohio—The Board of Education of Concord Township will receive bids until 1 p.m., July 17, for furnishing 2200 bu. of lump coal. About 1500 bu. are to be delivered on track at Roxabel and the balance on track at Austin. Deliveries are to be completed by Aug. 5. The coal is to be screened over a 4-in. bar and must be forked from the car and weighed on wagon. Address Clerk, Board of Education, Concord Township, Frankfort, Ohio.

+1082—Sioux Falls, S. D.—Sealed bids were received until 9 a.m., July 12, for furnishing the City Water-Works Pumping Station with approximately 1000 tons of Wilmington screened lump coal, Youghiogheny No. 2 pool gas coal, dock-run or screened lump, Elkhorn, Ky., dock-run, or screenings. Bids are to include cost of delivery to the pumping station as required until Apr. 1, 1916. Address City Audr. Walter C. Leyse, Sioux Falls, S. D.

+1083—Richmond, Ind.—The Wayne County Commissioners will receive bids until July 17 for furnishing the various county institutions with coal during the ensuing year. Address Audr. L. S. Bowman, County Comrs., Richmond, Ind.

+1084—New Lexington, Ohio—Sealed bids will be received by the Board of Education at this place until 7 p.m., July 31, for furnishing the local schools with coal. Address Clk. C. O. Ferguson, Bd. of Edu., Pleasant Township, New Lexington, Ohio.

+1085—Wilkinsburg, Penn.—The Borough Government at this place received bids until noon, July 12, for furnishing the local schools with lump and slack coal. Address Dr. F. R. Stotler, Chn. Com. on Supplies, 611 Penn Ave., Wilkinsburg, Penn.

+1086—Clinton, Mo.—Sealed bids will be received until 2 p.m., Aug. 4, for furnishing the local Court House, County Jail and County Home with coal. Address Deputy Thornton Jennings, Clinton, Mo.

+1087—Wells, Minn.—The School Board at this place received sealed bids until July 10 for furnishing its coal requirements. Quotations were to be f.o.b. sidetrack at this place. Address Secy. E. O. Oren, Bd. of Edu., Wells, Minn.

+1088—New York, N. Y.—Bids will be received until 2 p.m., July 22, by the Department of Bridges of New York City for furnishing and delivering 250 gross tons of No. 1 buckwheat and 250 gross tons of mine-run for use on the Brooklyn Bridge. Further particulars can be obtained on application. Address Bridge Comr. F. J. H. Kracke, Municipal Bldg., New York City.

+1089—St. Louis, Mo.—Bids for supplying the local Water-Works with fuel requirements during the ensuing year will be requested some time in August. Lump and washed coal are used, and the plant consumes about $100,000 worth of coal a year. The department is considering the advisability of using screenings in the future. Address Board of Water Commissioners, St. Louis, Mo.

+1090—Columbus, Ohio—The Public Service Department will receive sealed bids until noon, July 27, for furnishing coal approximately as follows: Municipal Light Plant, 10,000 tons; Scioto River Pumping Station, 3500 tons; Garbage Reduction Works, 2500 tons; City Hall Building, 140 tons; Schiller Park, 50 tons; Water-Works Shop, 75 tons; State St. Yard, 25 tons; Goodale Park, 20 tons; Recreation Department, 70 tons. Blank forms and specifications can be had on application. All bids must be accompanied by certified check for not less than 10% of the total amount of the bid, and the successful bidder will be required to furnish a bond of 50% of the amount of the bid. Address Clk. Paul B. Kemper, Public Service Comn., Columbus, Ohio.

+1091—Beamsville, Ont.—The local School Board will receive bids until July 20 for furnishing the schools with anthracite stove coal. Deliveries are to be made in August. Address Secy. J. A. Sinclair, Bd. of Edu., Beamsville, Ont.

+1092—Muskegon, Mich.—Sealed bids will be received until 8 p.m., July 19, for furnishing the Fire Department, City Hall, Water Department and Poor Department with coal during the ensuing year. Address City Recorder B. H. Tellman, Muskegon, Mich.

+1093—Franklin, Penn.—Sealed proposals will be received until 5 p.m., Aug. 2, for furnishing the local City Government with approximately 2400 tons of three-quarter lump coal. Quotations should be made in carload lots, f.o.b. New York Central switch at pump station. Deliveries are to be as required and will be completed before Jan. 1. Address City Clk. J. G. Crawford, Franklin, Penn.

+1094—Fairfield, Iowa—Bids will be received until noon, July 19, for furnishing the local School District with 1200 bu. of coal during the ensuing year. Address Secy. J. W. Dole, Independent School District, Fairfield, Iowa.

+1095—Lynn, Mass.—The City Government will receive bids until 10 a.m., July 16, for furnishing coal as follows:

Franklin County stove, 50 tons; Logan, 100 tons; New River, 100 tons; white ash broken, 300 tons; white ash stove, 500 tons; white ash egg, 1000 tons; Cumberland, Pocahontas or George's Creek, 2000 tons. Deliveries are to be made as required during the fiscal year beginning Aug. 1. Address City Pur. Agt. Albert S. Carleton, City Hall, Lynn, Mass.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

✚**No. 362—Portland, Ore.**—This contract (Vol. 7, pp. 566, 707), which provides for furnishing the local schools with coal during the ensuing year has been awarded as follows: **Edlefsen Fuel Co.**, steam coal at $5.49; **Pacific Coast Coal Co.**, briquettes at $7, **Liberty Coal & Iron Co.**, steam coal at $5.50. About 640 tons was awarded to each firm. Address Clk. R. H. Thomas, Bd. of Edu., Portland, Ore.

No. 461—Boston, Mass.—The award to the **Gorman-Leonard Coal Co.** for supplying the Infirmary Department and City Hospital on this contract (Vol. 7, pp. 627, 748, 794, 956) has been approved by the Acting Mayor. Address Supt. of Supplies D. Frank Doherty, Room 808, City Hall Annex, Boston, Mass.

No. 784—Louisville, Ky.—This contract (Vol. 7, p. 1005), which provides for furnishing William Schuff & Co. with about two carloads of nut and slack coal per month has been awarded to the **Western Kentucky Fuel Co.** Address Supt. F. W. Wagner, William Schuff & Co., 803 S. 12th St., Louisville, Ky.

✚**No. 806—Galveston, Tex.**—This contract (p. 1006), which provides for furnishing the Depot Quartermaster at the Port of Embarkation with coal during the ensuing year, has been awarded to the **Clinchfield Fuel Co.**, on the following basis per short ton: Delivered and trimmed in transport bunkers from contractor's barge, $6.50 at Galveston, and $6.20 at Texas City; same not trimmed 40c. per ton less; same as the first except delivered from contractor's dock, $6.15 at Galveston, and $5.95 at Texas City; same delivered on transport dock, or in coal ports, $5.75 per ton at Galveston, and $5.55 at Texas City; delivered in contractor's barges alongside of transports, $5.90 at Galveston, and $5.60 at Texas City; delivered on Government barges at contractor's dock, and distributed by a Government tug $5.55 at Galveston, and $5.35 at Texas City; delivered from chutes into transports at contractors dock (not trimmed), $5.65 at Galveston and $5.45 at Texas City; same delivered into contractors barges and distributed by Government tugs, $5.70 at Galveston, and $5.50 at Texas City. The contract will be filled on Clinchfield Navigation Coal from the Clinchfield Mine, Dante, Russel Co., Va.; this coal runs 14,000 B.t.u. Address Lt.-Col. Quartermaster Corps, C. R. Krauthoff, Depot Quartermaster, Galveston, Tex.

✚**No. 819—Austin, Tex.**—This contract (Vol. 7, pp. 1048, 1026), which provides for furnishing the State Charitable Institutions with coal, has been awarded to the following companies. **Wagner Wells Mfg. Co.; Richardson; Walter Tipps; Aherns Ott Mfg. Co.**. The gross consideration aggregates about $40,000. Address State Purch. Agt. George Leavy, Austin, Tex.

✚**No. 820—Indianapolis, Ind.**—This contract (Vol. 7, p. 1049), which provides for furnishing the State House with coal during the ensuing year has been awarded to the **Indianapolis Motor & Fuel Co.** at $3.21 per ton for No. 3 vein Pocahontas coal. The tonnage is small, to amount to about 1200 tons. Address State Engineer, State House, Indianapolis, Ind.

✚**No. 828—Grand Forks, N. D.**—This contract (p. 1049), which provides for furnishing the University of North Dakota with approximately 3000 tons of coal, has been awarded to the **Stinson Implement & Fuel Co.**, in Youghiogheny screenings at $2.42 per ton on a heat unit basis, f.o.b. dock. A B.t.u. value (on a wet basis) of 14,150 is guaranteed, and fixed carbon of 58%. Address Secy. J. W. Wilkerson, University of North Dakota, Grand Forks, N. D.

✚**No. 839—Hoboken, N. J.**—This contract (Vol. 7, pp. 1049, 1085), which provides for furnishing the local Board of Education with about 2000 tons of coal, has been awarded to the **Consumers' Coal Co.** Address Business Mgr. R. A. Marnell, Bd. of Edu., Hoboken, N. J.

✚**No. 843—Columbus, Ohio**—This contract (Vol. 7, p. 1049, Vol. 8, p. 40), which provides for furnishing the fuel requirements of Franklin County has been awarded as follows: **Peacock Coal Co.**, 4000 tons Pomeroy mine run, delivered at Infirmary switch $1.60; **M. A. Suydam & Co.**, 12,000 tons same, delivered to the Court House and 215 tons delivered to the Memorial Bldg. and the County Morgue at $1.95. Address Clk. John Scott, Bd. of County Comrs., Columbus, Ohio.

✚**No. 844—Lexington, Ky.**—This contract (Vol. 7, p 1049), which provides for furnishing the local Board of Education with about 1000 tons of coal, has been let to the **Kinhead Coal Co.** on Cumberland lump coal at $2.85. This contract last year was let at $2.90. The coal is screened over a 2-in. shaker screen. Deliveries are to be made as required. Address Clk. J. H. Sinwall, Bd. of Edu., Lexington, Ky.

✚**No. 852—Canal Dover, Ohio**—This contract (Vol. 7, p. 1085), which provides for furnishing the Public Service Department with approximately 1500 tons of mine-run coal, was awarded to **Erwin Bros.** at $1.35 per ton. Other bids on this contract were George Gintz, $1.64; John Hartz, $1.59; Alonzo Gibbs, $1.45. Address, Dir. Osmond Salmond, Public Service Commission, Canal Dover, Ohio.

✚**No. 879—Peabody, Mass.**—This contract (Vol. 7, p. 1086), which provides for furnishing the local Electric Light Department with about 5000 tons of coal, has been let to **George W. Pickering**, of Salem, at $4.59 per ton for Pocahontas coal. Other bids on this contract were $4.67 and $4.70. Address Mgr. Warren D. King, Peabody Electric Light Dept., Peabody, Mass.

✚**No. 884—Ottawa, Can.**—This contract (Vol. 7, p. 1086), which provides for furnishing the County Jail and Court House with about 250 tons of anthracite egg has been awarded to the **C. C. Kay Co.** at $7 per ton. Other bids on this contract range from $7.25 per ton upward. Address County Clk. Charles MacNab, Ottawa, Can.

✚**No. 887—Binghamton, N. Y.**—This contract (Vol. 7, p. 1086), which provides for furnishing the City Government with coal, has been awarded to **Ford, Powell & Hammond** and **O. W. Sears & Son.** Bids of the various companies, including those to whom the contracts were awarded, were as follows:

	Egg	Chestnut	Stove	Pea	Bituminous	Buckwheat
Ford, Powell & Hammond	**$5.35**	**$5.57**	**$5.35**	$4.35	$3.45	$3.15
O. W. Sears & Son	5.55	5.80	5.55	**4.00**	**2.98**	**3.15**
Binghamton Coal Co.	5.70	5.90	5.70	4.70	3.20	
Charles McKinney	5.70	6.00	5.70	4.60		3.30
Economy Coal Co.	5.60	5.85	5.70	4.85	3.35	3.10
S. M. Elliott	5.40	6.00	5.40	4.20	3.30	3.15

Address Dept. of Public Works, Binghamton, N. Y.

✚**No. 919—Pontiac, Mich.**—This contract (Vol. 7, p. 1127), which provides for furnishing the local Board of Education with coal during the ensuing year, has been awarded as follows: **Gates Bros.**, West Virginia ¾ lump, $3.20; **J. L. Sibley Co.**, anthracite, egg and stove coal, $7 per ton. Address Secy. Elmer L. Webster, Bd. of Edu., Pontiac, Mich.

✚**No. 920—Lincoln, Neb.**—This contract (Vol. 7, p. 1127), which provides for furnishing the state institutions with coal during the ensuing year, has been awarded as follows:

	Price	Tonnage
BEATRICE (Institution for Feeble-minded Youth)		
Coal Hill Coal Co., Omaha, deep shaft, mill	$3.75	2000 or
Coal Hill Coal Co., Omaha, deep shaft, slack	3.55	2000
Coal Hill Coal Co., Omaha Range, Routt Co., Colo. nut	6.15	100
H. B. Miles, Lincoln Southern Kan. washed slack	4.40	1000
H. B. Miles, Lincoln nut, 3x1-in., Southern Kan.	4.10	1000
GENEVA (Girls' Industrial School)		
H. B. Miles, Lincoln Steam, Economy, Mo. or Iowa nut	3.90	680
BURKETT (Soldiers' and Sailors' Home)		
Coal Hill Coal Co. Routt Co., Colo. lump	5.60	250
Coal Hill Coal Co. Routt Co., Colo. nut	5.35	250
Whitebreast Coal Co. pea and slack Lincoln, Neb., Weir City, S. Kansas	3.40	2500
INGLESIDE (Hospital for Insane)		
Whitebreast Coal Co. pea and slack, Weir City, S. Kan.	3.38	4500
Whitebreast Coal Co., Rock Springs, Wyo., screened nut	5.54	500
KEARNEY (State Industrial School)		
W. L. Stickel Lbr. Co. Kearney Hanna nut	5.13	90
W. L. Stickel Lbr. Co. Kearney Steam, Hanna slack	3.62	1200
KEARNEY (Hospital for Tuberculous)		
W. L. Stickel Lbr. Co. Steam, Hanna slack	3.62	400
W. L. Stickel Lbr. Co. Range, Hanna nut	5.13	20
LINCOLN (Hospital for Insane)		
H. B. Miles Maitland nut or Canon City, Colo. range	5.70	200
Geo. W. Voss, Lincoln Penn. anthracite, egg	10.40	10
Whitebreast Coal Co. pea and slack, S. Kans., Weir City	3.40	4500
LINCOLN (Orthopedic Hospital)		
George W. Voss, S. Kan., nut, screened	3.80	1200
LINCOLN (State Penitentiary)		
Whitebreast Coal Co., Weir City, S. Kan. pea and slack	2.85	5450
Whitebreast Coal Co., Rock Springs, Wyo. screened nut	5.45	100
MILFORD (Nebraska Industrial Home)		
Coal Hill Co., Routt Co., Colo. lump, range	5.85	100
H. B. Miles, S. Kan. screened nut, steam	3.84	800
MILFORD (Soldiers' and Sailors' Home)		
H. B. Miles, So. Kan. nut, screened, steam	3.84	500
Coal Hill Coal Co., Routt Co., Colo. nut, range	5.60	100
NEBRASKA CITY (Institute for the Blind)		
Union Coal Co. Lincoln, S. Kan. mine-run	4.19	600
Union Coal Co. Lincoln, Nokomis, Ill. nut	4.50	40
NORFOLK (Hospital for Insane)		
Geo. W. Voss Range, nut, Rock Spring, Wyo.	5.50	50
Whitebreast Coal Co., pea and slack, Weir City, S. Kan.	3.92	3000
OMAHA (School for the Deaf)		
Central Coal & Coke Co., Range, Ill., 3x6 egg	4.89	40
Sunderland Bros. Co., steam, S. Kan., Weir City, slack	3.25	1200

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COAL AGE

Vol. 8 NEW YORK, JULY 24, 1915 No. 4

APPRECIATION

By MICHAEL BERNARD

With An Autocratic Air—

You, the men of strong opinions,
Who, from desk and swivel chair,
Issue orders to your minions
With an autocratic air,
Have you never paused a second
As you ruled your mining crew,
And with business judgment reckoned
What a word of praise would do?

You're the chaps that raise a ruction—

When, by some mischance, production
Takes a downward-trending course,
You're the chaps that raise a ruction
And condemn the working force;
But in case their zeal unending
Makes a record-breaking run,
What prevents you from commending
All the work that they have done?

Tell them plainly of the matter—

Do you fear misunderstanding
Of your meager words of praise,
And the men will come demanding
That you give them all a raise?
Don't attempt to puff or flatter,
Shun the bunk and blarney then;
Tell them plainly of the matter
As a man who speaks to men.

Still, they like to hear you saying—

Yes, it's very true you're paying
For their heavy toil's return;
Still, they like to hear you saying
That they're worth the wage they earn;
And when words of commendation
Crown their labor's weary close,
Then the cup of their elation
Brimming fills and overflows.

YOU CAN BUY *a man's exertions, yet you make him a machine*
When you base your whole relation on the crisp and crinkly green;
But the minute that you show him that you've red blood in your veins,
You have changed a bondsman's fetters into friendship's loyal chains.

Alternating-Current Machines for Small Coal Mines

By E. C. De Wolfe*

SYNOPSIS—A specific instance of where an old abandoned mine in thin coal was rehabilitated and its operation rendered a commercial proposition by the purchase of power, which is both bought and consumed as alternating current.

Cutting machines driven by alternating current find a field of special adaptability in placing the advantages of machine mining within the reach of small mines for which the expense of a complete power plant seems unwarranted. As one example of such application can be cited the American Cannel Coal Co., at Cannelton, Perry County, Ind., on the Ohio River.

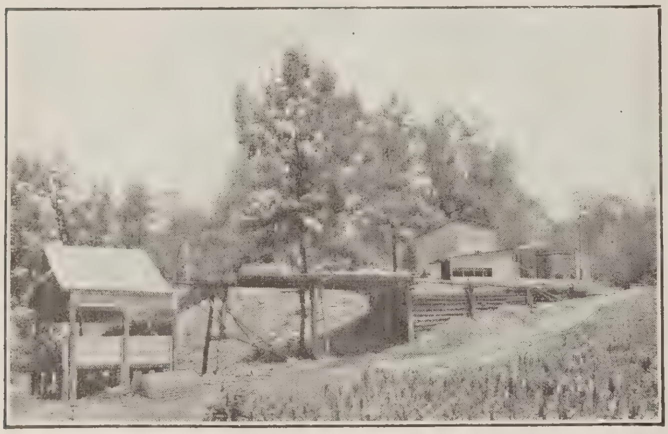

FIG. 1. THE TIPPLE AT THE "GOPHER HOLE"

Here, by installation of a modern item of mine equipment, there has been rehabilitated one of the oldest mines in the oldest mining district of Indiana. The Geological Survey is authority for the statement that Perry County coal was taken by Robert Fulton aboard the steamer "Orleans" on its first trip down the Ohio River in 1811. First attempts at commercial mining were made in 1837, when the American Cannel Coal Co. was incorporated by act of the Indiana General Assembly "to mine stone coal at Coal Haven," which afterward became Cannelton. A total area of 6456 acres was acquired by various purchases, and in sale of surface for other uses the mineral rights were always retained.

Severl mines were opened and coal was hauled in rude cars, on strap rails, over a wood trestle tramway to the river, where a tip deposited the coal upon a floating platform. "Here," says James De la Hunt, Perry County's historian, "a large painted sign called the attention of passing steamboats to the new fuel, lauding its merits as a steam producer and urging its cheapness." The boats all burned wood, and the adoption of coal was slow, yet steady, and the company built up a good trade. During the Civil War river gunboats were fueled with coal from these mines.

Some of the early openings were abandoned as distances and thinning of the seam made working impractical, or unremunerative with the changes in market conditions in later years. It is at one of these abandoned openings, wherein the coal had thinned to impracticable height for hand mining, that a Goodman alternating-current shortwall machine has been placed in service, giving the mine a new "lease of life" and enabling the company to push ahead into otherwise lost territory, where the coal runs as low as 24 in. in thickness.

To install a complete power plant at this little "gopher hole," as Secretary Shallcross modestly terms the present mine (Fig. 1), would be obviously prohibitive in cost and operating expense. To purchase the only available commercial power—alternating current—and convert it to continuous current for driving a machine of that type would involve installation of converter equipment. This would result in a higher cost and lower efficiency than for static transformers to step down the high-tension transmission line voltage for mine use.

Hence the alternating-current shortwall machine, run by purchased power, received over an economical transmission line and reduced to operating voltage by simple means, involves no attendance charges. Power costs are thus made low and always directly proportional to machine productivity.

Cutting Is Done Below the Coal

Underlying the coal is a hard fireclay in which the cutting is done, the difficulties of its hardness being offset by the advantages of gaining the necessary height for working and of saving the entire coal seam for loading out in good-sized pieces. The fireclay is so hard that, except in local soft spots, it is known by the men simply as "rock."

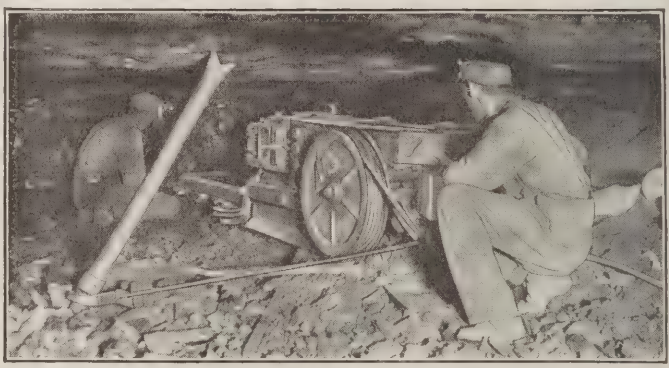

FIG. 2. ALTERNATING-CURRENT MACHINE AT WORK

Cutting beneath the coal the machine makes a bottom 6 in. below the seam, giving 30 in. of working height where the coal is 24 in. thick. On its special low drop-axle truck the machine enters easily the low rooms, though in some places the ties have to be embedded into the bottom. Roofs on the entries are brushed to give traveling height for the mules.

The drop-front feature of the Goodman truck enables unloading even when the machine may be rubbing the roof. Unloading, running cuts and reloading are all equally easy. Of particular importance, however, is the tilting shoe with which the machine is fitted and by means of which the runner is able readily to control the cutting, to keep the machine just so far beneath the coal and make it leave a good bottom.

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*608 Dearborn St., Chicago, Ill.

Rooms are worked 30 ft. wide and 225 ft. deep, with 9-ft. pillars through which five 12-ft. breakthroughs are cut, giving about 85 per cent. recovery from the working as a whole. Coal is loaded into 1-ton cars and hauled out by mules over 42-in. gage track laid with 16-lb. rails. Room curves have 15-ft. center radius, on which the operation of the machine is facilitated by the independent cable-reel trailer truck.

Three-phase current is transmitted to the mine at 2200 volts and stepped down to 220 volts for the mine circuits and machine use. The mine leads are heavily insulated and substantially hung along the rib on the entries. The machine is mechanically of standard shortwall construction, with only the electrical parts arranged for use of alternating current.

The American Cannel Coal Co. is only one of many small and moderate producers that have installed alternating-current mining machines of various types to good advantage under their own peculiar conditions.

German Coal Industry in 1914

In 1889, 25 years ago, the German coal production amounted to 67 million tons. The largest production was reached in 1913 with 191½ million tons, dropping in 1914 to about 161½ million tons, being a decrease of 30 million tons. The reduction affected the states as shown in Table 1.

The production of brown coal in 1914 amounted to 83.9 million tons, being a decrease of 3.2 million tons, or 3.64 per cent., as against 1913, which production still exceeds the output in 1912 by approximately 3 million tons. The production of brown coal in the various states was as shown in Table 2. The decrease in production in 1914, amounting to 33.1 million tons, or 11.9 per cent., compares with the English loss in production of 40 million tons or 15.16 per cent.

In the district of Upper Silesia a brisk demand for all grades is reported. The approach of warmer weather has not, as usual, caused a decrease in the demand, as dealers who as a rule reduced their spring orders by 50 to 60 per cent. endeavor to close summer contracts in undiminished quantities. The coal combine, however, is not inclined to comply with these demands, one reason being to prevent speculation and the other to consider in the first place manufacturing industries and gas works of central and northeast Germany, which now depend exclusively upon the Upper Silesian production. Regular customers, however, are served as before.

TABLE 1. COMPARATIVE GERMAN COAL PRODUCTION IN 1914 AND 1913 IN 1000 METRIC TONS

State	1914	1913	Loss (%)
Prussia	153,006	181,413	— 15.66
Saxony	4,836	5,471	— 11.61
Bavaria	660	811	— 18.62
Alsace-Lorraine	2,857	3,796	— 24.74
Other districts	176	20	+ 880
Total	161,535	191,511	— 15.65

TABLE 2. COMPARATIVE GERMAN PRODUCTION OF BROWN COAL IN 1914 AND 1913 IN 1000 METRIC TONS

State	1914	1913	Loss (%)
Prussia	67,424	70,256	— 4.03
Saxony	6,298	6,312	— 0.28
Bavaria	1,601	1,895	— 15.52
Hesse	402	429	— 6.30
Brunswick	2,235	1,824	+ 22.53
Saxony-Altenburg	4,797	4,910	— 2.30
Anhalt	1,180	1,474	— 19.95
Reuss	10	12	— 16.67
Total	83,947	87,116	— 3.64

Deliveries on contracts are made promptly, and in spite of lack of labor the output approaches 68 per cent. of the normal production, thus complying with the domestic demand, besides furnishing 100,000 tons monthly to Austraia.

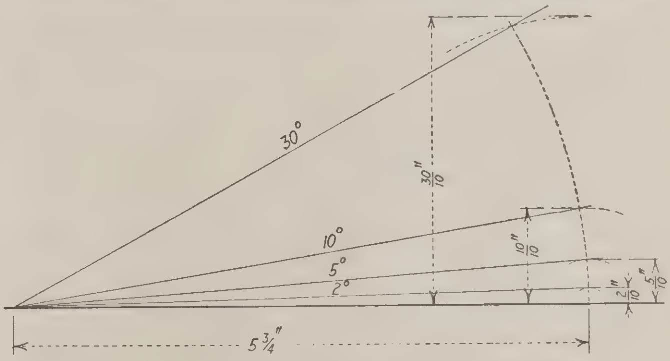
The export from the Upper Silesian coal district amounts now to 6 per cent. normal production, as compared with 38 per cent. in normal times. Provision has been made for a considerable reserve in coal in order to safeguard the necessary requirement for the industries, in case the political situation should cause a further reduction in the output.

Inquiries for delivery are reported from Holland, but which under the circumstances cannot be considered, as all surplus quantities are being reserved for the Austrian market.

Laying Out Small Angles

Francis W. Shaw in the *American Machinist* describes a simple but accurate method of laying out small angles in the absence of a good protractor or drafting machine. As much accuracy is obtainable in this method of plotting angles as is secured when an ordinary protractor is used. Theoretically the error in laying out an angle of 1 deg. by this method is but 4 sec. With an angle of 10 deg. it is less than 1 min., and even a 30-deg. angle can be determined in this way with an error of only 13 min.

From the base line draw an arc of 5⅜-in. radius and lay out the desired angle along this arc, setting the compasses or dividers to $\frac{1}{10}$ in. for every degree. Join the center of the large arc with the points determined on its perimeter.



MANNER OF LAYING OFF ANGLES WITHOUT A PROTRACTOR

For angles approaching 30 deg., lay out an angle of 30 deg. with the triangle and add or deduct the small angle of difference. For angles near 15 deg., bisect an angle of 30 deg., adding or deducting the difference in angle.

* * *

Chinese Mining Superstitions—Although the Liao Yune district in Mongolia is hilly, there are no mountains where mining operations may be carried on. This is due to the fact that the mountains which may possibly contain minerals are considered sacred by the Mongols, and therefore out of reach of mineralogists. Should any construction materials, such as sand or stone, be required for repairing roads, etc., they must be obtained from districts well removed from these mountains.

Pea Coal--An Outlaw Size

For several months past the wholesale prices in the anthracite market have been badly unsettled. There has been a wide divergence between the prices as shown on the circulars issued and the actual selling prices, particularly as regards pea coal. The low market value of this grade has been due to nothing more than a natural adjustment to an inevitable condition. As is well known, pea and all the smaller sizes are byproducts pure and simple; in other words, these sizes are not made by design, but happen in the production of the so-called prepared or domestic grades. The production of pea ranges from 10 to 40 per cent. of the entire output, the variation depending on the hardness of the seam from which the coal comes and the percentage of larger sizes for which the breaker rolls are adjusted. A fair average would be 22 per cent.

In the beginning of the anthracite industry pea and the smaller sizes were regarded as waste products. Finally a market was developed for them as steam fuel, but in addition pea began to find quite a place for itself in the domestic market, because of its low price as compared to the next nearest domestic coal; the operators, however, tried to discourage its use as a family coal, insisting that it was only a steam fuel.

With the natural advance in price of all commodities during the past 10 years, pea coal experienced a raise proportionate to the other sizes, which made its price as a steam coal, in competition with bituminous, practically prohibitive. As a result there is now less than 1 per cent. of pea coal being used for steam purposes, and while the smaller sizes still maintain their position as steam coals, almost the entire tonnage of pea is left to be absorbed as best it can. The only market left for this grade is naturally the domestic or family trade, and it has now become eminently a family size and must be so considered. It will probably continue a family coal exclusively unless the operators are willing to make an attractive offer to steam consumers. This would certainly tend to stabilize the market on all sizes and would help to prevent the unsettling conditions due to price cutting on this grade.

⁂

How to Repair Steel Tapes

Many engineers and surveyors repair their own steel tapes, the repair outfit consisting of a combined punch and rivet set and copper rivets or eyelets. Few know how to repair a broken tape properly, even when furnished with all the necessary facilities, says *Engineering News*.

The point which needs the most emphasis is that no matter how it is broken some of the original tape must be cut away and a new piece spliced in. This applies both to graduated ribbon tapes and to most of those made of heavy flat wire. Any mend which stiffens the tape at the splice weakens it and makes it more likely to break near there a second time, especially in the case of thin ribbon tapes. The only exception is in repairing heavy wire tapes, 1/8 in. wide or less, which are usually so stiff that they can be mended with a soldered sleeve.

In Fig. 1, tapes Nos. 1, 2 and 3 illustrate defective splices. No. 1 is made by lapping the tape by 0.12 ft. and securing the lap with six eyelets. A little consideration would have shown that two eyelets and a 0.02-ft. lap would have done just as well.

No. 2 is another lap joint a little over 0.1 ft. long. In No. 3 the whole of the old tape has been retained and the repair made by riveting a piece 0.15 ft. long on the back. Solid rivets have been used, though eyelets would have been preferable. Nos. 2 and 3 also illustrate defective methods of fastening on the end rings—the laps for that purpose are too long. However, the handle in No. 2 illustration would be correctly fastened if the laps were shorter, for two eyelets have been used to secure the lap, and that is the correct number.

Nos. 4 and 5 show conscientious and ingenious attempts to assure flexibility, but by means not to be recommended.

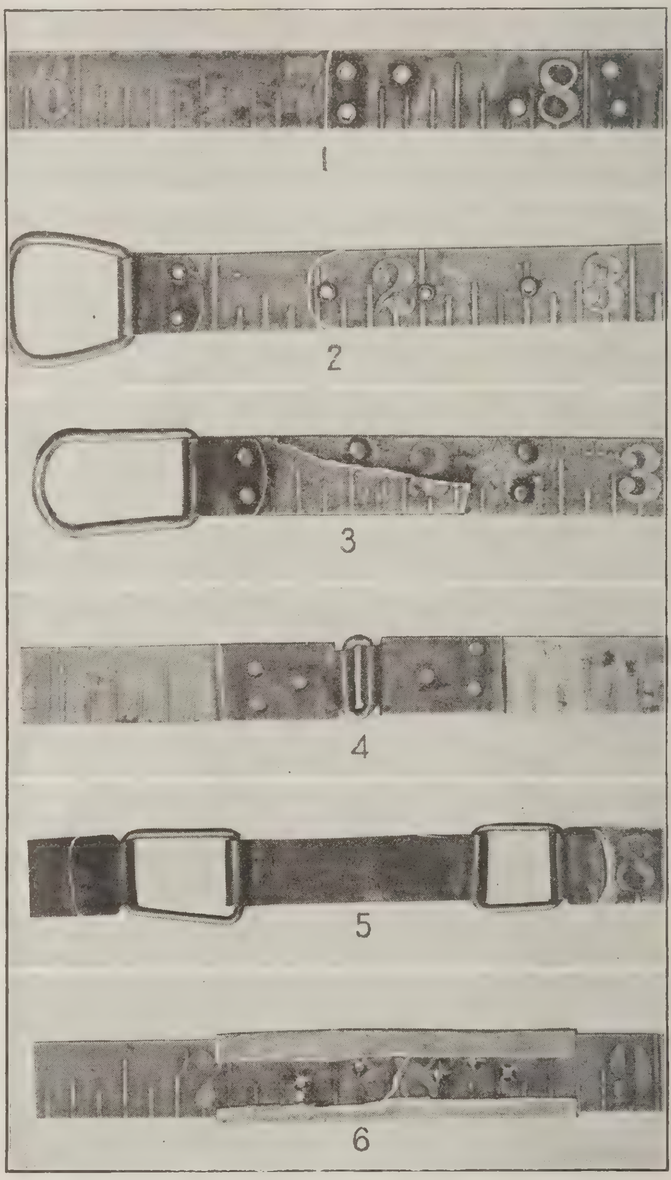


FIG. 1. "HORRIBLE EXAMPLES" OF TAPE REPAIRS

No. 6 is a crude but effective repair, no doubt made in camp. The sleeve was probably cut from a tin can, and it is likely that a nail was used for a punch, the motive power being furnished by blows of an ax. There are no rivets, and the sleeve holds by depressions punched partly through the tape.

In Fig. 2 is illustrated the proper way to make tape repairs. First punch two holes in each of the broken ends 1 in. or more back from the break. Take a piece of tape about 2 in. longer than the completed splice is to be, lay one of the broken ends on the splice, tying it tightly to insure proper alignment, and punch holes in the splice through the holes already punched in the tape, placing and setting a rivet as soon as a hole is punched. Solid rivets are used for flat-wire or band tapes, and when the tape is $\frac{1}{4}$ in. or less wide, the rivets are placed in tandem, as shown in No. 1, Fig. 2. After the splice has been riveted to one end of the broken tape, lay the other broken end on it and butting the two ends of the break together, tie it in place and rivet as before. When all rivets are driven, notch the ends of the tape close to the rivets with an edged file and break the tape on the file marks. In the same manner notch and break off the ends of the splice close to the rivets. The result is a lap of not over 0.03 ft. for a tandem splice and a little over 0.01 ft. (or $\frac{1}{8}$ in.) for rivets side by side, which means a tape practically as flexible as if it were new. For thin ribbon tapes eyelets should always be used instead of solid rivets, as shown in Nos. 3 and 4, Fig. 2.

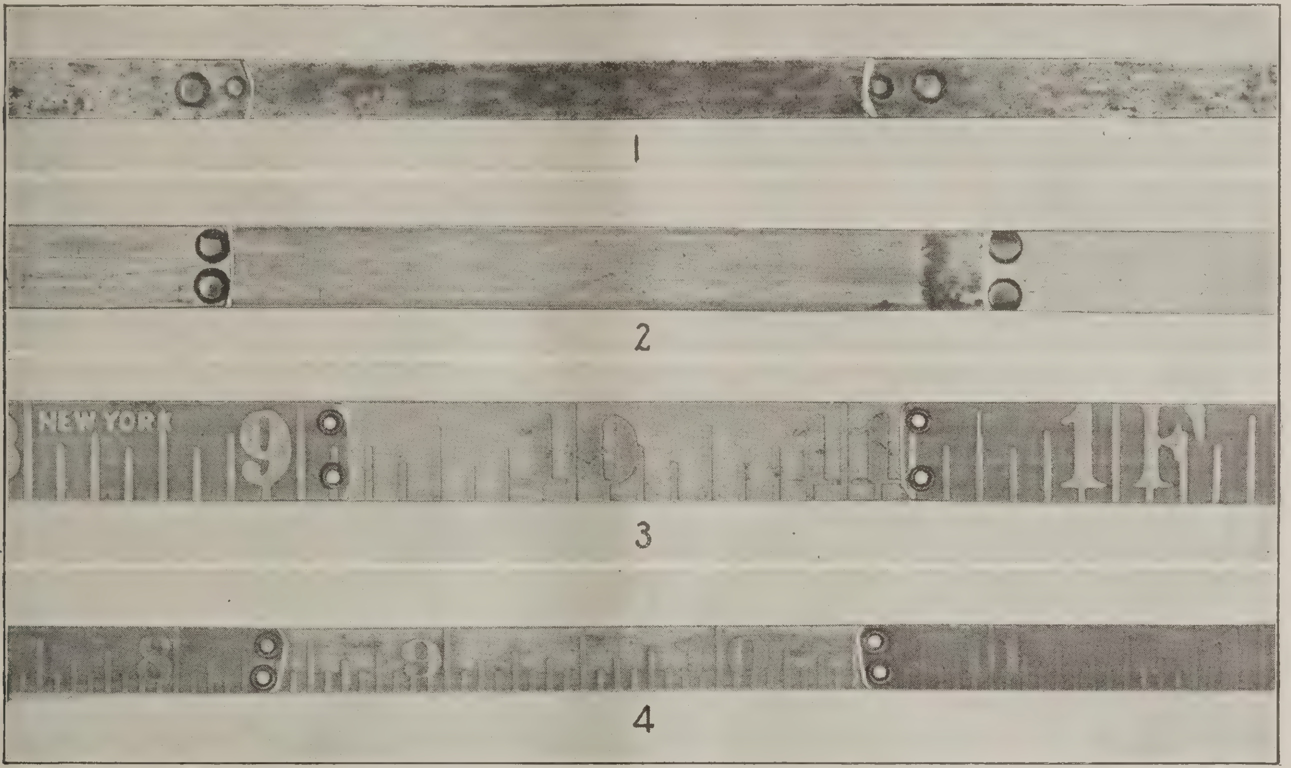


FIG. 2. EXAMPLES OF TAPES REPAIRED SO AS TO PRESERVE THE MAXIMUM FLEXIBILITY

To replace a broken ring or repair a tape broken at the ring, take a piece of similar tape showing any foot mark. Lay the ring with its clip or sleeve in place on this splice-tape, and hold it there by slipping a narrow piece of tape (or wire) under the splice-tape and over the ring (see Fig. 3). Punch one hole through the ring clip and tape, separate, and cut the tape close to the hole; insert the clip, and rivet, using a long eyelet. Then punch the second hole and rivet as before. Notch the clip with a file close to the eyelets and break it off on both sides of the tape. Rivet the new section to the broken end, not less than $2\frac{1}{2}$ in., or 0.2 ft., from the end, being careful to lay the new piece on top of the old tape.

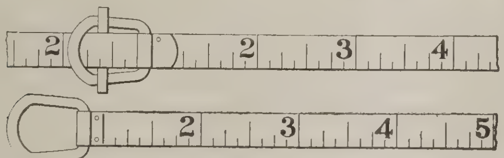


FIG. 3. HOW TO PUT THE RING END ON A TAPE

Indiana Mines Yield More Than 16,000,000 Tons of Coal

In 1914 the mines of Indiana yielded 16,641,132 tons of coal, having a value of $18,290,928, according to a statement by C. E. Lesher, of the Geological Survey. This shows a decrease from the 1913 figures of 524,539 tons, or 3 per cent. in quantity, and $710,953, or 3.7 per cent. in value.

Out of 19 coal-producing counties in Indiana 6 showed an increase in 1914, all the increases being small except that in Vigo County, which in 1914 had an output greater than in 1913 by more than 530,000 tons. On the other hand, the neighboring counties of Greene, Clay, Knox and Parke each showed a decrease of over 100,000 tons. The average price per ton for the state was $1.10.

There was no decrease in the proportion of the product shot off the solid, the figures being 5,175,229 tons in 1913 against 4,968,065 tons in 1914, approximately 30 per cent. in both years. The quantity of hand-mined coal decreased from 11 per cent. to 10.6 per cent. in 1914, and the number of mining machines in use increased from 732 in 1913 to 751 in 1914.

The Bureau of Mines reported 44 fatal accidents in the mines of Indiana during 1914, a decrease of 22 from those reported in 1913. This brought the death rate per thousand from 2.97 in 1913 to 1.97 for 1914.

⁂

Higher Coal Prices in England

The West Yorkshire Coal Owners' Association on June 1 advanced household fuel 81 cents per ton and industrial fuel $1.46 per ton, says *Commerce Reports*. The prices are now $2.67 for pea-slack, $3.40 for rough slack and $3.89 for nut at the pit. The *Yorkshire Post* states that the enhanced prices make the industrial situation a difficult one and that still another advance is hinted at.

Why Are Strikes at Coal Mines of Such Frequent Occurrence?--II*

By Hugh Archibald†

SYNOPSIS—The policy of coal operators has too often been to build poor houses and make undue profits from them. This has led the miner to believe that he is the victim of every kind of injustice. The miner needs the union. If the union is not what it should be, the faults are not inherent in the organization, but are merely incidental.

One of the causes for the frequency of strikes is the company house, on which the miner feels undue profits are made. It hardly needs argument to prove that there is a desire in every man to live decently. The "hunkies" and foreigners who come to this country do not have as high a plane of living as those who have been here a long time. But the foreigner soon acquires the desire to live on a higher plane and will readily admit this as a fact.

I have heard one Polander who had been here only 15 years explaining that the reason why a certain compatriot's scale of living was low was because the man had been in America only a couple of years. This fact is recognized by the management of many companies, and good work is being done in improving mining towns. It is a movement that comes second to the safety-first propaganda, but it is not as general or as thorough as it might be. In many places much talking is done, but little actual work is accomplished, only enough to make a superficial compliance with a fashionable fad.

It should be a distinctly recognized factor that mining differs from manufacturing in that the whole life of the community is dependent upon the management of the mine. In manufacturing there is not that absolute dependence.

In the first place, mining is the winning of raw material and must be carried on at the point where the material is found. On the other hand, a factory can be located at any central point where raw material can be brought to it conveniently and where the finished product can be readily shipped away. The location of such a plant does not need to be moved as the sources of its supplies change, and there is no limit to the length of its life, for the products it uses and produces vary with necessity.

Operators Must Build Houses

The life of a mine is limited, and when it is ended no other mine in the same neighborhood will take its place. As a result a mine is a temporary installation; nothing is built in coördination with its activity, and the mine worker is largely isolated from workers in all other lines. Frequently a mine is situated at the end of a branch railroad away from the main currents of travel and thought. This would tend to cause the community to retrograde, but the tendency is offset by the short length of life of the mining town and the frequent coming and going of its inhabitants.

On account of this isolation it is necessary that towns be built where mines are opened. Factories, on the other hand, are erected where communities have been already established, and in such places there are persons outside the particular industry who make it a business to build and rent houses at the mine.

The houses must be erected in the beginning by those who develop the plant, for it is not to be expected that a workman will come to any place with enough capital to build his own house. Nor is it to be anticipated that he will invest in immovable property when the returns in that investment are dependent upon his retaining work in a certain mine.

Miners Prefer to Build Their Own Homes

Where in any community there are a number of mines run by different companies, so that a workman can feel reasonably sure of getting work in another place should he lose it in any one of them, then it will be found that he will build his own home, putting forth an effort to make for himself a place where he can live contentedly. And it will be generally found that where a man owns his residence, it is a better, cleaner place than when his dwelling is a house rented from a company. The change in some parts of the anthracite region with the disappearance of the rows of company houses is an instance of this.

The necessity which has led to the building of towns has often led to abuses in the end. For it is too easy to discover that money can be made on what has been invested in the houses.

It is true that no capital should be invested without a return being sought. But as the number of mines increases in any neighborhood, the opportunity for a workman to live in a house not owned by the company will increase. And thus when a man applies for work, the first question asked of him is, "You take house?" If he does not "take house" then he does not get work. And a superintendent who does not force the men to live in the company houses, no matter how badly out of repair they are, is likely to lose his job.

And as there is compulsion to make a man live in a company house the care of such houses is often neglected —more grievously than the man in charge of the houses often realizes himself. This is quite in contrast to the principle of merchandising good goods at a reasonable rate, which is the rule of a modern store. The temptation exists under these conditions to try to obtain a large return on the money invested in houses.

And the reaction from this manner of making money crops out in the mine. It spreads through all the intercourse between those who are trying to make money on an investment and those who are seeking to make money by their labor. When it becomes patent to the workmen that a good profit is being made at their expense in the renting of houses or any other line, they naturally resent it, and so in their work they "loaf" as much as they can in order to try to make up in one direction what they lose in another.

"Do others, for they do you," may be a first principle of business and one that may work out successfully for a merchant who deals only once with any one person, but as a principle for application in a mining community, where the intercourse between a company and its men is continuous and not only involves the man himself, but his family as well, it is false and unreliable. It is a principle from which only trouble can be expected and one that will cost money in the end.

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*The previous article is contained in the issue of July 10, 1915, pp. 48 and 49.

†Efficiency engineer, Scranton, Penn.

Some months ago a superintendent was telling what he was doing and boasting that he had all his houses rented. "You know," he said, "even my sand house is rented to two men." These employees may not have been able to express the feeling that the only interest the boss had in them was to make money out of them, and just as much money as was possible, but they felt it nevertheless. This thought affected not only those who lived in the sand house, but all the others—even those who may have been living in good houses. In return when any chance came to attack the company and turn the tables, it was entered into with joy.

Many people are discouraged because there is not an immediate response to any attempt they may make to do betterment work. The cleanliness of a New England village is a matter of long growth, and with the inhabitants of a mining village there are long years of neglect behind, in which prejudices have become fixed which can be eradicated only by living them down. A quick response is not to be expected and results cannot be hurried. They must grow.

Should Not Be Discouraged by Slow Results

It must be remembered that there is no encouragement for the men to respond. For the length of habitation of any man and his family is dependent upon the whim of a monarch—the boss. A man may be able to please the boss for years and hold his job, and yet again a mistake may arise the next week and he would lose it.

The house he lives in must then be vacated; so why make any improvements? They are fastened to the soil and cannot be moved when he is forced to go away. If he moves, his labor is wasted and will go to the next tenant, and in the next town to which he goes he will probably have to rent a dirty house and begin improvement work all over again.

Those who are trying to make their own mining communities better places for living and who feel discouraged may renew their flagging spirits with the thought that their numbers are continually increasing. But they will have to stand alone until the whole mass of the mining fraternity has for an extended time earnestly assumed its responsibilities, for such responsibilities it certainly does owe to the communities which are dependent upon the coal industry. By that time the distrust and irresponsiveness of the mine worker will disappear. Meanwhile, any individual operator if he would counterbalance the indifference of the rest, must work hard, for one cannot pass through a plague and escape infection from without except by taking unusual precautions.

Need for Mine-Workers' Union

Another cause for strikes is the desire for a recognition of the union. The desire of the men to confederate should be viewed in a different light from that which is now customary. There is a real need for some such organization as the United Mine Workers of America. It is not the first time in the history of our civilization that unions have existed. The Greeks and Romans were troubled with them and had to surrender to their importunities. The work in all the countries of Europe throughout medieval history was performed by unionized workmen, and English labor has been helped by them.

They have not always been known as unions. The organizations had other names or no names at all. At least the names of many of these bodies have not come down to us. The causes for which they struggled and the manner in which they were constituted have changed from age to age, but the underlying purpose is the struggle of the mass of the people for a better life. But as the desired ends were attained, the organizations have passed away only to become a memory. It will be the same with "the union."

It is interesting to note that in London in the year 1517—almost four hundred years ago—occurred "Evil May Day," which was so called because a strike riot occurred on that day for which 12 rioters (apprentices) were hanged and 400 more pardoned with the rope around their necks. But such doings did not remove the causes of discontent nor end the turmoil. An account written at the time gives the same causes for the riot as we find assigned for riots today. It says:

> Before May Day, poor handicraft people which were wont to keep shops and servants and had labour and living by making pins, points, girdles, gloves, and all such other things . . . had thereof sale and profit daily, until thirty years ago. . . . Many rich men is risen upon the destruction of the poor people, which poor people perceived themselves as having no living . . . not able to keep no houses . . . but in alleys sitting in a poor chamber working all the week to sell their ware . . . which would not give them so much winning for their wares to find them meat and drink.

And it is interesting, moreover, to know that among the other causes for the riot was a protest against foreign labor which was lowering the scale of living. Those who are working in mines are so close to the daily struggle that it is hard for them to get a perspective view of the situation. So it is excusable but nevertheless wrong for mine managers to condemn the union without qualification. It is true, the men blindly follow ignorant and self-seeking leaders and that those leaders become arrogant when they feel the strength of the union behind them. But the trouble is with individual men and not with the organization as a whole. The shoe is on the other foot when the unions condemn corporations. Corporations and unions are not animate things and are only as good as their thinking managers.

The basic desire underlying the formation of the United Mine Workers of America and the thing that holds it together is the desire of the individuals for a higher scale of living than they now possess and a chance to earn that living. When agreements between managements and men are in process of formulation this desire is given expression, in the form of one demand or another. But it is by playing upon the basic desire and by dressing it in different forms that the leaders hold the men together and can lead them to strike for the granting of their demands. But were these intense desires not there, the men could not be led into strikes.

Union a Nuisance and the Grievance Committee an Insult

The man at a mine generally looks upon the union as a nuisance and the grievance committee as an insult. The man in the nonunion districts can give orders without any explanation of why they are issued, nor does he have to worry if a man is idle for a week or so after his place is finished before he is given another. He does not have to trouble about the equal turn of cars. He can make the men live in the company houses and trade at the company store, no matter what treatment they receive.

The only recourse the men have is to go to some other place for work. It is a consummation of the idea that the boss is boss and what he says must go and go in a hurry. That is the principle of an absolute monarchy. But as monarchies in the state have gone down before democracies, so too it is now generally admitted that there is a growing democracy in work, though its realization is a long way off. Yet the man who will acknowledge this and give explanations of why he issues orders to a group of men is more likely to get along in peace with that group than he who tries to rule autocratically.

The grievance committee, instead of being considered an insult and a body of loafers about which to complain loudly, should rather be welcomed by any boss who is earnestly trying to treat his men with justice. He should regard it as a needful check upon himself and a guarantee that he will not fail to do his duty to all his employees. It is only too easy, as I know from experience, to forget this obligation and to neglect a man, leaving him without a place or opportunity to work.

The grievance committees are often composed of men with whom it is hard to argue. They may be and often are men who seek a place on the committee merely to further their own purposes. They may be loud-mouthed demagogues. That is not a basic fault of the union, and an attack should not be made on it in general, but upon the individual, efforts being made meanwhile to get honest men on the committees.

Operator Is Unheard Because He Says Nothing

When an agitation is being made in one direction it can only be met by one in the opposite direction. Too little of this is done. A mason's helper drifted into my office one morning on an idle day, and I talked with him. He told me about himself—that he was a socialist and a former member of the Industrial Workers of the World. I found he knew the works of Marx and Mills and others. In fact he was remarkably well-read. Telling me about meetings among the mass of workmen and how the I. W. W. sent out professional speakers, he said: "I go and argue against them. For what can these poor people do? They are ignorant and cannot prove that what is said is wrong. I go to the meetings and debate with them, and they listen to me and believe me." And he ended, speaking of the people in general, "They will listen if you speak to them."

That is it. No manager meets his workmen on a common plane. The commonly accepted philosophy of life says that one must hold one's dignity and be a boss rather than a leader of the men. We think that the men won't recognize one who is attempting to be a leader and will abuse his efforts. But it does not follow that when one relinquishes the position of autocratic boss, one softens one's muscles. The man who would lead needs more strength of character than a mere tyrant. A weak man will have more success as an autocrat than as a leader.

In the previous article I have spoken about the inequality of the miners' pay and the way it is reduced by an inadequate supply of mine cars. In this article I have discussed the house question and the attitude of the operators toward the union. These three elements in the relation between operators and men are bound up with one another and cannot be considered separately. If the questions that each raises are regarded with the same old philosophy of life—the philosophy of a chattering monkey swiping coconuts from his companions—no solution can be obtained. This is the philosophy that "business is business and the devil take the hindmost." It is the expression of the idea that no one can advance except at the expense of his fellowman.

But there are any number of good old proverbs that proclaim a different philosophy. E. H. Gary, of the United States Steel Corporation, announces a more reasonable doctrine in a recent number of *Harper's Magazine*, and it is to be hoped that his example will be followed throughout industry. Countries have been struggling for hundreds of years under the old negative philosophy which argues that capital should forbid labor a voice in its control, and with all their boasted progress they have to admit that the same demonstrations are repeated over and over again. Under a new active philosophy of labor betterment, better conditions are to be expected.

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Virginia Has Good Coal Year

The production of coal in Virginia in 1914 was 7,959,535 short tons, valued at $8,032,448. This was 868,533 tons less than in 1913, with a decline in value of $920,205, yet the output was greater than in any year previous to 1913, according to the figures compiled by C. E. Lesher, in coöperation with the Virginia Geological Survey, and just made public by the U. S. Geological Survey. The decrease in quantity was 9.8 per cent. and in value 10.3 per cent. and is attributed to the smaller demand from the iron business for coke. and to the smaller quantity needed to meet the requirements of the railroads and cotton mills.

For several years Virginia has stood relatively high in the quantity of coal produced by each man employed, and 1914 was no exception to the rule. The number of men employed in the coal mines of the state increased from 9162 in 1913 to 9183 in 1914, and the average working time decreased from 280 days to 235. The average production per man in 1913 was 964 tons and in 1914 was 868 tons. The average daily production per man was greater in 1914, being 3.59 tons against 3.44 tons in 1913.

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Coal Production in Oregon

In 1914 Oregon produced 51,558 tons of coal, valued at $143,556, an increase of 5495 tons over the output of 1913, according to the Geological Survey and the Oregon Bureau of Mines and Geology with which the Survey coöperates. The only productive coal field in Oregon is in the southwestern part of the state, in Coos County, and known as the Coos Bay field. Other coal fields have been prospected in different parts of the state, but none has been developed to the point of production. .

Coal production has never been one of the important industries of Oregon, and during the last few years has been of less importance than formerly because of the large increase in the production of petroleum in California and in its use as fuel. In only four years has the production exceeded 100,000 tons, and in each of the three years preceding 1914 it was below 50,000 tons.

Automatic Incline Devices

By Ralph W. Mayer*

SYNOPSIS—Some of the safety devices employed on a 4000-ft. slope of the Roslyn-Cascade Co.'s mine No. 1. These safety stops, derail switches, etc., are for the most part entirely automatic in action.

The Roslyn-Cascade Co., of which William McKay is general manager, lowers the coal from its mine No. 1 down an incline about 4000 ft. long, which crosses several gulches on high trestles and runs through several short tunnels to the tipple. As a runaway trip on this incline would do costly damage and be dangerous to human life, all possible safeguards have been adopted. In most cases these have been made to work automatically.

The loaded cars going down pull up the empties. The cable, at the top of the incline, passes several times around either half of a double drum placed horizontally. Strong brakes on these drums, both operated by one lever, regulate the speed at which the cars travel.

The shaft of a small engine, which is also used to hoist cars from the top of the incline into the mine, has a sliding miter-geared wheel, which can be thrown into mesh with a gear wheel, on the circumference of one of the drums, if it becomes necessary to use power for hoisting material up the incline.

A three-rail double track is used on the upper half of the incline, from the knuckle to the turnout where the trips pass each other.

Stop-Blocks Are Placed at the Knuckle

Automatic stop-blocks are placed at the knuckle. These are two in number—one in the middle of each track. Each stop-block is made from two timbers framed together side by side, one timber next each rail, and of the necessary strength to stop a runaway trip or car. These timbers move up and down vertically between the rails. Their ends are iron shod.

One heavy timber placed across and underneath the track on the upper side of these stop-blocks at their bottom end and another on their lower side directly underneath the rails prevents a runaway trip from moving them. The stop-blocks slide up and down against and between these timbers.

Several timbers placed lengthwise between the rails, and fastened with drift bolts to the ties, directly below the stop-blocks, materially strengthen them.

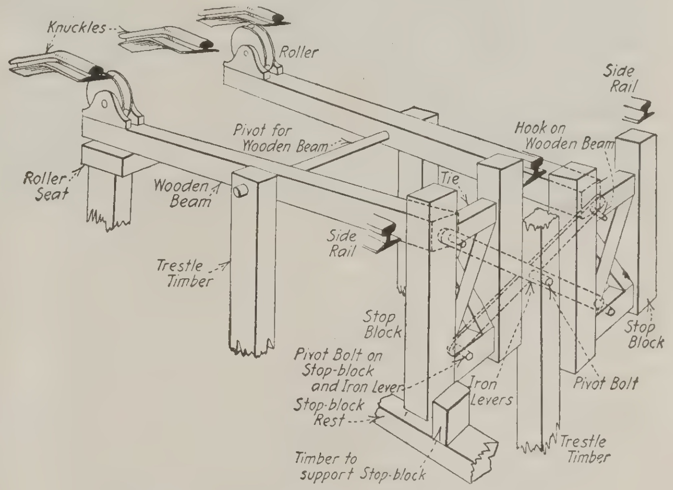
The stop-blocks are made to operate automatically by placing a roller for the cable on the knuckle between each track. The frame in which this roller revolves is set on the end of a 4x10-in. timber, about 6 ft. long, placed lengthwise with the track and underneath it. This beam is pivoted at its middle so that its ends are free to swing up and down, the pivoting bar being fastened to the timbers of the trestle underneath the knuckle.

A support or seat, underneath the end of the beam on which the roller is fastened, prevents it from dropping more than 4 or 5 in. and takes all the weight of the cable pulling down on the roller.

The other end of the beam is provided with an iron hook which engages the eye of an iron lever. This end of the beam is also weighted down by means of several old car wheels firmly clamped to it. The iron lever is placed crosswise to and reaches from center to center of the tracks. A pivot in its middle allows both ends to swing up and down.

The other end of this iron lever is pivoted by an iron bolt to the bottom of the stop-block frame, which is on the opposite track from the one under which the wooden beam and roller is placed. The up-and-down motion of the roller on the one track raises and lowers the stop-block on the opposite track.

The car-wheel weights on the end of the wooden beam must be sufficiently heavy to pull one end of the iron lever down and thus raise the stop-block which is fastened to the other end of this lever. When the roller is depressed by the downward pressure of the pulling cable, the stop-blocks are lowered. When there is no tension on the cable, the weights on the end of the wooden beam raise the roller and the stop-block on the opposite track.



STOP-BLOCK PLACED AT THE KNUCKLE

The levers, etc., under each track are duplicates. The iron bar on which the wooden beam swings must be placed a sufficient distance from the roller to allow the other end of the beam to swing far enough to lower the stop-blocks clear of the cars when the roller is depressed.

Rests are placed underneath the stop-blocks to hold them when they have been sufficiently depressed to clear the cars.

An Auxiliary Stop-Block Is Employed

An auxiliary stop-block is placed over the middle rail, above the automatic device. This is made by taking a 6x6-in. timber about 2 ft. long and hinging one end so that it will swing horizontally over the rail.

This piece of timber is well ironed. An iron pin passing through one end and down into a heavy tie furnishes the pivot upon which it may move. When it is swung across the rail, the other end comes in contact with the end of a timber or block thick enough to reach about 4 in. above the rail. This is laid lengthwise of the track and spiked to the ties. This holds the timber firmly in position across the rail for the car wheel to bump against.

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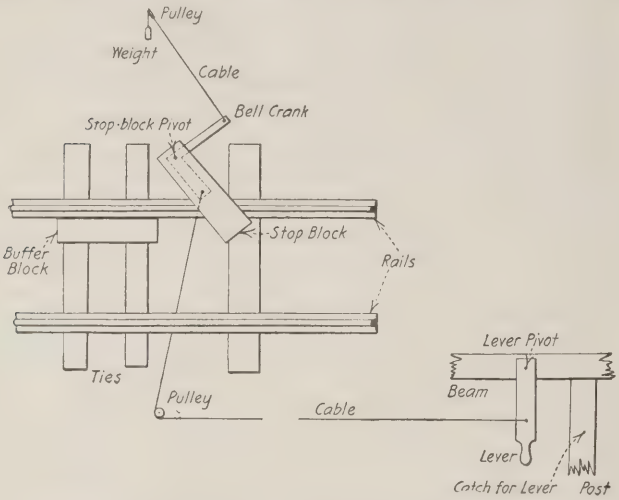
*Mining engineer, Roslyn, Wash.

A bell crank is fastened to the bottom of this pivoted timber on the pivoted end. From one arm of the bell crank a cable or chain passes to the side of the track and over a pulley. A weight is attached to the end of this cable, which holds the block off the top of the rail and parallel with it. From the other arm of the bell crank a cable passes to the other side of the track over a pulley and up to the top of the landing or parting. The cable crosses the track under the rails.



AUXILIARY STOP-BLOCK PLACED ABOVE KNUCKLE

At the upper end of the parting the cable is fastened to a lever. When it is desired to pull the stop-block across the rail, the lever is pulled and made fast by a pin or catch. The weight on the end of the cable pulls the stop-block off the rail as soon as the lever is released.

The cars are lowered out of the mine to the top of the incline landing on a single track by an engine placed at the mouth of the mine. At the end of this single track, where it connects with the top of the incline landing, a derail switch is kept open to handle runaways.

Bell cranks and iron rods lead to a lever placed beside the engineer in the engine room and give a positive motion to the switch, which he closes when a trip is hauled over it. The company has but few runaways, and all that occur are caught by means of these safeguards before they do any damage.

Lower End of Turnout Has a Self-Acting Switch

The upper half of the incline above the turnout where the two trips pass is a three-rail double track. The upper end of the turnout needs no switch. The two outside rails are spread the necessary distance apart, and the center rail branches Y-shaped into two rails, which are laid far enough apart to give the necessary clearance for the passing trips of cars, making a double track of four rails. From the lower end of the turnout to the tipple only a single track is laid. A switch is therefore necessary at the lower end of the turnout.

This switch is self-acting. The bridle of the latches is connected to an upright lever placed in a switch stand beside the track. Weights are placed on the top end of this lever, which moves from side to side as the latches are moved from one side to the other by the descending trips. The weight holds the lever down and the latches in place on the one side until the trip goes up. The next trip descends on the other track and throws the latches over, pulling the lever with its weight over also. The weighted lever again holds the latches in place for this track and for the next ascending trip.

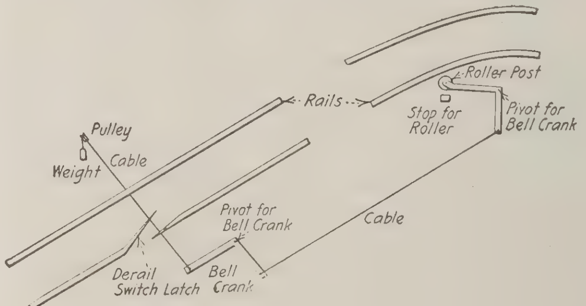
The single track has an automatic derail switch at its lower end near the tipple. At a distance equal to about two trip lengths above the derail switch the track makes a slight curve, which necessitates a roller post to keep the cable from swinging off the incline.

This guide roller is about 18 in. long and is set vertically and mounted on the end of the arm, about 6 ft. long, of a bell crank. The roller is placed on the lower end of the arm, and the upper end is pivoted to a tie or some other suitable support.

The other bell-crank arm extends out at right angles to the track. A small cable or wire is fastened to the end of this arm and extends down the incline to the derail switch, where it is made fast to the arm of another bell crank extending at right angles to the track. This crank is also pivoted to a long tie or suitable support. The other arm of this bell crank, extending down the incline, is connected by a short cable to the derail switch. The cable is continued across the track to the opposite side, where it passes over a pulley, a weight being attached to pull the switch open.

When the trip is below the roller post, carried on the bell crank at the curve, the hoisting rope presses against the roller, which being free to move, operates the bell cranks and cable, thus holding the derail switch firmly closed as long as the trip is below the roller post and the rope is in tension.

In order that the sidewise motion of the roller will not be more than is necessary to operate the switch, a stop or seat is placed back of it to prevent it from going too far. Where a roadbed is on a level with the ground, in order to hang the weights on the ends of the cable wells may be dug a few feet deep and about a foot square and curbed up with planks or the cable may be carried under a pulley at the side of the road and up several feet over another pulley fastened between two uprights, the weights being attached to the end of this cable.



DERAIL SWITCH NEAR TIPPLE

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That the Demand for Cheap Coal by manufacturers and the public generally can be carried too far has been often demonstrated. The sacrifice of life and limb in the colliery districts makes this abundantly clear. No one denies that competition can become so keen as to lead to the occurrence of accidents, for what applies at works on the surface must hold good, to even a greater degree, down the mine in the bowels of the earth. If only the miner could attend more leisurely to his task of getting the coal it is possible there would not be so many accidents, but the modern conditions are against him in this respect. As things are, it often happens that one miner is anxious to get more coal than his neighbor, and in course of time he may pay the penalty of haste.

Meeting of the Alabama Coal Operators' Association

The sixth annual meeting of Alabama coal-mine officials was held under the auspices of the Alabama Coal Operators' Association at the Edgewater mines of the Tennessee Coal, Iron & R.R. Co. on Saturday, July 10, 1915.

The program as given out—which was published in *Coal Age* of July 3—was carried out to the letter, except that two extra features were added. First, Dr. Lloyd Nolan, superintendent of the Department of Health of the Tennessee Coal, Iron & R.R. Co., gave an impromptu talk following the motion pictures illustrating "The Fly Pest" and "War on the Mosquito." Second, demonstrations were given in an explosion gallery to show the comparative action of safety explosives and black powder when fired in the presence of dust.

TAKING A PHOTOGRAPH OF THE MEMBERS WITH A REVOLVING CAMERA

The prepared papers will be published in full or in part in future issues of *Coal Age,* so no comments on them are necessary; but the remarks of Dr. Nolan, being impromptu, call for discussion.

To begin with, Dr. Nolan did important work in sanitation at Panama, so he speaks with authority. In addition to that he has already accomplished much by his work in Alabama. He has the gift of being able to cover his subject fully and in a convincing manner by simply making a few startling statements. Here are a few of them, quoted from memory:

"Ninety-five per cent. of all flies are bred in stables. If all stables were cleaned out daily, the wet manure being either spread out on the ground to dry or treated with borax or sulphate of iron, flies would become curiosities. Even if all manure were hauled out weekly and burned, the same statement would be true."

A manager sitting next to the writer remarked that henceforth his stableman would have little idle time on his hands. He probably expressed in words what most of the managers present were silently thinking.

Then for fear that some of his audience might think he was indulging in figures of speech, Dr. Nolan added that the records at Panama bore out his statement.

Since all flies are not liable to be exterminated in the near future, the next statement had to do with the possibility of rendering flies harmless.

"Make all water-closets flyproof if you want to render most flies harmless," was the way the Doctor expressed it. Just to show that such a water-closet can be built,

LUNCHEON AT BAYVIEW BEFORE RETURNING TO EDGEWATER there was one on exhibition just outside of the hall, and during the interim between the morning and the afternoon sessions most everyone present inspected it.

Dr. Nolan closed his case against the fly by stating that in his opinion typhoid fever would almost disappear from the health statistics of Birmingham if all of the 20,000 open closets could be done away with, and he based his conclusion on the fact that both the water supply and the milk supply in the city are far above the average.

His treatment of the mosquito was quite as impressive. He stated that there are two kinds of mosquito in Alabama—the Anopheles, which is the dangerous one, and the Culex or house mosquito, which is harmless. The Anopheles is the villian that is responsible for most of the malaria in Alabama. The Tennessee Coal, Iron & R.R. Co., acting under Dr. Nolan's directions, has proved the truth of that statement by reducing the number of Anopheles, and likewise reducing the number of cases of malaria. Getting rid of mosquitoes is the simplest thing in the world. Get rid of all stagnant water, and if you can't get rid of it, cover the surface with oil. Everyone knows that; but most people have lakes in mind, when as a matter of fact rain barrels and empty tin cans cause a good deal of the trouble.

A LINEUP OF THE ALABAMA COAL OPERATORS' ASSOCIATION IN FRONT OF THE EDGEWATER TOWN HALL

Dr. Nolan's talk carried conviction. It now remains to be seen whether it will inspire action.

Taken all in all, the meeting was one of the most instructive that the association has ever held, and it was also very satisfactory from the standpoint of attendance. Priestley Toulmin, president of the Lehigh Coal Co., presided over the meeting, and Frank Crockard, vice-president of the Tennessee, Coal Iron & R.R. Co., assumed the rôle of "spieler" when the guests started out to inspect the mining equipment at Edgewater.

Chicago Convention of the Ko Koal

The national coal convention and tenth anniversary of the Order Ko Koal opened at the Auditorium Hotel, Chicago, on Monday afternoon, July 12. The meeting was one of the most important in the history of the order. Out of it there will probably grow a national organization to promote business and social relations in the coal trade of the country and to disseminate to the public and other business organizations facts and figures acquainting them with the actual situation of the fuel industry.

In his address of welcome President Charles L. Dering, of the Chicago Association of Commerce, and well known in the anthracite coal trade as the manager of the D., L. & W. interests in the West, urged the organization of a national coal association. He pointed to the need of such an organization, and declared that business men are regarded in a new light today. There was a time not long ago when business was represented in legislative halls only by seekers of special privilege; but a radical change has taken place in public sentiment and business now deals openly and squarely, and pleads its case on the merits of its cause.

Mr. Dering pleaded for a cessation of the bickerings and jealousies in the coal trade and advocated the formation of a national organization of dealers so that the trade may better work out its salvation through special committees. He strongly urged that the body form an organization which would stand for something and not for horseplay and unnecessary frivolity. In this connection he said: "The present is a time of changed ideas. Business today views without alarm so momentous an innovation as the establishment of the Federal trade commission. A few years ago such a departure in national affairs could only have been regarded as a menace—a blow to the inalienable rights of business to work out its own salvation."

Resolutions Adopted

A resolution was adopted, reading in part as follows:

That the Order of Ko Koal be continued in fact, and that all horseplay be eliminated and absolutely prohibited from all of its initiatory ceremonies.

That in every program given under its auspices educational features must predominate.

That a bureau be established to collect, prepare and disseminate facts and figures covering cost of production, distributing and retailing of the various grades of coal from the mines to the consumer, in order to show the less-informed members of the trades as well as the consumer what constitutes a reasonable price for coal in different sections of the country.

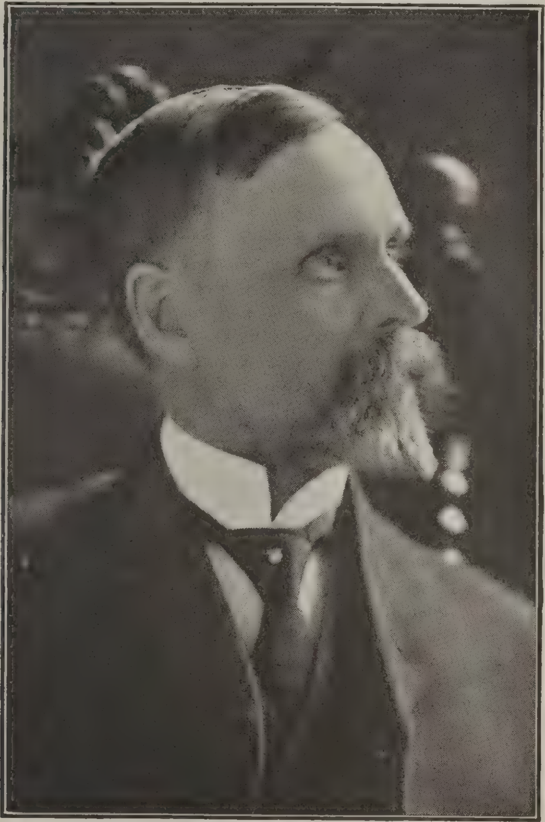
That plans be formed to present this information to local chambers of commerce, business-men's associations and in other ways to promote the best interests of all branches of the coal industry.

At the banquet, which was held at 6:30 in the evening at the Auditorium Hotel, the suggestion of Mr. Dering that the body form a national organization was enthusiastically adopted. F. S. Peabody presided, and among the speakers were Homer D. Jones, of Chicago, Charles F. Kerchner, of Baltimore, and H. C. McKinney, of Kansas City. President C. M. Moderwell of the Illinois Coal

Operators' Association delivered a very interesting address, his subject being "The Advantage of a Definite Aim." Walter S. Bogle, dean of Chicago coal men, in dwelling on his subject, "How Selling Prices Kept Up with Rising Costs," stated that the public has no idea of the number of coal companies now in bankruptcy, and that the profits of coal operators are decreasing each year owing to increased cost of labor, liability insurance and other factors little known by the public, which has increased the cost of operations.

Death of Charles C. Rose

The coal-mining industry has lost one of its oldest and most widely known colliery officials in the death of Charles C. Rose, general superintendent of the Delaware & Hudson Co., on Saturday, July 17. Mr. Rose would have celebrated his 78th birthday on Sunday last, and although recently he did not enjoy robust health, his illness was not considered serious until about eight weeks ago.



CHARLES C. ROSE

He was born at Rose Points, near Port Jervis, N. Y., of old New England stock, his ancestors being among the first Puritans who settled in this country. When 14 years of age Mr. Rose accepted a position with his father's firm, leaving it a short time later to enter the employment of the Erie R.R. While holding the latter position he took up the study of engineering, and through this preparatory work secured a position as civil engineer with the New Jersey Midland R.R. Co. His next connection was with the Delaware & Hudson Co. on operations in the vicinity of Lake Champlain.

In 1882, after having completed work for the Delaware, Lackawanna & Western Co. in the construction of a new railroad line west of Binghamton, N. Y., Mr. Rose moved to Scranton and became assistant chief engineer for the D., L. & W. Co. He continued in the employ of this company until 1896, when he was offered a position as assistant superintendent of the Delaware & Hudson Co.'s coal mines. One year later he was advanced to the important post of general superintendent of all the coal-mining operations of the D. & H. Co., and continued to serve in that capacity until the time of his death.

Mr. Rose was married twice. He had one son by his first wife and one by his second wife. Both sons and his wife, Emma B. Rose, survive him.

Mr. Rose was a quiet, unassuming man who avoided publicity at all times. He succeeded in advancing himself to a place of eminence in the anthracite industry. As a mark of unusual respect for the man who rendered so many years of faithful service all the Delaware & Hudson collieries were closed at noon on Monday of this week. A host of friends, most of them old employees, attended the funeral.

American Coal Sold in Sweden

Through the efforts of the consulate-general the Swedish state railways have purchased 100,000 tons of West Virginia coal, says Consul-General Ernest L. Harris, of Stockholm, Sweden, in *Commerce Reports.* Including the purchases in February, the total amount of American coal recently sold to the Swedish state railways is 120,000 tons. Private industrial enterprises in Sweden also use large quantities of coal. Sweden consumes over 4,000,000 tons of coal annually, chiefly coming from England, which has put an embargo on coal.

Recent Legal Decisions

Duty to Safeguard Setscrew on Shaft—In a suit for injury to a 19-year-old boy whose arm was caught by a setscrew on a revolving shaft while he was attempting to tighten a takeup on a jig shaft at a colliery, it was a question for the jury to determine whether defendant coal company was negligent in failing to box or guard the shaft. (Pennsylvania Court of Common Pleas, DeCrisse vs. Lehigh Valley Coal Co., 43 Pennsylvania County Court Reports 126.)

Enforcement of Mining Contracts—If a contract for removal of coal from a mine gives the owner of the mine the right to indefinitely postpone operations, there is such want of mutuality of obligation that the agreement can be terminated at the will of either party. If the contract is silent as to the time for its performance, the law presumes that the parties intended that it will be performed within a reasonable time, considering all the attending circumstances. The terms of a written contract cannot be contradicted by showing a trade custom at variance with such terms. (Alabama Supreme Court, Pratt Consolidated Coal Co., 68 Southern Reporter, 63.)

Assumption of Risk by Miner—If a dangerous condition in a mine resulting from props being placed too close to a track was obvious, a miner assumed the risk of being injured in consequence of that condition. (Kentucky Court of Appeals, Walker's Administrator vs. Bon Jellico Coal Co., 175 Southwestern Reporter 628.) Although an experienced miner was injured through fall of slate in a room neck wherein he was engaged in blasting down and removing coal after the same had been cut under by other employees, he cannot recover damages against his employer if it was his own duty to inspect the roof as the work progressed to ascertain its safety and if he had just blasted down coal under the slate which fell. In such circumstances he had the best opportunity to determine the safety of his working-place. (Same court, Stratton vs. Northeastern Coal Co., 175 Southwestern Reporter 333.)

New York City's New Coal Specifications

SYNOPSIS—An analysis of the new specifications to be adopted shortly. The tonnages purchased under this plan aggregate half a million. The specifications have been evolved from years of experience and careful study. The main changes are in anthracite coal, in which radical readjustments have been made.

New York City coal men will be interested in the new set of specifications under which it is proposed to purchase all coal intended for use in the various city departments of Greater New York, amounting to more than half a million tons. These new specifications have been prepared after three months' careful thought and work by a special committee of representatives of the largest coal-using departments, who have collaborated with the Bureau of Standards of the Board of Estimate and Apportionment.

A RADICAL CHANGE IN THE BUCKWHEATS

The most important change in the specifications has been made in the table of analysis. Of these changes the ash per cent. allowed for No. 3 buckwheat stands out most prominently, this having been reduced from 19 to 16 per cent. In view of this and other changes, the Bureau of Standards has seen fit to reverse the order of these sizes, placing No. 3 first on the list of buckwheat coals and Nos. 2 and 1 following in the order named. In changing the ash percentages for the buckwheat coals the committee sent out special investigators and learned that large individual users of these coals, especially No. 3, were able to obtain coals giving a 14 per cent. ash with from 13,900 to 14,000 B.t.u., while the city was being supplied with coals giving from 18 to 23 per cent. ash and running from 11,500 to 11,900 B.t.u.

In view of the fact that the various city departments in 1914 used 124,000 tons of No. 1 buckwheat, 20,499 tons of No. 2 and 62,517 tons of No. 3, the committee determined to devise a method for getting a better quality of this grade and therefore raised the standards. It was also learned, according to the committee, that the city was paying from 15c. to 25c. more per ton for its No. 3 buckwheat coal than certain individuals were paying, although the latter, it is claimed, were getting a better quality of fuel.

It has been decided that if a sufficient supply of these smaller coals can be obtained, wherever possible they shall be substituted for the larger and more expensive grades.

NEW ANALYSIS AND BONUSES

The table of analysis in the new specifications is as follows:

Sizes	Moisture*	Ash†	Volatile†	Sulphur†	B.t.u.†
Broken	4	9	9	1.5	13,500
Egg	4	11	9	1.5	13,200
Stove	4	12	9	1.5	13,000
Chestnut	4	12	9	1.5	13,000
Pea	5	16	9	1.5	12,400
Buckwheat No. 3....	6	16	9	1.5	12,400
Buckwheat No. 2....	6	18	9	1.5	12,200
Buckwheat No. 1....	6	18	9	1.5	12,200

*As delivered. †Dry coal.

The table of analysis in the former specifications, which have been in force for more than four years, is as follows:

Sizes	Moisture*	Ash†	Volatile†	Sulphur†	B.t.u.†
Broken	4	11	8	1.5	13,200
Egg	4	11	8	1.5	13,200
Stove	4	12	8	1.5	13,000
Nut	4	12	8	1.5	13,000
Pea	4	12	8	1.5	13,000
Buckwheat No. 1....	6	18	8	1.5	12,200
Buckwheat No. 2....	6	19	8	1.5	12,100
Buckwheat No. 3....	6	19	8	1.5	12,000

*As delivered. †Dry coal.

In providing for the "Correction of Ash" the specifications say:

For each 1 per cent. of ash in the broken size in excess of the standard of 9 per cent. and up to and including 11 per cent., the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 1 per cent. of ash in excess of 11 per cent. the gross weight of coal shall be reduced at the rate of 2 per cent.

For each 1 per cent. of ash in the egg size in excess of the standard of 11 per cent. and up to and including 13 per cent. the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 1 per cent. of ash in excess of 13 per cent. the gross weight of coal shall be reduced at the rate of 2 per cent.

For each 1 per cent. of ash in stove and chestnut sizes in excess of the standard of 12 per cent. and up to and including 14 per cent. the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 1 per cent. of ash in excess of 14 per cent. the gross weight of coal shall be reduced at the rate of 2 per cent.

For each 1 per cent. of ash in the pea and buckwheat No. 3 sizes in excess of the standard of 16 per cent. and up to and including 18 per cent. the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 1 per cent. of ash in excess of 18 per cent. the gross weight of coal shall be at the rate of 2 per cent.

For each 1 per cent. of ash in buckwheat No. 1 and buckwheat No. 2 sizes in excess of the standard of 18 per cent. and up to and including 20 per cent. the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 1 per cent. of ash in excess of 20 per cent. the gross weight of coal shall be at the rate of 2 per cent.

Reductions in the gross weight of coal for excess ash above the standard of 9 per cent. for broken sizes, up to and including 11 per cent. in excess of the standard of 11 per cent. for egg size, up to and including 13 per cent. in excess of the standard of 12 per cent. for stove and chestnut sizes, up to and including 14 per cent. in excess of the standard of 16 per cent. for pea and buckwheat No. 3 sizes, up to and including 18 per cent. and in excess of the standard of 18 per cent. for buckwheat No. 1 and buckwheat No. 2 sizes, up to and including 20 per cent. in deliveries, shall be offset by remitting such reductions made on the 1 per cent. basis at the rate of 1 per cent. for each 1 per cent. on the amount of coal in other deliveries under the same contract at the same unit price which contains ash below the standards of 9 per cent. for broken size, 11 per cent. for egg size, 12 per cent. for stove and chestnut sizes, 16 per cent. for pea and buckwheat No. 3 sizes and 18 per cent. for buckwheat No. 1 and buckwheat No. 2 sizes. No deductions made on the 2 per cent. basis shall be remitted. The percentages of ash shall be computed to the nearest tenth of a per cent. All such remissions of reductions in the gross weight of coal shall be made upon the final payments under contracts for coal delivered.

THE CORRECTION FOR THE B.T.U. VALUE

In the specifications which will be superseded it is provided that "the gross weight of coal after correction for excess of moisture shall be reduced at the rate of 1 per cent. for each per cent. of ash in excess of the standard analysis specified for the particular kind and size of coal delivered."

In the correction for deficiency in B.t.u.'s the specifications provide as follows:

For each 100 B.t.u. in broken size below the standard of 13,500 B.t.u. per lb. of dry coal and down to and including

13,200 the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 100 B.t.u. below 13,200 the gross weight of coal shall be reduced at the rate of 2 per cent.

For each 100 B.t.u. in egg size below the standard of 13,200 and down to and including 12,900 the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 100 B.t.u. below 12,900 the gross weight of coal shall be reduced at the rate of 2 per cent.

For each 100 B.t.u. in stove and chestnut sizes below the standard of 13,000 and down to and including 12,700 the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 100 B.t.u. below 12,700 the gross weight of coal shall be reduced at the rate of 2 per cent.

For each 100 B.t.u. in pea and buckwheat No. 3 sizes below the standard of 12,400 and down to and including 12,100 the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 100 B.t.u. below 12,100 the gross weight of coal shall be reduced at the rate of 2 per cent.

For each 100 B.t.u. in buckwheat No. 1 and buckwheat No. 2 sizes below the standard of 12,200 and down to and including 11,900 the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 100 B.t.u. below 11,900 the gross weight of coal shall be reduced at the rate of 2 per cent.

In order that the successful bidder shall be reimbursed should some of his deliveries exceed the quality called for by the contract, the specifications say that reductions in the gross weight of coal for deficiencies in B.t.u. below the standards specified in the paragraphs relating to correction for deficiency shall be offset by remitting such reductions made on the 1-per cent. basis at the rate of 1 per cent. for each 100 B.t.u. that coal in other deliveries under the same contract at the same unit price contains B.t.u. in excess of the standards set forth in the table of analysis. No deductions made on the 2-per cent. basis shall be remitted. The deductions in B.t.u.'s shall in every case be computed to the nearest 50 units.

Corrections for Gross Weight

The former specifications simply provided that the gross weight of coal, after correction for excess moisture, should be reduced at the rate of 1 per cent. for each 100 B.t.u.'s below the standard heating value specified in the analysis for the particular kind and size of coal delivered.

In providing for the aggregate reductions in gross weight the specifications read as follows:

After the correction for excess moisture shall have been made as herein specified, all percentage in reductions as herein described to be made on account of a deficient number of B.t.u. per pound, and all percentage in excesses of ash, volatile combustible matter and volatile sulphur shall be aggregated and totalized, and shall be deducted as a whole, and each payment shall be made only for the balance of the gross weight of coal delivered at the price bid per unit, except that, before the final payment is made under a contract, deductions in the gross weight of deliveries of 1 per cent. made for deficiencies in B.t.u. as herein described shall be offset by remitting such deductions at the rate of 1 per cent. for each 100 B.t.u. that coal in other deliveries under the same contract at the same unit price exceeds the standard given herein, and that deductions in the gross weight of deliveries of 1 per cent. for excess of ash as herein described shall be offset by remitting such deductions at the rate of 1 per cent. for each 1 per cent. that the amount of coal in other deliveries under the same contract at the same unit price contains ash below the standard given here. The total offsetting tonnage shall never exceed the tonnage deductions on the 1 per cent. basis for ash and B.t.u., nor shall offsetting tonnage on coal at one unit price be remitted from reductions on coal at a different unit price. Deductions made for excess moisture, volatile combustible matter and volatile sulphur shall not be remitted.

Changes in Semi-Bituminous

The changes provided for the purchase of semi-bituminous coal are not so pronounced, as can be seen by a comparison of the tables of analysis in the new specifications and in the old, as shown in the following tables:

NEW

Sizes	Moisture*	Ash†	Volatile†	Sulphur†	B.t.u.†
Run-of-mine	3	9	25	2	14,000
Lump	3	9	25	2	14,000
Chestnut	3	9	25	2	14,000
Slack	3	11	25	2	13,600

OLD

Sizes	Moisture*	Ash†	Volatile†	Sulphur†	B.t.u.†
Run-of-mine	3	10	25	1.75	13,800
Lump	2.5	9	25	1.5	14,000
Chestnut	2.5	9	25	1.5	14.000
Slack	3	11	25	1.75	13,600

*As delivered. †Dry coal.

CORRECTION FOR ASH

The gross weight of coal, after the correction for excess moisture, shall be reduced as follows:

For each 1 per cent. of ash in run-of-mine, lump and chestnut sizes in excess of the standard of 9 per cent. and up to and including 12 per cent. the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 1 per cent. of ash in excess of 12 per cent. the gross weight of coal shall be reduced at the rate of 2 per cent. For each 1 per cent. of ash in slack size in excess of the standard of 11 per cent., and up to and including 13 per cent., the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 1 per cent. of ash in excess of 13 per cent. the gross weight of coal shall be reduced at the rate of 2 per cent.

Reductions in the gross weight of coal for excess ash above the standard of 9 per cent. for run-of-mine, lump and chestnut sizes up to and including 12 per cent. and in excess of the standard of 11 per cent. for slack size up to and including 13 per cent. in deliveries shall be offset by remitting such reductions made on the 1 per cent. basis at the rate of 1 per cent. for each 1 per cent. on the amount of coal in other deliveries under the same contract at the same unit price which contains ash below the standard of 9 per cent. for run-of-mine, lump and chestnut sizes and below 11 per cent. for slack size. No deductions made on the 2 per cent. basis shall be remitted. The percentages of ash shall be computed to the nearest tenth of a per cent. All such remissions of reductions in the gross weight of coal shall be made upon the final payments under contracts for coal delivered.

Method of Weighing Bituminous

The old specifications simply provided that the gross weight of coal, after the correction for excess of moisture, should be reduced 1 per cent. for each per cent. of ash in excess of the amount allowed in the standard analysis specified for the particular kind and size of coal delivered and that the percentage of ash should be computed to the nearest tenth of a per cent.

To establish the gross weight after correction for excess moisture the specifications provide that:

For each 100 B.t.u. in run-of-mine, lump and chestnut sizes below the standard of 14,000 B.t.u. per lb. of dry coal, and down to and including 13,500, the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 100 B.t.u. below 13,500 the gross weight of coal shall be reduced at the rate of 2 per cent. For each 100 B.t.u. in slack size below the standard of 13,600 and down to and including 13,300 the gross weight of coal shall be reduced at the rate of 1 per cent., and for each 100 B.t.u. below 13,300 the gross weight of coal shall be reduced at the rate of 2 per cent.

Reductions in the gross weight of coal for deficiency in B.t.u. below the standard of 14,000 for run-of-mine, lump and chestnut sizes down to and including 13,500, and below the standard of 13,600 for slack size down to and including 13,300 in deliveries, shall be offset by remitting such reductions made on the 1 per cent. basis at the rate of 1 per cent. for each 100 B.t.u. that coal in other deliveries under the same contract at the same unit price contains B.t.u. in excess of the standard of 14,000 for run-of-mine, lump and chestnut sizes and in excess of the standard of 13,600 for slack size. No deductions made on the 2 per cent. basis shall be remitted. The deductions for deficiencies in B.t.u. shall be computed to the nearest 50 units. All such remissions of reductions in the gross weight of coal shall be made upon the final payments under contracts for coal delivered.

How premiums may be secured by the delivery of coal in excess of the requirements of the contract is provided for as in the specifications relating to anthracite coal.

The Labor Situation

SYNOPSIS—Much interest centers around the meeting of District No. 1 at Scranton, Penn. The radicals there, as in West Virginia and Illinois, are disposed to break up the union. The South Wales strike appears to be settled, the men receiving a further increase in wage. The Munitions Act was powerless to restrain the strikers.

The miners in District No. 1 of the United Mine Workers of America who assembled on July 19 at Scranton, Penn., were jubilant over the condition of the union. There are 43,000 members in that district, with a cash balance in the treasury of $81,000, which is only about $1.89 for each member, and even less for each mineworker in the district. The union lists show an increase of 8000 since 1913.

There are members and enthusiasm, but there is little money; and it is a safe guess to state that the miners will get little more than the operators are prepared to concede them, for the miners elsewhere will hardly be able to contribute much owing to the slack work in the past.

However, there is no reason why concessions should not be received in the direction of the 8-hour day and perhaps recognition of the union—for the first has popular approval and the second, as far as the anthracite region is concerned, would probably be a guarantee of greater industrial peace, and therefore acceptable to the operators. The abolition of the conciliation board will not meet with public approval, though the fight is largely about names. Any other board would be but little different from that now sitting.

Method of Measurement Is a Cause of Discontent

The miners object to the arrangement which the Pennsylvania Coal Co., the Hillside Coal & Coke Co., and the Delaware & Hudson Co. have with their men, whereby a ton is rated at 2700 lb., that being supposed to net 2240 lb. after cleaning. There is a rebate if the coal gives a better result, and that rebate is usually received. The miners object to payment by the car where that is the system, and a change is likely to be urged by the union.

The miners have not by any means the unanimity which might be expected. A disruption is feared by the leaders, and the need for solidarity will be urged on the delegates. There is a radical element which is content with nothing. This element prefers the methods of the Industrial Workers of the World to the orderly methods of the union.

An Increase in Wage Demanded at a Pennsylvania Mine

The coal miners of the Shenango Furnace Co., at Wilpen, in Westmoreland County, Penn., went on strike on July 12 for an increase in wages of 10c. per ton. The company complained that the miners did not load their cars as high above the sides as they should, and the miners countered with the demand for higher wages. About 100 men walked out when the claim was not met. The company stated that it had a contract for a year calling for 950 tons per day and that it could only be filled at the present scale of wages. The records show that in 1913 this mine had 250 employees and the production was about 1000 tons per day.

Strikes for Run-of-Mine Weighing in Eastern Ohio

In Ohio the miners are discontent at the slowness with which mine-run weigh scales are being installed. The employees claim that the operators prefer to continue the temporary arrangements by which the slack produced is estimated and added to the weighings of the lump coal. About 2000 miners in Belmont County, Ohio, have gone on strike. It is not likely that the trouble will continue, as the operators are installing scales which will enable them to weigh the coal as it comes from the mines.

At Nelsonville, Ohio, the Manhattan Coal Co. has closed down two of its mines because some of its employees refused to accept a reduction in wages. About 500 men are idle. In 1913 the Manhattan Coal Co. had 825 employees. Its mines are in the Hocking Valley district, where the Sunday Creek Co. has recently closed all its mines.

In the eastern Ohio district conditions are better. Since the strike about 30 mines have gone to work and others are preparing to resume. The Maher mine of the Purseglove-Maher Coal Co. at Glencoe, which employs about 200 men, and the Johnson Coal Co. mine at Pipe Creek (Dilles Bottom P. O.), employing about as many, resumed work on July 15.

Dissension in Cabin Creek Labor Unions

Dissension has arisen in the unions in West Virginia and Illinois. On the failure of the district convention in Charleston, to sustain by its vote the charges of fraud in union elections, brought against certain officials of the union by Cabin Creek miners, a number of delegates from that district bolted the convention, declaring their intention of forming an independent union. It is reported that only 40 of the 63 delegates who advocated sustaining the charges left the meeting, and that they represent only a small number of the Paint and Cabin Creek miners; but the independents have called for a general convention to be held at Montgomery on Aug. 2, at which time a show of strength will be possible. Sweeping charges of questionable methods and machine politics on the part of present union officials are made by the independents.

Some further details of this dispute can be found in "Coal Age" of July 3. It is there stated that Thomas Haggerty was accused of using the funds of the union to secure the election of L. C. Rogers and his associates, but was exonerated by the International Executive Board.

A New Local Union of Moderates at O'Fallon, Ill.

A new local miners' union was organized on Friday, June 24, at O'Fallon, Ill., composed of dissatisfied members of the local United Mine Workers Union. The president of the local thus suffering from dissension is David Wilson. He is known as "King David." It is alleged that the socialists in the union, who compose 60 per cent. of the membership, have caused discrimination to be shown to their followers in apportioning work. The nonsocialists claim that there has been so much unrest and dissatisfaction among the miners that the companies could not operate to advantage and so have been running irregularly. They want to get back to work and have elected George Goodall president, Martin Gurney vice-president and several other officials to plan for peace and progress.

Violence Attempted at Fairmont, W. Va.

Three men were arrested at Fairmont, W. Va., on July 17 charged with plotting to dynamite the residence of former United States Senator Clarence Watson and three of his relatives, who are heads of the Consolidation Coal Co. The plot is generally thought to be due, not to labor troubles, for there are none, but to the fact that the company has been shipping coal to Great Britain and her allies. The men were arrested on the testimony of Roy Dunn, a 16-year-old boy, who while concealed heard the men discussing the plot. He was discovered by the plotters, who bound him and threw him into the Monongahela River, from which he barely escaped with his life. A suitcase full of dynamite was later found by officers near where the men had held their conference.

A Miner and Labor Leader in a King's Cabinet

It is interesting to note that William Brace, who began his career as a pit-boy in a Welsh coal mine at the age of 12 and worked as a miner for 12 years, has entered the new coalition cabinet in Great Britain as Under-Secretary of Home Affairs. Of course promotion even higher for representatives of labor is even commoner in Great Britain than it is here. Brace was a talented organizer, and it was largely owing to his efforts that the South Wales Miners' Federation was formed, of which he ultimately became president.

He did much to ally this body with the Miners' Federation of Great Britain. He entered Parliament in 1906 as a member of the Labor party. He is 50 years of age. He often preaches in the Baptist church. He looks more like a successful businessman than a miner, but he has not lost his democratic instincts or his sense of comradeship with those who have helped him to his present position.

South Wales Strike Is a Protest Against Munitions Act

The difficulty in South Wales, which appears at present writing, July 21, to be settled, is a political issue rather than a contest between capital and labor. The miners are striking at the Munitions of War Act, which compels them to accept arbitration and forbids them to strike under a penalty of a fine of about $25 per day for each day of idleness. Their leaders, who have a broader knowledge of the situation than the miners, and who can stand off and view the war conditions comprehensively, have for the most part been trying to get the men back to work. So has the Federation of Miners of the United Kingdom. The labor leaders, at the recommendation of Lloyd George, Minister of Munitions, have agreed to settle the strike if granted a further increase of 10 per cent. in wages and other important concessions.

New Apparatus and Equipment

Safety Check Hook and Lock

At practically all coal mines of any size in the United States the check system has been adopted as a means of identifying the coal produced by the different miners. Each coal digger or loader is given a certain number of brass checks bearing his work number. He attaches one of these to each car that he loads out. When the car is dumped the check is removed and the coal which the car contained is credited to the man whose check it bore.

Much trouble has resulted from "stealing of cars"—that is, the removal of the rightful check and the substitution of another. By this means an unscrupulous miner may often get credit and receive payment for many cars of coal that he did not dig. It has been estimated that, taking the country as a whole, each miner will average the loss of one car each month through this form of petty thievery. Furthermore, not infrequently a check becomes detached from its proper hook or nail and is lost; in which case of course the car of coal cannot be credited to the proper person.

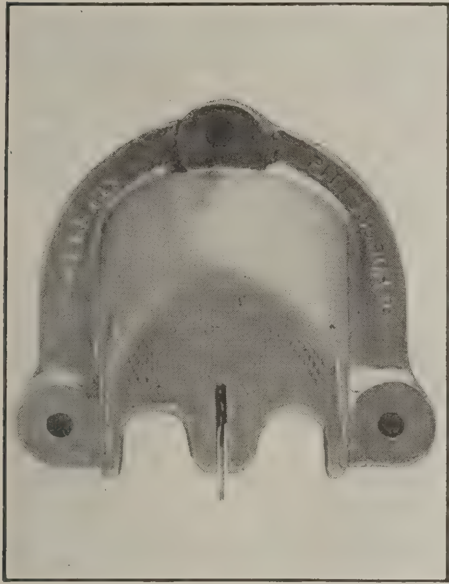


FIG. 1. FRONT VIEW

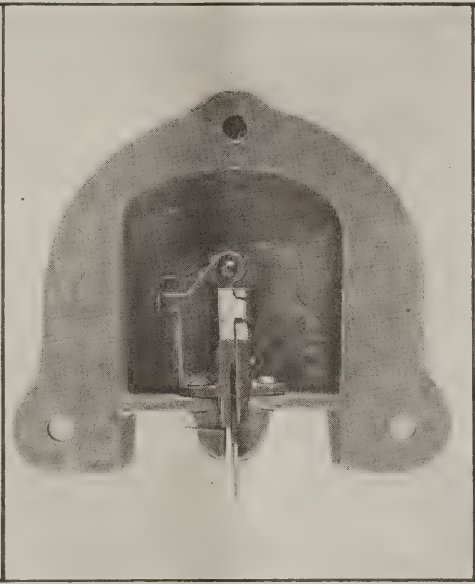


FIG. 2. REAR VIEW

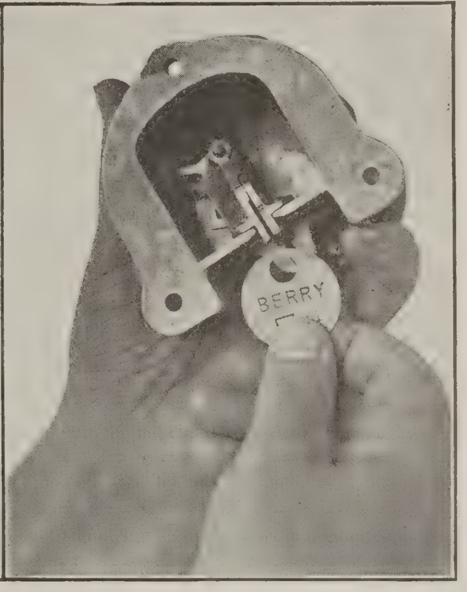


FIG. 3. CHECK REMOVED

To obviate these difficulties, the S. C. Webb Co., of Pittsburgh, Penn., has brought out the "check hook" shown in the accompanying illustrations. This "hook" consists of a gravity-operated padlock inclosed in a suitable cast-iron shield which is bolted or riveted to the left-hand side of the car. A check may be inserted in the slot provided for that purpose and locked securely in position. When the car arrives at the dump and is tilted 25 deg. or more, a slight upward pressure on the check, followed by a downward pull, quickly and easily removes it.

When the car has been returned to the mine and is level, or nearly so, another check may readily be inserted. A check cannot be inserted and locked in place unless the car is level or nearly so, nor can one be removed except when the car is tilted 25 deg. or more as in discharging.

The illustration shows three views of this nonpickable safety check hook and lock. Figs. 1 and 2 are a front and a rear view of the apparatus, with a check locked in place. Fig. 3 shows the lock tilted sufficiently to allow the check to be removed.

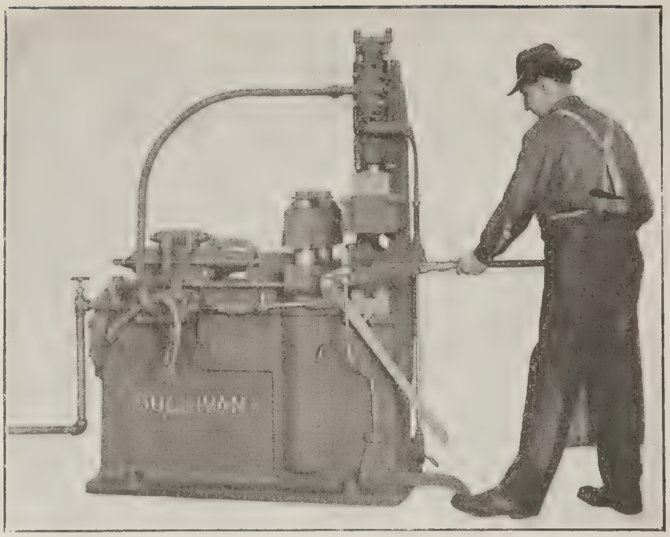
This check lock renders it extremely inconvenient for the would-be "car thief" to substitute his check for that of the rightful "owner." Since it is possible to remove a check only when the car is tilted, as in the dumping position, a loaded car would have to be jacked or pried up to such a position before the removal of a check could be accomplished. This would require too much work and take too long a time to be successfully accomplished. The new hook therefore protects the miner from loss. It also removes a prolific cause for suspicion and unrest among the miners.

⁂

A New Drill Sharpener

A new machine for making and sharpening rock drills, as well as making chain machine bits and other blacksmith work around the mine, has been developed by the Sullivan Machinery Co., of Chicago, Ill. This machine in general follows the lines of the Imperial sharpener built for many years by T. H. Proske, of Denver, but is considerably larger and more heavily built, as well as being more powerful than its prototype.

This sharpener consists of two members, one being horizontal while the other is vertical. Each member is equipped with a Sullivan rock-drill cylinder provided with differential air-thrown valve motion. The horizontal hammer upsets the steel to the general shape of the

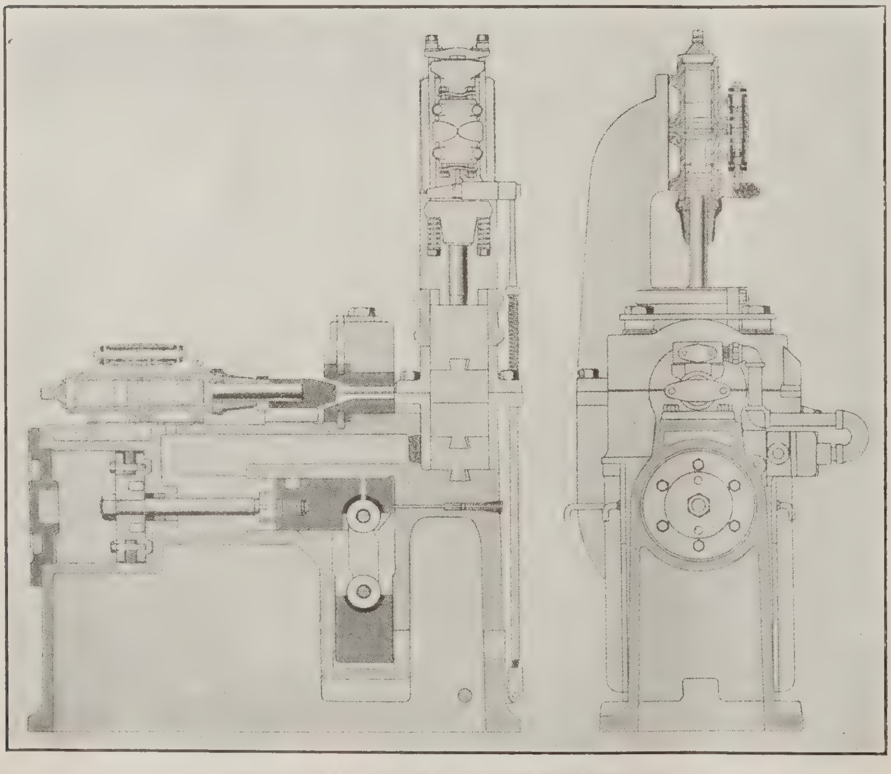


THE DRILL SHARPENER IN USE

bit or shank of the drill, while the vertical member is used for shaping the wings of the bit, etc., and for drawing out and finishing the corners. Steel dies are of course employed, one acting as an anvil and the other as a hammer, the latter being attached to the piston. While the drill steel is being upset it is held in position by a heavy vise operated by air pressure.

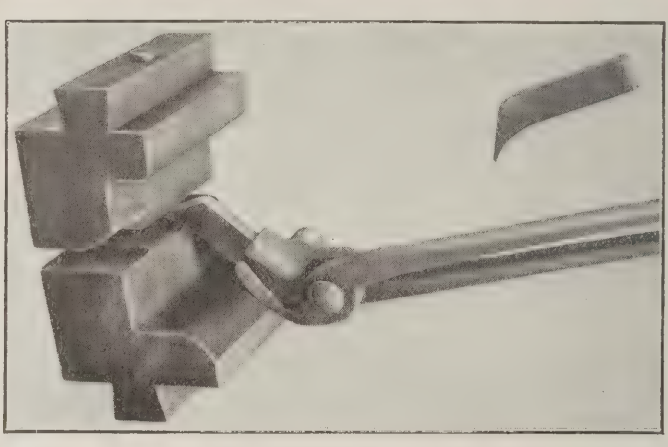
The new sharpener occupies a floor space of 5x2½ ft. and is 6 ft. high, weighing 4000 lb. Provision is made so that the operator cannot start the upsetting hammer until the clamp or vise is in operation. There is also a positive guard against operating the vertical hammer while the horizontal one is being used.

The control levers are so placed that the smith operates the machine with his left hand and left foot, the steel being easily held with the right hand. With a little practice a blacksmith may make a new drill steel in from 50 sec. to 1 min. and machine bits with equal rapidity.



SECTIONAL VIEWS OF THE MACHINE

Bits of any form or size may be made on this machine from steel of any shape, either solid or hollow. It is, however, of course necessary to furnish proper dollies and dies for the different sizes or shapes of bit. Drill steels are now being made on this machine, both cross and six-point rose shaped, for the ordinary hand hammer drills as well as for air-driven stoping drills extensively used in coal mines for light rock excavations, taking down roof, trimming walls or taking up bottoms of gangways or headings where the thickness of the coal measures requires such work. Dollies may also be made for putting the lugs and collars on the shanks of hexagon and round drill steel required by various types of drills used for these purposes.



DIES FOR MAKING CHAIN BITS

In addition to this the Sullivan sharpener will do a variety of special work, such as forging bolt-heads and making coupling pins for mine cars. Furthermore, by the aid of suitable dies and dollies, bits for use in the chain type of electrically driven or air-driven undercutter may be readily forged.

It has long been recognized that so far as the quality of the steel is concerned no improvement can be made upon the method of sharpening drill bits by hand. The constant hammering and working of the steel over the anvil secures a toughness and durability impossible by pressing or forming methods. This is, however, the exact result obtained by the use of this sharpener, since all shaping and forming are done by hammering. In addition to this, uniformity in the gage of the drill bits is secured, while steels may be sharpened or made from new stock at a much more rapid rate than is possible to attain by hand methods.

During the past few years many small portable compressor outfits have been sold for use underground. These drive small hand-held drills which are used during a great percentage of the time on rock removal. By the aid of this new Sullivan sharpener, steel suitable for use in these drills may be manufactured or sharpened with great uniformity and precision, as well as rapid dispatch.

Editorials

Ever a Better Beyond

The trouble with all our agreements in the coal industry is that they are regarded by the miners as only temporary arrangements, as contracts *ad interim*. There is no harm in making them binding for only short periods of time, with the idea that if conditions change there should be a change in scale. So, too, these documents should be recast occasionally to remove unexpected inadequacies or to provide for somewhat general changes in the public attitude to the labor problem.

But the union takes an entirely different view of the matter and has quite another reason for wanting a short-time agreement. It desires to raise the rate of compensation steadily without any regard to the demand for coal, its price or the cost of living. Its purpose is steadily to ask for more. "This," the union says, "is all we demand this time. Next time we will have other demands." This attitude is one which can only be right if the agreements made are always unfair to the miners and promise inadequate compensation for their labor, and if the work of arbitration commissions, if appointed, is always improperly performed.

When the unionized miners want a different contract from that under which they are working they should be able to show a new condition warranting a change in contract. If they cannot show it, their strife should be sternly reprobated by the public. The consumer should exhibit an uncompromising attitude to both operators and miners when they strive without modifying cause to disturb agreements which have been carefully adjudicated and on which a business has been assiduously built.

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Housing Coal Miners

It was with full conviction that *Coal Age* is an open forum that we published the second article entitled "Why Are Strikes at Coal Mines of Such Frequent Occurrence?", for we cannot say it has our indorsement. Our remarks are limited at present, however, to that part of that article that refers to the house problem.

The rent of houses at mining villages was set many years ago, and with the years has not increased. Two decades ago miners and others lived on a lowly scale. The timber was cut from woods within a mile of the village to be built, and the mill which reduced the logs to boards and scantlings was probably even nearer. The houses quite frequently had no cellars and stood on posts. They were not painted and in most cases building paper, in rough red sheets held in place with loose-headed nails, lined the interior.

These houses, which sheltered now lumberjacks, now miners, were regarded as satisfactory dwellings in that primitive time. For no one came into that "neck of woods" unless he had the soul of a pioneer. He rather gloried in inconveniences, as people are wont to do who go hunting and build an insanitary hut and call it a bungalow or a shooting lodge.

All this rustic simplicity was comforting to the lumberman and mine owner. He made 30 to 50 per cent. per annum on the kind of house he furnished, as the lumber could be put down at the site for little over $8 per thousand, perhaps a third what it is now; and there was little loss when the time came to move the town, for there was no masonry or plastering to be spoiled in demolishing the house, and the roof might even be clapboarded, and so redeemable in large part.

In those days there was indeed a large profit in houses. It was a "graft" only inferior to the company store and the railroad rebate. And it would have lasted had not the progress of civilization been promoted by the operator building a fine house at the county seat and by the lawyers and merchants in that same center following suit. Other causes for the change were the competition for miners and the advancing price of lumber.

In some places such houses are still rented. But nearly all the old mining towns have long since passed away and the newer towns, if not for humanitarian, at least for competitive reasons, have been better built. The walls of these dwellings are now plastered and wainscoted; the roofs are shingled, frequently with red cedar shingles, sometimes with slate, though tar paper is still not unknown. The walls after they become dirty are papered if the houses are occupied by English-speaking families. At the same time the price of lumber has risen and the labor required in erection has become more costly.

Only the rent is unchanged. That remains $2 per room per month in Eastern mine villages. It is now a fair compensation for the houses supplied. These are four-roomed dwellings and can be erected in large quantities for about $600. The water supply and fire protection, important items, are extra expenses. Such houses bring 16 per cent. per annum, when all losses and expenditures are not considered. This seems not a fair but a large compensation; but a little inquiry will show that it is by no means excessive.

The greater proportion of company mining villages do not last over 15 years, especially in western Pennsylvania, where the tonnage of a mine is large. It is true that some can be recalled which have been the seat of a post office for a much longer period, but the greater part of the time the mine has been running at much reduced capacity or is a poor producer at all times. Only a small proportion of the whole territory near large mines is working after 15 years, and as a result the houses are largely boarded up or pulled down and removed. A house which is plastered and has a cemented cellar is by no means removed with profit. It pays almost as well to erect a house from entirely new material.

So it is safe to reckon the obsolescence charge on a house as 6⅔ per cent. Deducting this from the profit of 16 per cent., only 9⅓ per cent. remains, and from this must be deducted loss of rent from empty houses, repairs, betterments, taxes, insurance, fence-building and whitewashing, collection, bad debts, uncovered fire losses, village improvements, garbage collection, supervision, the replacing of overcharged cesspools, general sanitation, etc.

In cases where betterment plans are somewhat generally forgotten, the first five items are the chief ones. Even where the company is somewhat negligent repairs are frequently not to be overlooked. A Polander has been known in drunken moments to light a fire on the floor. The protecting boards between the posts supporting the house have been torn away for a cowshed and legends have been painted on the house front. Doors are broken and split, locks wrenched loose, windows broken and steps and stairways are hatchet worn. This cuts the profit down close to 6 per cent., or even lower.

But 5 per cent. is a bonanza for many bituminous coal operators. If only they could do as well at mining coal they would be wondrous glad. We should not be surprised when we hear them say that the houses and the store saved the day. We should not necessarily infer either that the day *had been* saved, as ordinary business would view it, or that in saving it the houses and store had yielded an unfair profit.

And it must be remembered that your operator is often blind and overlooks the needful amortization of nearly 7 per cent. In fact he is blind enough sometimes to brag a little when he is really losing money because he forgets the time when the whole property value will be wiped out and shuts his eyes to the possibility of rows of idle houses in the future.

The house problem is not settled by any means. It is not clear that a fair rent solves the problem. The National Housing Commission advocates a better house. Americans should live in houses with stationary washtubs, bathrooms and other conveniences, and there should be an adequate porch front and back. There should be good water in every house. But in that day rents in mining towns will be almost as high as in villages with private ownership.

The United States Coal & Coke Co. is giving a good 6-room house, with bathroom and a good cellar with coal bins, to some of its employees for $12 a month. These houses have a hot-air furnace and are wired for electric lights. Such houses, which in boroughs would rent for $25 a month, cannot pay a fair rate of interest, any more than those at Concrete City which were erected by the Delaware, Lackawanna & Western R.R. Coal Department. The subsidiaries of the United States Steel Corporation are getting a fair price for their coal from the parent company and can afford to run their houses with a low return.

By prudence they may be able to increase the life of their towns and thus save amortization charges. The values of anthracite towns are less affected by the passage of time, as the coal is thick and beds numerous. But the houses of the companies mentioned are rented far below what would be charged for the same dwellings in an open town.

The miner who moves to a borough with private ownership usually has to pay a price a half larger or twice as large for a slightly better house. He really pays more for what he gets, for the landlord has greater costs of collection, larger taxes, more risk of bad debts and no cause to offer inducements to the tenant. He has no coal he wants to see dug. He is only looking for rent, not for workingmen.

The remark of Mr. Archbald that men are compelled to rent houses really does grieve the fairminded man, for an operator is surely justified in hiring men who will rent from him when he has a string of idle houses which have often been built solely in order that his men might be accommodated. Would any reasonable man ask him to sustain a dead loss on his property year by year because the men prefer a cheap shack on the outskirts of his village to a reasonable house on the property built only for the benefit of employees and offering for rent at a fair price? One thing which makes rent so cheap in mining villages is the fact that a little discrimination in hiring keeps them full.

Rents are too low in mining towns and the houses not as fine as they should be. But until the miner is ready to pay more or legislation makes the operator face the problem rents and houses will both be much like they have been. The rents having become adjusted to the houses and the miner being opposed to a large rent, it is probable that the next decade will show less progress than the past.

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The War on Shipping

It appears that up to June 30 511 merchant ships had been lost as a direct result of the war and that this amounted to a shrinkage of nearly 1,000,000 gross tons, or 2 per cent. of the world's available merchant tonnage. Of this Great Britain lost 609,934 and Germany 102,062, or nearly 3 per cent. of their combined tonnage at the beginning of the war. The remainder of the loss was shared by the United States and 12 other nations. So great an inroad on the carrying trade—a loss sure to increase as the months pass—has a serious bearing on freighting all over the world.

Particularly is this true when one recalls that the shipyards of Great Britain and Germany, together with those of France and Austria, launched in 1913 no less than 2,635,231 gross tons in merchant vessels and that these plants, as well as those of most neutral nations, are now confining their efforts exclusively to war and naval construction.

The United States is of course a notable exception, but the ocean carriers now being built in American yards, while promising well for their owners, are likely to relieve but little the demand there will be at the end of the war. Besides the seven or eight lake steamers now being fitted for the coastwise trade, there are only seven steam colliers in process of construction on the Atlantic seaboard, and two of these are for Baltimore shippers who plan to inaugurate a regular coal service to the Mediterranean.

When the new coastwise boats are added to those now available, there will be only about 30 steamers engaged in freighting coal between Atlantic ports. While these will undoubtedly be sufficient for coastwise needs they will be able only occasionally to supplement the sailing vessels now so numerously engaged in trade to South America.

It is therefore evident that what tonnage is being projected is as a mere drop in the bucket when compared with the tremendous losses sustained on the other side of the Atlantic. Merchant shipping is in for a long period of high rates, and this indeed may soon be one of the world's grave questions.

Sociological Department

Resuscitation*

By W. S. Rountree†

SYNOPSIS—Electric shock attacks the lungs or the heart or both. If the heart is dead or quivering it cannot deliver blood and therefore oxygen, and so artificial respiration is vain. But if the heart is working and the blood is unaffected, assisted breathing will in all cases restore the victim to normal condition.

The prime need for those who have been suffocated by mine gases or shocked by the electric current is to bring an immediate supply of oxygenated blood to the vital center of the body, for its deprivation of oxygen for 10 minutes may injure beyond repair some of the important brain cells, in which case recovery is unlikely.

When spontaneous breathing has stopped from any cause artificial respiration is the most valuable means for bringing back a normal condition of the body. But all methods are not equally useful for this purpose, even though they may cause an equal ventilation of the lungs.

Circulation of Worthless Blood

Thus in simple asphyxiation, such as may be produced by electric shock, the nervous control of the muscles of respiration is temporarily paralyzed, while the heart continues to pump blood through the body. But this blood is not oxygenated by respiratory action, and the heart soon ceases to beat effectively and the victim dies from asphyxia. In such a case there is no poisoning of the blood, and ordinary air is all that the lungs need and artificial respiration, when applied, will supply it.

But if the victim is overcome by carbon monoxide, which is the principal poison found in the gases after an explosion and is the dangerous constituent of illuminating gas, oxygen should be used. Carbon monoxide, happily, does not form a permanent combination with hemoglobin any more than oxygen, but it unites with it or separates from it according to the partial pressure of oxygen and carbon monoxide in the air breathed.

The blood of a victim that has been exposed to carbon monoxide gradually becomes so saturated with the gas that it cannot readily absorb and therefore convey oxygen, and so the victim dies of asphyxia, not because the carbon monoxide is poisonous, nor because of lack of oxygen, but because the blood loaded with the monoxide is little disposed to be the vehicle by which oxygen is carried to the tissues.

If the victim is unconscious, but breathing in a normal manner, he may be allowed to inspire oxygen himself; otherwise artificial respiration should be performed and at the same time oxygen should be administered.

Electric shock may paralyze the nerves by which the muscles of the respiratory organs are controlled or it may do the same for the heart. When the heart is affected, it ceases to contract as a whole, but contracts in parts and apparently quivers, or "fibrillates." The action is so weak and ineffectual that it fails to keep the blood circulating, and death is the result. After such quivering has commenced no process yet discovered will restore the heart to normal action.

Alternating currents of high frequency applied to the heart increase the number of beats so that fibrillation, or quivering, does not occur. Oscillating currents of high potential materially aid in restoring the heart beat of dogs in conjunction with the perfusion of the coronary vessels with defibrinated blood. The evidence clearly shows that the higher the frequency of the current the greater the volume which can be delivered to the tissues without fatal results.

I have known a case in which a current of 6600 volts has passed through a man's body without killing him. On the other hand I have seen an alternating current of 110 volts cause instant death. While 200 volts is not ordinarily dangerous, any current of high voltage must be carefully dealt with if one would escape electrocution.

Crile and others have demonstrated that fibrillary contraction of the heart and respiratory paralysis are the chief causes of death from electric shock. Since the first cannot be cured, the hope of resuscitation lies wholly in proper treatment for paralyzed respiration. If the lungs are deprived of oxygen for 10 minutes, death ensues; so methods of resuscitation should be used immediately and continued till normal breathing recurs.

Schaffer Method Is the Best

The Schaffer method of artificial respiration is to be recommended as it is better than the Sylvester in that it is simpler and more easy to perform and provides greater ventilation of the lungs. It is also less likely to injure the ribs and liver. Moreover the tongue does not fall and block the air passages.

In treating electric shock the first-aid man must keep cool and follow instructions even if the victim appears dead. The electric circuit must either be broken or prevented from passing through the patient. This can be done by using a dry coat, a dry board or rubber gloves. The electric wire may be cut by an ax or properly insulated pliers or any other nonconductor. No metal or moist material should be used in endeavoring to rescue the victim. If his clothes are loose and dry, they may be used in pulling him off the wire, but in doing so use one hand and be careful not to touch the soles or the heels of his shoes as the nails in them are dangerous.

As soon as the victim is moved from the live conductor, a finger should be passed into his mouth and throat to remove all foreign bodies such as false teeth, tobacco or gum. The rescuer should not even stop to loosen the clothing, nor to remove the victim from the scene of accident, for every moment of delay is serious. Artificial respiration should be continued for two hours, or longer if necessary, and in most cases it will bring the victim back to a normal condition. But if the current has exerted its power mainly upon the heart and that organ has ceased to beat, artificial respiration, while it will do no harm, can do no good, as the victim is absolutely dead.

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*Abstract of paper read before the Alabama Safety Association, May 1, 1915.

†Chief surgeon, Tennessee Coal, Iron & R.R. Co., Wylam Hospital, Wylam, Ala.

Several medical devices for causing artificial respiration have been marketed in recent years such as the Pulmotor, Lungmotor and the apparatus which Dr. Meltzer has devised, but as yet the cases treated with the devices do not furnish absolute proof of the value claimed for them.

The primary and essential object of resuscitatory methods is to supply the brain with a circulation of oxygenated blood. Cerebral anemia must be overcome within less than seven minutes or the patient will pass into a sleep which knows no awakening.

Keystone Coal & Coke Company Contest

The first-aid teams of the Keystone Coal & Coke Co., of Westmoreland County, will hold their fourth annual demonstration at Athletic Park on Sept. 4, the first Saturday in that month. General Superintendent H. F. Bovard and Chief Inspector William Nesbitt will be in charge of the meet and have announced that about 60 teams are expected to attend.

The big prize of the contest is the cup offered by the late Col. L. B. Huff. The cup must be won three years in succession. Crow's Nest won the prize at one of the meets, and Arona won the last year's contest with an average of 100 per cent. and has therefore established a claim on the cup. Several hundred dollars in cash will also be included in the list of prizes.

One Operator's Experience with the Liquor Problem

The following letter, from the Pittsburgh *Gazette*, has been sent by a subscriber, who requests that it be published:

> At our works we have a mixture of races, as I have never believed in employing too many of any one nationality, although in the case I am about to relate, the mixture soured somewhat. About six months ago, shortly after the European war started, a number of our men one evening congregated at one of the houses for a little drinking bout, during which the trouble across the water was of course discussed, with the result that might have been expected—a free-for-all fight in which one man was shot and seriously wounded. The shooter, a fine workman, got away and is still away, and our entire force was disorganized for several days.
>
> ### SUPERINTENDENT MADE A PERSONAL PLEA
>
> This set me to thinking. I realized that the same thing was liable to happen every time any number of our employees got together where there was booze, and I finally decided to try the "water-wagon" plan. I had a list of those who regularly ordered beer and whiskey and I went personally to each man. I called attention to the shooting scrape and the resultant trouble and told them I had decided to ask them not to order any more intoxicants during the progress of the war; that while I had no intention of interfering with their personal privileges, this was a matter that concerned the good of the entire community and I felt justified in making the request. A large majority of the men received the proposition favorably. A few, however, rejected it on the ground that their rights were being interfered with. These men are not now working for us; they are exercising their rights and doing their drinking at some other works.
>
> The result of the new order of things was a surprise to me. I had expected an improvement in conditions, but nothing to what happened. Right from the start we had no shortage in our labor supply; everybody was on the job; the men worked regularly; the usual "sick" list after lay-off days and Sundays was entirely wiped out; the coal came without a hitch, the ovens were charged in good time and everything moved along swimmingly.
>
> ### MINERS WANTED MORE WORK
>
> A little later several of the miners came to me and complained that they were not getting enough wagons to load. I investigated and found they were doing somewhat better than before the "reformation" started, and told them so.
>
> "Me know," said a big Hungarian, "but want more wagon," and throwing out his chest and spreading his arms continued, "Me feel better no booze, want work all time now; can load one, two, mebbe three more wagon; loaf too much in pit now."
>
> I promised to see what could be done and immediately went over the roll. I found a number of undesirables and weeded them out, and today we are operating our plant with 25 per cent. less men than when the war began, are getting done in better time, the men are in better condition physically and mentally and everything in general has improved wonderfully.
>
> I believe, too, that the "reformation" is going to stay with us. Several of our hardest drinkers have told me that they are through with booze for all time. This sentiment is spreading among our people and we are encouraging it in every way.
>
> ### TEMPERANCE HAS ELIMINATED ACCIDENTS
>
> But the most gratifying result lies in the practical elimination of accidents in our mine. Heretofore it was almost a daily occurrence to have somebody injured. Most of the accidents were not serious, but they showed thoughtlessness and carelessness. They were disquieting and a continual jolt to the operation of the plant. Now, however, the men are going about their work intelligently. During the last six months we have not had a man hurt either inside the mine or out, and I want to tell you that a condition of that kind makes the man in charge feel mighty good.
>
> Of course should there be a general resumption in the region there would be a shortage of labor. This has always been the case after an extended shut-down, and just now the war aggravates the situation, as the workers who are abroad cannot return. However, if the operators generally were to adopt my plan, I am satisfied that the effects of this labor shortage would be much less serious than appears on the face.

Somerset County First-Aid Meet will be held Sept. 4

The Somerset County Miners' First-Aid Meet, which has heretofore been held at Somerset, Penn., will assemble this year at Boswell, Penn., on Sept. 4. This will give a much larger number of miners an opportunity to attend the meet. Already preparations are being made to make this a holiday and a gala day. The Public Welfare Association has agreed to coöperate to this end.

Fifteen teams have promised to compete—the Consolidation Coal Co. teams at Meyersdale, Pine Hill, Shaft No. 123, Jenners and Acosta, the Merchants Coal Co. teams at Boswell, the Jenner-Quemahoning Coal Co. team at Jerome, the Quemahoning Coal Co. team of Ralphton, the Victor Coal Co. team at Holsopple, the Brothers-Valley Coal Co. team at Macdonaldton and the Knickerbocker-Smokeless Coal Co. team at Hooversville.

There will be events for one, two and three men and a full-team contest. Rules and discounts will be similar to those of last year. Contests for ladies' teams and for teams of boys from mining towns have been requested. Prizes will be offered as heretofore, and the American Mine Safety Association and the American National Red Cross are coöperating and will give their medals and certificates to the winners. An expert from the United States Bureau of Mines will aid in training the men before the meet takes place.

This meet, as those in the past, will be held under the auspices of the mining department of the state Young Men's Christian Association of Pennsylvania. The members of the local committee in charge of the Somerset first-aid meet are: F. W. Cunningham, state mine inspector, Somerset, Penn.; Samuel Steinbach, Somerset; Richard Maize, Jerome; John Gibson, Jr., Boswell; Ralph Zimmerman, Ralphton. It is not too late for other teams to enter. As there are 49 separate mining operations in Somerset County, many more entries should be received.

Discussion by Readers

The Pennsylvania Amendment

The mine foremen, assistant foremen and firebosses in Pennsylvania, who have qualified for the positions they hold by passing the examination, and who hold the certificate of competency granted them by the state examining board, have been much exercised of late by the passage of an amendment to the mining law providing for the employment of uncertified men in these positions.

A careful survey of the situation, however, warrants the conclusion that such fears are largely groundless. The general opinion seems to be that persons who desire to act as mine foremen and firebosses will continue to take the examination and receive certificates from the Department of Mines, as before, although the operators will have the right to select persons to act as mine foremen, assistant mine foremen and firebosses from the uncertified workers, while, at the same time, they assume responsibility for all official acts.

It may be stated with assurance, however, that there will not be many uncertified men employed in such official capacities, as coal operators will largely prefer to engage men who hold a state certificate of competency. There will, of course, be a few exceptions where an old employee has proven very valuable in the service of the company by reason of his long experience, efficiency and good character, and the company, being fully satisfied with his previous record and willing to assume all responsibility for his future acts, desires to retain him in its service in an official capacity, notwithstanding the fact that he has not passed the examination, owing to a lack of technical knowledge, and does not, therefore, hold a certificate of competency under the state law. It is recognized that the failure to hold such a certificate is, in a number of instances, due to the lack of early education, or a want of familiarity with the English language sufficient to enable a candidate to make a creditable showing in examinations.

J. T. Beard.

New York City.

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Value of Coal Analyses

Letter No. 4—I have just read Bykem's letter, *Coal Age*, July 10, p. 60, and am pleased to note that he comes a little nearer to my idea than did Mr. Coupland in a previous letter.

Bykem argues, however: "To impose this duty of testing coal on the mine operator, as suggested by Mr. Near, is hardly just unless his commodity can be sold at an increased price."

Very well; let the mine operator charge a little more for his coal, if necessary. He would then be doing no more than what the coal-sales agency is doing now. Any sales agency must certainly have to charge a little more on account of the analysis. My suggestion is to make only one analysis, and that a reliable one. I believe this should be made by the party mining the coal.

Or a certain mine could sell all of its coal to one sales agency and trust that agency to make the necessary analyses. If the analyses are correct and the coal is sold on a heat-unit basis, the desired end will be accomplished, the cost to the consumer will be less, and he will be reasonably sure of getting the kind of coal suited to his purpose.

N. G. Near.

New York City.

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Sampling Coke

Letter No. 1—Referring to the inquiry in regard to sampling coke, *Coal Age*, July 3, p. 28, permit me to draw attention to a point that is of utmost importance in the sampling of coke for blast-furnace use. I refer to the ash determination, since every pound of ash in a ton of coke means more expensive fluxing, increased cost of smelting, useless cinder and less furnace capacity available for the production of metal. For this reason differences of opinion as to the ash content of coke for blast furnace use often cause bitter controversies.

In an investigation of this subject several years ago, I was surprised to find how much of the apparent ash content of coke was due to foreign material introduced in the process of grinding the sample. For instance, the analysis of a sample reported as containing 17 per cent. of ash showed that $^1/_{17}$ of this ash, or 1 per cent. of the weight of the sample, was iron abraded from a Braun pulverizer. It may be stated that the ordinary cast-iron bucking-board and muller much used in grinding samples to be tested introduces iron into the sample to the extent of from ½ to 3 per cent.

Whether the grinding be done by machinery or by hand, this introduction of foreign matter in grinding can be cut down greatly by the use of manganese- or chrome-steel grinding plates.

As the seller of coke is vitally interested in the ash content of his product, it will pay him to look up this matter and see that his own sampling machinery as well as that of his customer is of the best possible quality. In case the customer is grinding samples on an ordinary cast-iron plate that perhaps is so old that the surface chill has worn through, it may pay the seller to make his customer a present of a new bucking-board.

It is impossible to determine the amount of this contamination with a magnet, for the reason that too much coke dust will adhere to the iron filings. It is necessary to treat the sample with a neutral copper-sulphate solution, agitate thoroughly, filter and wash the residue with hot water until entirely free from soluble copper salts. This residue is now dried and ignited and the ash tested for copper or treated directly with nitric acid to dissolve the copper. The weight of copper precipitated by the iron in this process is then calculated from the ratio of their respective atomic weights.

This method will not answer for the determination of any foreign material introduced by ball or pebble mills, but is very effectual where the grinding surfaces are of iron. It may be objected that the original ash of the coke may have contained some iron which has been reduced to the metallic state by the red-hot carbon of the coke during the coking process. In answer to this argument, however, it may be stated that any iron in the coke is present as ferrous oxide and combined with silica to form ferrous silicate ($FeSiO_3$). But in any event the objection is scarcely valid, because if the coke sample is crushed in a silica-pebble mill or in an agate mortar, the iron in the coke does not react with neutral copper-sulphate solution, according to my results.

Donald M. Liddell.

Elizabeth, N. J

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The Mine-Lamp Question

Letter No. 1—I want to offer a few comments urging the need of better illumination in mine workings, particularly at the working face. Much can be said to discredit the common open-light oil lamp used by a majority of miners. In my opinion this lamp should be consigned to the rubbish heap, where it rightfully belongs. It is unsanitary and often dangerous. Its light is uncertain, and although giving a better illumination than that afforded by the dim light of the safety lamp, it cannot be compared in this respect with the light of the electric mine lamp, which is being largely introduced in uptodate mines at the present time.

Not long ago the experiment was made of comparing the wages or earning power of the miners working in two districts under similar conditions, except that the mines in one case were lighted with portable electric lamps used by the miners, while the men in the other district worked with other lamps, using either the common open light or the safety lamp. The results of this experiment were decidedly in favor of the electric light.

The brighter light afforded by the electric lamp not only increases the earning power of the miner, but overcomes the objection often urged that the dim light under which miners are forced to work is a large factor in developing the disease known as "miner's nystagmus." I remember that a very interesting discussion was conducted in *Coal Age* some time since (Vol. 4), when facts were stated by some showing that the continued use of the Davy safety lamp by firebosses tended to develop and increase this disease, although the opinion was advanced by men who had used the lamp continuously for many years that such continuous use had no effect on healthful eyesight.

In my experience it has been found that the introduction of lamps having a greater illuminating power has been followed by a decided reduction in the number of nystagmus cases among men working in the mines. Men in my charge who were affected with this disease or even suspected of developing nystagmus were invariably furnished with an electric lamp. The testimony of these men is unanimous to the effect that they can do better work with greater comfort than with the old light and that on going home they can read the newspaper without its producing headache or affecting the eyes as formerly.

I also believe that where men are furnished with a clean and better light the number of accidents is greatly reduced and the general health of the men improved. It is freely admitted that the first cost of electric mine lamps is comparatively high. Also, where the mine is not equipped with an electrical system, it is necessary to install a generator or purchase electric current to recharge the lamps. To offset this, however, it may be stated that with proper use and care the lamps do not get out of order.

An important feature that commends the use of the electric lamp is that it does not consume the oxygen, which is the vital element of the atmosphere, and does not smoke or generate gas to vitiate the mine air. Such lamps as have passed the test of the United States Bureau of Mines and are classed as "permissible" can be regarded as safe for work in gaseous or dusty atmospheres. It can also be stated that the electric current necessary to operate these lamps costs less than oil, giving at the same time an excellent light. Wherever they have been installed and given a fair trial, they are held in high esteem for general mine use. It must be admitted that the chief disadvantage of the electric mine lamp is in its inability to reveal the presence of gas in the mine air. I would suggest, however, that this loss can be overcome by competent firebosses making regular examinations of all places in a mine generating gas.

On the other hand, oil lamps, though cheap in respect to first cost, consume much of the oxygen of the air and often smoke owing to the fact that they can be made to burn almost any kind of oil or grease found about the mine. Where such lamps are in use, the air frequently becomes foul with the smoke and gases produced by the lamp. Much fine carbon is deposited on the timbers and the walls of the mine. The open flame of the lamp is dangerous wherever gas is generated or the mine particularly dusty. Numerous fires in mines have been traced to the use of the open light, the flame of the lamp coming in contact with canvas, hay, oil-soaked timbers or dry brattice boards. A discarded smoldering lamp wick thrown into a corner may start a fire in oily waste or other combustible material.

In conclusion, I want to say that when one considers the large number of accidents that have resulted in the loss of precious lives and which have been caused directly by the careless use of an open light, it is clear that we are playing a game of chance in the mines every day that we continue to use such lamps. In the interest of the Safety-First idea, which is being preached and practiced so extensively today, I would urge that it is high time that we recognized this great menace to life and property in the operation of coal mines and deal with it as it deserves.

J. W. Powell.

Windham, Mont.

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Rotary Converter vs. Motor-Generator Set

Letter No. 2—The article on this subject, by T. R. Hay, that appeared in *Coal Age*, May 22, p. 880, has just come to my attention. There are several statements made in this article in reference to design, operating characteristics and the application of the various types of machines that are quite misleading.

The fact that the author limits his discussion to this type of apparatus as applied to coal-mining work would suggest that the size of the units considered, whether rotaries or motor-generator sets, does not exceed a maximum of 400 kw., while the average size of the unit employed would probably be about 150 kw. This limitation of size of unit makes some of the author's statements not applicable to the conditions he is considering. For instance, booster rotaries are never built in such small sizes, but are used exclusively for central-station work and have a minimum size of about 1000 kw.

What the author says in regard to the application and limitation of the different types of transforming apparatus is also misleading, as it is prejudiced against the rotary converter. A rotary converter or a motor-generator set, of either the synchronous or induction-motor type, has a definite field of application where the best results are obtained. Under conditions that permit the suitable regulation of power supply, and where the arrangement is such that an increase in the direct-current voltage at terminals of machine, due to increase of load, is unnecessary the rotary converter is the best type of machine to employ; but such an application should not be made offhand without thoroughly understanding all the limiting conditions.

The synchronous motor-generator set is advisable when the power conditions on the supply circuit are good, and where independent regulation for overcompounding of direct-current voltage is necessary; but if the power-supply conditions are bad the induction motor-generator set will give better results. It must be remembered that while the synchronous motor-generator set has the desirable feature of permitting power-factor adjustment, such an adjustment may prove of advantage or otherwise, depending on the conditions. It is seldom of much use at a central station, without suitable control in respect to the use of power by the consumer. The rotary converter has this same feature of power-factor correction, but in a more desirable degree. In this converter the necessary adjustment can be made permanent so that the power-factor correction will vary with the load, thus always giving the best results with varying load.

In regard to the overload capacity of different types of machines, the modern rotary converter, which is equipped with commutating poles, is capable of carrying momentary loads as high as 300 per cent., while the modern direct-current generator is limited to an overload capacity of only 200 per cent. This advantage of the rotary converter is inherent in that type of machine. In mining practice, especially where locomotives are employed, such momentary overloads are frequent, and substation equipment in coal mining is generally selected with this fact in mind, the limit being the commutation of direct-current machines.

Rotary converters are now designed for 60-cycle service, and give much more satisfactory operation than the 25-cycle machine of a decade ago. The starting of a rotary converter is no more complicated than that of a synchronous motor-generator set, the apparatus being practically the same in each case. Synchronizing is now no longer necessary, which eliminates that objection.

In respect to the total cost it may be stated that, with a few minor exceptions, a rotary converter and its transformers will be cheaper than a motor-generator set of either type. It is worthy of note that the cost for power-factor correction is generally of minor importance to the coal operator, while the cost of installation is his first consideration. It is well to remember that, in addition to the cost of the apparatus, there is the expense of building the substation underground and installing the machinery therein. In this connection, there is a particular advantage in the smaller size of a rotary converter and its switching apparatus, which require less room and a smaller outlay for building the substation.

Where a large direct-current installation is necessary it will be found more economical to have two or more properly located substations with minimum of feeder copper instead of using one substation, requiring an excessive amount of feeder copper and causing large variations in direct-current voltage. With a proper distribution of feeder wires the direct-current voltage will be maintained at a higher average, giving an increased output by the locomotives and costing less for maintenance of auxiliary machinery. In considering a number of substations, the total cost of building, operation and attendance must be taken into account. Substations can often be so located as to combine the attendance of the substation with that of a fan or pump, and thus reduce the expense.

I do not wish to be understood as advocating the general application of rotary converters for coal-mine substations under all conditions. When the conditions are favorable, however, the first cost of the entire equipment and installation will generally be lower, its maintenance no higher, and the overall efficiency much greater than that of motor-generator sets. It may be stated that a more thorough analysis of the engineering features of an installation of rotary converters is necessary than when using synchronous or induction motor-generator sets.

As an illustration, I may cite a company that controls a group of mines in West Virginia and has recently ordered 24 rotary converters, which are to replace former direct-current generating stations, several substations being frequently replaced by a single generating station. In this case, a thorough study was made of all the operating conditions, and the substations were located sometimes on the surface and sometimes underground, with the view to maintaining as nearly constant voltage on the network of trolley lines as possible. To increase the safety of operation the voltage in use was reduced from 500 to 250 volts. But even with this lower pressure the regulation will be better than with the former high-voltage system employed.

W. M. Hoen.

East Pittsburgh, Penn.

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Preventing Mine Explosions

Letter No. 3—My attention was attracted by the statement of Mine Inspector Rose, *Coal Age,* May 8, page 819, where he asserts, "As long as coal is mined disasters must occur."

It is true that mining accidents and disasters have been regarded in the past as incidental to coal production. Most of the opinions expressed as to the occurrence of mine explosions indicate that in the large majority of cases they are the result of carelessness or inefficiency in the management and operation of the mine. This fact alone should be sufficient evidence that it is possible to remedy this great evil. To my mind the statement of Mr. Rose is dangerous and invites the recurrence of mine disasters, which he predicts are inevitable. It shows, however, that mining men are for the most part indifferent if not wholly apathetic in respect to many live and vital questions in mining, upon the solution of which depend thousands of lives each year.

I am not appealing to sentiment solely, but want to urge that the study of this question is a business proposition and should be recognized as such by all engaged in the mining of coal. Human lives are too sacred to be sacrificed on the altar of carelessness, ignorance and inefficiency. It may take a number of years to discover an effectual remedy that will wholly avert the occurrence of mine explosions, but this should not prevent the careful consideration and adoption of any palliative measures that will tend to reduce the frequency of mine explosions.

In my opinion, the true solution of this question lies in a higher sense of duty among mining officials and a more thorough and intimate knowledge of the elementary principles of mining by the rank and file of mine operatives. Attention has well been drawn to the great need of the education of mining men and of coöperation on the part of every mine worker and mine official. Instead of asserting that "as long as coal is mined disasters will occur," we might rather say that as long as mines are operated in a careless and inefficient manner disasters are liable to happen at any time.

Permit me to refer to one instance that will show what can be accomplished where care is exercised in the operation of the mine. Some may regard it as a result of luck or because of particularly favorable conditions in the mine workings, but I consider it is owing entirely to the great care and precaution that have been exercised in this operation. The mine to which I refer employs 800 men underground, and during the past two years there has not occurred a single fatal accident at the working face. Only a complete system of organization can effect such results. Such a record shows that the mine management has made a determined, intelligent and successful effort to render the mine as safe and the operations as efficient as is humanly possible.

In closing, I want to suggest a few points, the observance of which will greatly reduce if not entirely eliminate mine accidents. They are as follows:

1. Employ none but thoroughly trained and competent mine officials to take charge of operations underground.
2. Let all mine officials meet regularly, say once a month, to compare notes, exchange opinions and discuss plans for greater coöperation in their work.
3. Provide for a closer, more frequent and thorough inspection of all mining work.
4. Provide ample opportunities for the education and training of miners, by which they may become thoroughly familiar with the principles involved in their work. I believe that what man has done, man can do, and as accidents have been reduced to a minimum by the exercise of greater care and precaution in one mine, it is possible to do the same in other mines.

William Crooks.

Ensley, Ala.

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Study Course in Coal Mining

By J. T. Beard

The Coal Age Pocket Book

VOLUME OF AIR AND GASES

The volume of any given weight of air or gas depends on two factors—the temperature of the gas and the pressure it supports.

Effect of Temperature—For any given weight of air or gas, its volume varies directly as its absolute temperature, assuming the pressure remains constant.

Effect of Pressure—For any given weight of air or gas, its volume varies inversely as the pressure it supports, assuming the temperature remains constant.

Expansion and Contraction of Air or Gases—Any change in temperature or pressure causes a corresponding change in the volume of the air or gas, as follows:

Increase of temperature causes expansion.
Decrease of temperature causes contraction.
Increase of pressure causes contraction.
Decrease of pressure causes expansion.

Coefficient of Expansion or Contraction—The cofficient of expansion is the same as that of contraction. This coefficient is practically the same for all gases and air and is independent of the pressure.

The coefficient of expansion of air or gas is the ratio of the increase in volume to the original volume, for an increase of one degree in temperature. Since a degree of the Fahrenheit scale is 5/9 of a degree of the centigrade scale, it is evident that the Fahrenheit coefficient of expansion will be exactly 5/9 of the centigrade coefficient. These coefficients are as follows: Centigrade, 0.003663: Fahrenheit, 0.002035.

Illustration—Let it be required to find the increase in volume in an air current of 100,000 cu.ft. entering a mine at a temperature of 32 deg. F. and discharged at a temperature of 68 deg. F.

Solution—The rise in temperature is 68 — 32 = 36 deg. F. The increase in volume, calculated by the Fahrenheit scale, is

$$100{,}000 \times 0.002035 \times 36 = 7326 \text{ cu.ft.}$$

Or, since 68 and 32 deg. F. correspond to 20 and 0 deg. C., the rise in temperature is 20 — 0 = 20 deg. C., and the increase in volume, calculated by the centigrade scale, is

$$100{,}000 \times 0.003663 \times 20 = 7326 \text{ cu.ft.}$$

Note—Instead of multiplying by these coefficients, it is possible to divide by their reciprocals, which are

$$\text{Fahrenheit,} \quad \frac{1}{0.002035} = 491.4, \text{ say } 492$$

$$\text{Centigrade,} \quad \frac{1}{0.003663} = 273$$

These numbers, being divisors, show that air or gas expands or contracts 1/273 of its volume, for each degree rise or fall in temperature (centigrade); or 1/492 of the same volume for each degree rise or fall in temperature (Fahrenheit). The figures point to what has been called the "absolute zero" of temperature scales as being 273 deg. below freezing (centigrade) or 492 deg. below freezing (Fahrenheit).

The Coal Age Pocket Book

Absolute Zero—The so-called "absolute zero" of temperature scales is based on the observed rate of expansion and contraction of all gases and air. This rate is practically 1/273 of the volume, per degree centigrade; or 1/492 of the volume, per degree Fahrenheit. It is clear that if this rate continued unchanged a fall in temperature of 273 deg. C., or 492 deg. F., below the freezing point of water, would reduce the volume of the gas to zero, when all molecular vibrations would cease, indicating a total absence of heat and pressure.

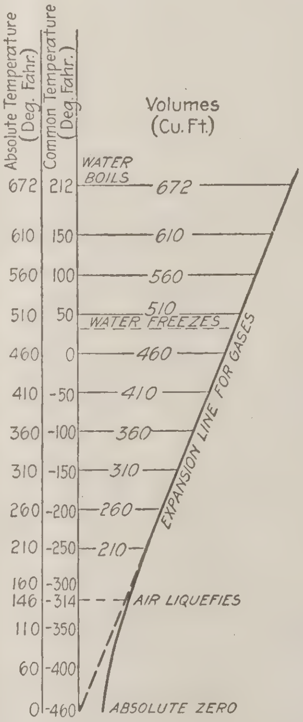
The absolute zero has therefore been fixed at 273 deg. below the common zero of the centigrade scale (—273° C.), which corresponds to 460 deg. below zero on the Fahrenheit scale. The fixing of this point is purely arbitrary, its chief value being the facility it affords in the calculation of gaseous volumes with respect to temperature.

Absolute Temperature—Absolute temperatures differ from common temperatures only in being estimated from the absolute zero. Hence the absolute temperature is obtained from the common temperature by adding 273 in the centigrade or 460 in the Fahrenheit scale; thus,

30 deg. C. = 273 + 30 = 303 deg., absolute.
60 deg. F. = 460 + 60 = 520 deg. absolute.

Relation of Volume and Absolute Temperature of Air and Gas—The law commonly known as **Gay Lussac's or Charles' law** makes the volume of all gases and air, under constant pressure, vary directly as the absolute temperature.

This relation is clearly illustrated in the accompanying figure, which assumes a volume of 460 cu.ft. of air or gas at 0 deg. F., corresponding to the absolute temperature at that point. It will be observed that this volume expands and contracts exactly as the absolute temperature rises or falls, except at the lowest temperatures approaching the liquefaction of the air or gas where the law naturally fails, owing to the changing state of the matter.



Inquiries of General Interest

Pennsylvania Mine Law Amended

There has been much discussion recently in regard to the amendment of the Pennsylvania mining law relating to the need of certification of mine foremen and other mine officials. It is claimed that this amendment so modified the present bituminous law that coal companies are now permitted to hire persons to act as mine foremen, assistant mine foremen or firebosses who have not passed a state examination and do not hold a certificate of competency, as was heretofore required by law.

Will you kindly explain this amendment, stating its effect and purpose?

INQUIRER.

——, Penn.

The law to which correspondent refers is an act amending art. 4, sec. 1; art. 5, sec. 1, and art. 24, sec. 9, of the bituminous mine law of Pennsylvania. This amendment passed by the last legislature was approved by Governor Brumbaugh, June 1, 1915.

The action taken by the legislature came as the result of the difficulty arising in the adoption of the new Workman's Compensation Act in the state. This act imposes on all operators working under its provisions a liability for death by accident or for injury sustained by workmen while performing their duties in and about the mine. There has always been some contention as to how far the authority of the company extended over the actions of the mine foremen and firebosses in their employ. The reading of the bituminous mine law (1911) gave the foreman "full charge of all the inside workings and of the persons employed therein." The law also gave the fireboss virtual control over the operation of the mine, in respect to dangers arising from the accumulation of gas.

In connection with the new compensation law, it has been objected by the operators that if they were to be held liable for accident to mine workers, they must be permitted to employ mine foremen, assistant mine foremen and firebosses who in their judgment are capable of performing the duties imposed on them by law and of operating the mine safely and economically.

The following extracts from those sections of the law to which reference has been made will show the changes made in the wording of the law and the additions thereto. Where the words have been omitted or changed, this will be indicated in a footnote giving the original wording of the law. Additions made to the reading of the old law are marked by parantheses. It will not be necessary to repeat the entire sections of the law, but a series of dots, or ellipses, will show where portions are omitted which are identical with the old law. The amended sections are the following:

Art. 4, sec. 1. In order to secure efficient management and proper ventilation of the mine . . . the operator or the superintendent shall. employ a competent and practical mine foreman . . . (who shall be under the supervision and control of the operator). The mine foreman shall have full charge of all the inside workings and the persons employed therein, (subject, however, to the supervision and control of the operator), in order, etc. . . . If the mine is generating explosive gas . . . the mine foreman must possess a first-grade mine-foreman's certificate, (or be a person who, in the judgment of the operator, is a person equally competent with the holders of such certificates). If the mine is nongaseous the mine foreman must possess either a first-grade mine foreman's certificate, or a second-grade mine foreman's certificate, (or be a person who, in the judgment of the operator, is fully competent with the holders of such certificates).

When the mine workings become so extensive that the mine foreman is unable, etc. . . . he shall have the right to employ a sufficient number of competent persons to act as his assistants, who shall be under his instructions (and the operator's instructions) in carrying out the provisions of this act. If the mine is generating explosive gas . . . the mine foreman's assistants must possess first-grade assistant mine foremen's certificates, (or be persons who, in the judgment of the operator, are equally competent with the holders of such certificates).

In case of the necessary temporary absence of the mine foreman, he may deputize . . . his assistant, who shall perform all the duties of the mine foreman; (and have the right to hire and discharge employees; the management of the mine and the direction of the working forces are vested exclusively in the operator; and no person or persons, association or associations, organization or organizations, corporation or corporations, shall interfere with or attempt to interfere with, abridge or attempt to abridge, in any manner whatsoever, such right; provided, that this act shall not invalidate any existing contract).

Art. 5, sec. 1. In such portions of a mine wherein explosive gas has been generated . . . the mine foreman shall employ a fireboss or firebosses, whose competency to act as such shall be evidenced by a certificate of qualification from the Department of Mines on the recommendation of the examining board, as provided for in sec. 6, art. 24 of this act; (or a person or persons who, in the judgment of the operator, is equally competent with the holders of such certificates). It shall be the duty of the fireboss to examine carefully, etc. . . . The examination shall begin within three hours prior to the appointed time[1] to enter the mine. The fireboss shall examine for danger, etc. [No further change in this section.]

Art. 24, sec. 9. It shall be lawful[2] for any operator, manager or superintendent to employ as mine foreman in any mine, or as assistant mine foreman in any gaseous mine, any person who has obtained the proper certificate of qualification or service required by this act, (or any person who, in the judgment of the operator, is equally competent with the person or persons who are the holders of such certificates); provided, that all persons holding certificates etc. . . . and it shall be unlawful for any operator, manager, superintendent or mine foreman to employ as fireboss any person who has not obtained the proper certificate of qualification required by this act, (or a person who, in the judgment of the operator, is equally competent with the person or persons who are the holders of such certificates); provided, that all persons holding certificates, etc. [No further change in this section.]

This act shall not go into force or become operative until the first day of January, A. D. 1916.

All acts or parts of acts inconsistent with this act are hereby repealed.

The changes made in the reading of the bituminous law (1911) are not as drastic as may at first appear. On sober, second thought they are only such as are reasonable when considered in connection with the obligations imposed on the operator of a mine by the provisions of the Workmen's Compensation Act of 1915.

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[1] The words "for each shift," in the old law, have been dropped from the amendment.

[2] The old law reads "unlawful."

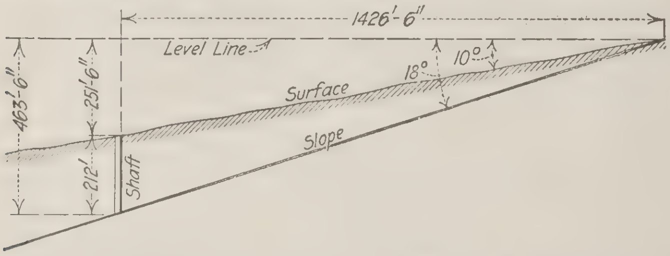
Examination Questions

Miscellaneous Questions

(Answered by Request)

Ques.—A seam of coal 8 ft. thick crops out at the north line of a tract of land. The seam dips 18 deg. south, while the surface has a regular dip of 10 deg. in the same direction. How far south of the north line must you go to sink a shaft so that it will cut the seam at a point 1500 ft. measured on the pitch from the crop, and what will be the depth of the shaft from the surface to the bottom of the slope?

Ans.—Since the seam has a regular dip of 18 deg., the horizontal distance, corresponding to a distance of 1500 ft. measured on the pitch of the seam, is $1500 \times \cos 18 \text{ deg.} = 1500 \times 0.951 = 1426.5$ ft., as shown in the accompanying figure. The elevation of the surface at this distance from the crop line for a regular dip of 10 deg. in the same direction is $1426.5 \times \tan 10 \text{ deg.} = 1426.5 \times 0.1763 = 251.5$, as indicated in the figure. The corresponding elevation of the foot of the slope or bottom of the shaft can now be found in two ways:



$$1500 \times \sin 18 \ deg. = 1500 \times 0.3090 = 463.5 \ ft.$$
$$1426.5 \times \tan 18 \ deg. = 1426.5 \times 0.3249 = 463.5 \ ft.$$

The elevation of the surface at the shaft, and that of the shaft bottom, as thus found, are the respective vertical distances of these points below the crop line at the surface. The depth of the shaft is found by subtracting the surface elevation from that of the bottom of the shaft. Thus $463.5 - 251.5 = 212$ ft.

Ques.—If a pump will lift water 34 ft. at sea level, with a barometer reading of 30 in., how high will it lift water at an altitude of 5400 ft.?

Ans.—This is not a fair question to ask candidates in examination, unless they are permitted the use of textbooks or are given the corresponding barometer reading at an elevation of 5400 ft. above sea level. The barometer reading for this elevation, under normal atmospheric conditions, as taken from tables, is 24.5 in. The draft of the pump, as given for sea level (34 ft.) is the theoretical suction or lift. The corresponding lift at an altitude of 5400 ft., assuming a barometer reading of 24.5 in., is

$$\frac{24.5}{30} \times 34 = 27.6 \ ft.$$

In practice a common rule for determining the suction or lift of a pump is to estimate the lift in feet as nine-tenths of the barometer reading in inches, or in this case: At sea level, $0.9 \times 30 = 27$ ft.; at an altitude of 5400 ft., $0.9 \times 24.5 = 22$ ft.

Ques.—The grade of an incline is 7 per cent.; the length of the incline is 2000 ft.; the weight of the rope 4000 lb.; the weight of the full car 1800 lb. How many cars must there be in a trip to make this plane self-acting?

Ans.—The force acting to produce motion on a self-acting incline is the unbalanced weight of the coal in the loaded cars, the weight of the cars themselves being balanced on the two sides of the incline. The forces resisting motion are the unbalanced weight of the rope when the empty trip is at the bottom of the incline and the friction pull of the entire moving load, which includes the weight of the loaded and empty cars and that of the rope.

The question does not state the weight of the empty car, which must therefore be assumed as, say 600 lb. This makes the weight of coal carried in each car $1800 - 600 = 1200$ lb. Calling the number of cars on each side of the incline n, the weight of coal in a single trip is $1200 n$, and the corresponding gravity pull producing motion on a 7 per cent. grade, is, therefore, $1200 n \times 0.07 = 84 n$ lb.

The gravity pull of the rope, which resists motion, is $4000 \times 0.07 = 280$ lb. Taking the weight of a loaded car as 1800 lb. and that of an empty car as 600 lb., the total weight of one loaded and one empty car is $1800 + 600 = 2400$ lb., and the total moving load on the incline, including that of the rope, is $2400 n + 4000$. The friction pull may then be assumed as $^1/_{40}$ of the load, which gives

$$\frac{4000 + 2400 n}{40} = 100 + 60 n.$$

Then, equating the gravity pull of the coal with the gravity pull of the rope and the friction pull of the entire moving load, gives

$$84 n = 100 + 60 n + 280$$
$$24 n = 380$$
$$n = \frac{380}{24} = say \ 16 \ cars.$$

Under the assumed conditions, therefore, there are 16 loaded and 16 empty cars, making a total of 32 cars on the incline.

Ques.—What units of work are necessary to overcome the friction of an airway 6 ft. square, 1000 ft. long, when the quantity of air passing is 10,800 cu.ft. per min.?

Ans.—The perimeter of this airway is $4 \times 6 = 24$ ft., and its rubbing surface $24 \times 1000 = 24{,}000$ sq.ft.; its sectional area is $6 \times 6 = 36$ sq.ft. The velocity of the air current in this case is $10{,}800 \div 36 = 300$ ft. per min. The pressure required for the circulation is, therefore,

$$p = \frac{0.00000001 \times 24{,}000 \times 300^2}{36} = 0.6 \ lb. \ per \ sq.ft.$$

The corresponding units of work are, therefore,

$$u = 10{,}800 \times 0.6 = 6480 \ ft.\text{-}lb. \ per \ min.$$

Coal and Coke News

Washington, D. C.

The Federal Reserve Board has issued a new regulation relating to discountable paper which is already receiving widespread attention in all branches of business and is likely to be particularly useful in the financing of the coal industry, as business customs already existing there seem to be such as will permit the successful use of the trade acceptances without too serious obstacles.

In the new circular and regulation, provision is simply made for the direct rediscounting by Federal Reserve banks of paper drawn against sales of goods and accepted by purchasers. Such accepted bills are made eligible for discount or purchase by a Federal Reserve bank provided they bear the endorsement of a member bank. In issuing the new regulation, the board announces that it does so in the belief that the new policy will lead to the broadening of the use of two-name commercial paper by the country at large.

The trade acceptance is defined as a bill of exchange drawn to order, leaving a definite maturity and payable in dollars in the United States, the obligation to pay it having been accepted by an acknowledgement written or stamped and signed across the face of the instrument by the company, firm, corporation or person upon whom it is drawn; such agreement to be to the effect that the acceptor will pay at maturity according to its tenor such draft or bill without qualifying conditions.

A trade acceptance, to be eligible for rediscount under section 13 of the Federal Reserve Act, with a Federal Reserve Bank at the rate to be established for such acceptances must be endorsed by a bank which is a member of the Federal Reserve system, must have a maturity at the time of rediscount of not more than 90 days, and must be accepted by the purchaser of the goods who must certify that the indebtedness represented by the bill was expressly incurred in the purchase of goods.

The trade acceptance must bear on its face or be accompanied by, evidence in form satisfactory to the Federal Reserve Bank that it was drawn by the seller of goods on the purchaser of such goods. The evidence in question may consist of a certificate accompanying the acceptance in question to the effect that the obligation of the acceptor of the bill arises out of the purchase of goods from the drawer.

The new regulation, thus framed, is intended to afford more direct facilities to business men in obtaining credit through rediscount than are now available and will bring them into closer communication with the reserve banks.

PENNSYLVANIA

Anthracite

Hauto—In order to conserve a supply of water to keep the mines running during dry spells, which seem to come with great regularity during the past several years, the Lehigh Navigation Electric Co. has built an immense reservoir at a cost of $500,000. It has now been discovered that the reservoir has a leak so extensive that it is estimated it will entail an expenditure of $50,000 to render the storage plant entirely serviceable.

Centralia—While engaged in stripping operations over an old breast of the Lehigh Valley Coal Co., the ground caved in and four men employed by a contracting firm, were carried down into the mine. They all escaped serious injury except Michael Hausheck, who being caught beneath a mass of earth was smothered to death. His body was recovered several hours after the accident.

Girardville—Packer No. 5 colliery of the Lehigh Valley Coal Co. is shut down because the 600 employees have gone on a strike. Two men were discharged for disobedience of orders and the other workmen then threw down their tools.

Shenandoah—A series of accidents occurred in the mines here in one day recently in which 8 men were badly injured. The most seriously hurt was Charles Rotomosky. It is feared that he has been blinded for life.

Pottsville—W. R. McTurk & Co. recently sold all of the outside equipment, including buildings, at the Tomhicken mines, as it has been determined that the operation can no longer be profitably worked.

Tamaqua—Caught in an explosion in the No. 4 mine of the Lehigh Coal & Navigation Co. recently four men were so badly burned that they were removed to the Coaldale Hospital. Four others were severely burned, but had their injuries treated in their homes.

All the collieries of the Lehigh Coal & Navigation Co. in the Panther Creek Valley began operation in full on July 12, after a ten day lay-off. It is also reported that the business in sight is sufficient to warrant good working time for the remainder of the summer.

Bituminous

McClellandtown—The Puritan plant of the Puritan Coke Co. is making preparations to resume in full. The 84 idle ovens at the plant are to be fired. There are at this time 118 ovens in operation. The monthly production of the company is some 12,000 tons.

Gates—Orders have been issued by the Frick company to its officers at Gates, which has been idle for months, to prepare to resume in full forthwith. The output will be shipped direct to the Pittsburgh district. Superintendent Harry N. Boyd, of Lambert plant is to have charge of the operations at Gates.

Uniontown—Two hundred additional coke ovens have been ordered fired at the Frick plants contiguous to Uniontown. The list of plants affected includes Colonial No. 1. Continental No. 3; Edenborn; Hecla No. 3; Leisenring Nos. 1, 2 and 3; United; York Run, Hostetter and Whitney.

Five small coke plants near Brownsville have been ordered into full operation. The plants are: Garwood mines of the Etna Connellsville Co. at Simpson, shut down for over a year; Champion mines of the Connellsville Consolidated, near Brownsville; Grays Landing Connellsville Consolidated Nos. 1 and 2; Kathering works, Union Connellsville, at Simpson. At the five plants there will be something like 800 hitherto idle ovens fired. All the plants are owned by independent producers.

Pittsburgh—The properties of the Pittsburgh-Buffalo Co. were sold at public auction at Pittsburgh on July 15 to the Union Trust Co. of that city for $1,500,000, the only bid made. The sale was subject to a lein of a first mortgage made in 1909 to secure a bond issue of $2,500,000 of which bonds to the par value of $1,769,000 were issued and upon which there has been no interest paid since Aug. 2, 1913. The sale represents an outlay of nearly $3,500,000. The properties were exposed for sale in the rotunda of the Allegheny County court house under the direction of Attorney George H. Calvert the master named by the court. The holdings disposed of consist of the Marianna mine, the Francis mine, the Johnetta Mine, the Bertha mine and the Higbee tract. The first named is the largest containing about 5328 acres of coal. The mines are equipped with steel tipples and modern equipment. Included in the plant are 700 acres of surface upon which are erected the power plants, ovens, and houses of which 235 are built of brick. The properties were first offered for sale separately but there were no bids, after which they were offered in a lump. Attorney James H. Beal after the sale opened made the only bid of $1,500,000 as the representative of the Union Trust Co. There being no other bidders his offer was accepted. The Union Trust Co. holds the first mortgage on the property.

Brownsville—After a suspension of a year and a half the Garwood plant of the Etna Connellsville Coke Co. has resumed operations in full. There are 119 ovens at this plant and Superintendent C. L. Patterson is having a hard time in recruiting sufficient labor with which to fully man the plant.

Ferndale—Miners employed by the Smokeless Coal Co., in whose workings an explosion occurred May 24, have been equipped with electric lamps. These lamps, however, have been supplied the miners only in those sections where there is supposed to be gas.

WEST VIRGINIA

Charleston—All the coal mines operated on Kelley's Creek by the Sunday Creek Co. were recently closed, and will not resume operations before fall, if even then. Over 300 miners living at Cedar Grove have been thrown out of employment, while store clerks, teamsters and others are included among the number losing work. It is rumored that the Monarch Mine will also suspend operations for the summer.

ALABAMA

Birmingham—James L. Davidson, secretary of the Coal Operators Association is in Montgomery in the interest of pending legislation of interest to the operators. The two-weeks pay-day bill and the commissary check bill are measures before the body that are opposed by the coal operators. The Recess Investigating Committee has just made its recommendations, which urge, that the convicts be removed from the lease system and that they be taken from the coal mines and worked on the roads.

Edgewater—The Edgewater mines of the Tennessee Coal & Iron Co. are now working six days a week after being on short time for several months. The capacity of the mine is 2500 tons a day. About 300 people attended the annual outing and institute of the Alabama Coal Operators' Association at Edgewater. Lectures on scientific subjects dealing with mining and mine welfare work was a feature of the program. A demonstration was made of a dust explosion by black powder and the results from use of permissible explosives. Special papers on interesting subjects were read by experts.

KENTUCKY

Fleming—The Elkhorn Mining Corporation plant is now running full time in order to fill the large orders received within the past two weeks. It is expected that a record run will be made the remainder of the year.

Jenkins—The Consolidation Coal Co.'s plants here and at McRoberts are operating full time in their efforts to fill the big orders for their product received lately. More coal is now being shipped from the field around Jenkins than at any time in its history. Railroads are taxed to handle the tonnage.

OHIO

Bridgeport—The Loraine Coal & Dock Co. has decided to board up one of its largest mines until April of next year. This mine employed about 450 men when working to its full capacity. The Loraine Coal & Dock Co. is operating several other mines, but it is said the continuity of operation is precarious.

Pipe Creek—The Johnson Mine began work July 16, after being idle since April of 1914. For some time prior to the opening of this mine, men have been employed in getting things in proper condition to begin operations.

Steubenville—Fire almost totally destroyed the buildings of the Strabley Coal Co.'s mine recently, entailing a loss of approximately $10,000. The power house and the equipment contained therein and a part of the coal tipple were consumed. This mine employs about 70 men, who will be thrown out of work until the necessary buildings can be erected and repairs made.

Columbus—During the past week the Ohio public utilities commission has been securing information from local coal companies relative to alleged discrimination against Ohio in favor of West Virginia in the matter of coal rates. The decision of the Ohio Supreme Court, handed down recently, which confirms the right of the commission to adjust freight rates, is expected to bring about numerous requests for regulation from the coal shippers of the state. The Sunday Creek Co., declares that the complete suspension of its mines in Ohio for some time to come depends to a great extent upon the action of the commission. Unless the railroads decide to carry the question into the federal courts, the reduction of rate on commercial coal from the Nelsonville assembling yards in the Hocking Valley to Toledo, from $1 to 85c., will go into effect in the near future.

Nelsonville—A local strike which caused the closing down of two mines of the New York Coal Co. has been settled after a week's suspension. These mines are connected with the only active coal washery in the Hocking Valley, and the trouble was over the matter of hours for day labor.

Tropic—Making the assertion that the present mining scale, together with the Green mine run law has destroyed the coal industry in Ohio, the operators of the Tropic mine, have issued a circular showing that the payroll of the mine for June, 1915, was $457.05, as compared with $19,642.55 in 1913. As there was a general suspension in Ohio in the same month of 1914, that year offers no basis of comparison.

New Lexington—The collapse of the tipple at No. 1 San Toy mine a few days ago, shortly after the men had resumed work after a year's idleness, will necessitate further idleness until the damage can be repaired. This will take about a month.

Athens—Suit has been filed by Edgar Stark, as trustee under certain mortgages and deeds of trust executed by the Luhrig Coal Co., against that company for a receivership to take charge of the company's property pending the adjustment of claims based upon outstanding obligations. Leander D. Oliver, of Cincinnati, has been appointed receiver.

COLORADO

Denver—State coal mine inspector James Dalrymple, recently, revoked the certificate issued to Lindsey Connor, shotfirer in the Delagua mine of the Victor-American Fuel Co. after repeated warnings that his carelessness in firing was endangering the lives of miners. Dalrymple is striving to reduce the high mortality in Colorado coal mines which, in 1913, was 8.6 per 1000, and in 1914, was 7.0 per 1000. He states that conditions in Boulder and Weld counties especially have greatly improved.

PERSONALS

A. B. Lamb, state mine inspector, will be transferred from the 13th district at Shenandoah, to the 18th, with offices in Pottsville.

John Green, of Belleville, Ill., 74 years old, has passed an examination as coal mine examiner or fireboss. He is the oldest man who has ever taken the examination in Illinois. Green was formerly a member of the Legislature.

William T. Dunn, formerly tool-steel expert for the Carpenter Steel Co. in Boston and New England, has been appointed by the International High Speed Steel Co. of New York, district sales agent for New England and eastern Canada.

George L. Walkenshaw has resigned as superintendent of the Eastern Kentucky Coal Co.'s mines at Torchlight, Ky., and has been succeeded by R. C. Simpson. Grover Sea also has resigned as mine foreman and has been succeeded by A. B. Walkenshaw.

W. S. Robertson was appointed secretary of the American Locomotive Co. at a meeting of the board of directors recently held. This appointment fills the vacancy caused by the resignation of T. B. Denny, which was accepted at the same meeting.

I. W. Copelin, who for years was active in the coal trade of Toledo but who retired a couple of years ago, has brought suit against the Pennsylvania R.R. Co. for damages amounting to $10,000 which Mr. Copelin alleges he suffered during a collision at Woodville, just outside the city of Toledo a couple of years ago.

William Hamilton, 29 years of age, was buried for 45 min. under a fall of roof in Mine No. 2 of the Union Mining Co. on July 14. Hamilton was completely covered and the rescuing party were amazed when they reached him to find that he was not seriously hurt, his worst injury being a broken arm. Twelve carloads of soft roof coal were removed before the man was reached.

Ralph T. Coe, manager of the Canadian Sirocco Co. Ltd., Windsor, Ont., since the organization of the company, has resigned to enter the engineering service and sales field in New York State. Mr. Coe has been appointed district manager for Warren, Webster & Co. and the American Blower Co. and will have offices at 519 Insurance Bldg., Rochester, and 19 Live Stock Exchange Bldg., Buffalo, N. Y.

Stewart K. Smith, a mining engineer of St. Louis, has been appointed receiver of the Consolidated Indiana Coal Co., a corporation of the State of Maine, owning over 10,000 acres of coal rights and surface in Sullivan County, Indiana, with four operating mines; 6500 acres of undeveloped coal lands in Franklin County, Illinois, and 4500 acres of coal rights and surface in Marion and Lucas Counties, Iowa, with one operating mine. The receivership took effect on July 14.

White L. Moss, who has been vice-president and general manager of the Continental Coal Corporation, which owns the mines on Straight Creek, Ky., has resigned and Max Barker, of Louisville, chairman of the executive committee, has taken charge until the directors make permanent arrangements. The miners are still out on their demand for a 10 per cent. increase. In the same county the New Jellico Co. has given its men the 10 per cent. increase demanded. There are 600 miners still on strike in the county however.

Governor Dunne, of Illinois has appointed the following delegates to the 18th annual session of the American Mining Congress, to be held in San Francisco Sept. 20, 21 and 22: Frank Farrington, Springfield; J. H. Walker, Springfield; T. J. Reynolds, Collinsville; J. W. Starks, Georgetown; T. H.

Devlin, Assumption; W. T. Morris, Duquoin; James Lord, Farmington; J. F. Morris, Springfield; R. J. Wilson, Marissa; John Tuttle, Harrisburg; Walter Nesbit, Belleville; Thomas Clayton, Royalton; Thomas Kane, Harrisburg; Michael Fahy, Toluca; John F. Demlow, Danville; Barney Murphy, Pana; Joseph Pope, Belleville; Paul Smith, Marion; James Kellett, Gillespie; James Tyler, St. David; T. L. Jones, Ladd; David Ross, Springfield; John Bolander, Pekin; James Forester, Duquoin; Thomas Jeremiah, Willisville; Rice Miller, Hillsboro; A. J. Moorshead, East St. Louis; J. P. Reese, Gillespie; H. H. Devereaux, Springfield; Joseph Randall, Belleville; Julius G. Scott, Bloomington; Hugh Murray, Mt. Vernon; C. F. Lynch, Danville; Frank Peabody, T. J. O'Gara, Glen W. Traer, C. M. Moderwell, C. Robert Silsberg, C. W. Wardley and W. C. Niblank, all of Chicago.

OBITUARY

Robert Childs Scott, secretary and treasurer of the Morris Machine Works of Baldwinsville, N. Y., died recently.

The body of Capt. Bradey Williams, of Covington, Ky., pilot of the Monongahela River Consolidated Coal & Coke Co., steamer "Fulton," who was lost with the boat during a recent hurricane, has been recovered.

Adam S. Boyd, 55 years of age, division superintendent of the Philadelphia & Reading Coal & Iron Co., and in charge of the Shenandoah, Gilberton, Girardville and Ashland districts, and residing in Ashland, dropped dead on the evening of July 18 from heart failure after making an automobile trip from Ashland to Shenandoah. Mr. Boyd had risen from the ranks and at the time of his death was one of the best-known and most trusted coal men throughout his vicinity.

Frank A. Hill, president of Madeira, Hill & Co., extensive coal operators with general offices in Philadelphia, died in Pottsville, Penn., on the 13th inst. Mr. Hill, who was 56 years old, died of agina pectoris, superinduced by acute indigestion. He was an engineer of note, having begun his professional career with the Philadelphia & Reading Coal & Iron Co. Some time afterward he took charge of extensive bituminous properties in Virginia, returning to Pottsville in 1907, entering the firm of Madeira, Hill & Co. The work executed by him at Stanton colliery stands as a type of the highest grade of engineering skill in the anthracite region. In addition to having been a member of the Anthracite Geological Survey, he also took a prominent part in the affairs of the American Institute of Mining Engineers.

TRADE CATALOGS

The William M. Gokey Shoe Co., Jamestown, N. Y. Catalog No. 39. Illustrated, 36 pp., 4x9 in.

The Ensign-Bickford Co., Simsbury, Conn. "Deep Well Blasting." Illustrated, 48 pp., 6x9 in.

The Keystone Blue Paper Co., Philadelphia, Penn. "Samples of Blue Process Paper." Illustrated, 18 pp., 3½x8 in.

The William M. Gokey Shoe Co., Jamestown, N. Y. "Gokey Golf and Athletic Catalog No. 38." Illustrated, 24 pp., 3¾x7 in.

The Mesta Machine Co., Pittsburgh, Penn. "Horsepower Charts for Power Transmission Machinery." Illustrated, 4 pp., 6x9 in.

The Howells Mining Drill Co., Plymouth, Penn. Supplement 21,015. Catalog No. 28. "The Spry 'C' Post Drill." Illustrated, 4 pp., 6x9 in.

The Howells Mining Drill Co., Plymouth, Penn. "Howell Noncorrosive Mining Engineer's and Surveyor's Spads." Illustrated, 8 pp., 3¾x6 in.

Manzel Bros. Co., 315-319 Babcock St., Buffalo, N. Y. "The Manzel Sight Feed Oil Pump for Cylinder Lubrication. Class H-A." Sixteen pages, 3½x6¼ in., illustrated.

PUBLICATIONS RECEIVED

The Mining Law of the State of West Virginia, compiled by Earl A. Henry. Unillustrated, 62 pp., 3½x6¼ in.

Department of the Interior, U. S. Geological Survey. "Fuel Briquetting in 1914," by Edward W. Parker. Unillustrated, 3 pp., 6x9 in.

Board of Directors of City Trusts of the City of Philadelphia. "Forty-fifth Annual Report, for 1914." Unillustrated, 338 pp., 6x9 in.

State of Washington. "Report of the State Inspector of Coal Mines, Biennial Period Ending Dec. 31, 1914." Illustrated, 117 pp., 6x9 in.

Department of the Interior, U. S. Geological Survey. "The Production of Mica in 1914," by Douglas B. Sterrett. Unillustrated, 10 pp., 6x9 in.

Department of the Interior, U. S. Geological Survey. "The Recovery of Secondary Metals in 1914," by J. P. Dunlop. Unillustrated, 5 pp., 6x9 in.

Department of the Interior, U. S. Geological Survey. "The Production of Chromic Iron Ore in 1914," by J. S. Diller. Unillustrated, 15 pp., 6x9 in

Department of the Interior, U. S. Geological Survey. "The Production of Phosphate Rock in 1914," by W. C. Phalen. Unillustrated, 14 pp., 6x9 in.

Department of the Interior, Bureau of Mines. "Permissible Explosives Tested Prior to Mar. 1, 1915," by Spencer P. Howell. Unillustrated, 16 pp., 6x9 in.

Canada Department of Mines. Memoir 53. "Coal Fields of Manitoba, Saskatchewan, Alberta and Eastern British Columbia," by D. B. Dowling. Illustrated, 142 pp., 6½x10 in.

Industrial Commission of Ohio, Department of Investigation and Statistics, Report No. 4. "Industrial Accidents in Ohio, Jan. 1 to June 30, 1914." Illustrated, 324 pp., 6x9 in.

Department of the Interior, U. S. Geological Survey. "The Production of Barytes in 1914, with a note on Strontium Ore and Salts," by James M. Hill. Unillustrated, 5 pp., 6x9 in.

Department of the Interior, Bureau of Mines. "Monthly Statement of Coal Mine Fatalities in the United States, April, 1915," compiled by Albert H. Fay. Unillustrated, 12 pp., 6x9 in.

Department of the Interior. U. S. Geological Survey, Bulletin 581. "Contributions to Economic Geology, 1913. Part II, Mineral Fuels," by Marius R. Campbell and David White. Illustrated, 187 pp., 6x9 in.

INDUSTRIAL NEWS

St. Louis, Mo.—Joseph P. Ryerson & Son, of Chicago, Ill., is making a considerable addition to the firm's St. Louis plant.

Pittsburgh, Penn.—It is reported that ore, coal, coke and miscellaneous industrial traffic is showing increases over the lines of the Pittsburgh & Lake Erie road to and from Lake ports.

Gary, Ind.—The American Sheet & Tin Plate Co. mills began operating to capacity on July 12. Fires were lighted in the remaining 70 coke ovens, and 10,000 tons of coal per day will be made into coke and the byproducts thereof.

Philadelphia, Penn.—Laden with coal, the power barge "Princess," bound from Baltimore to Pedrickton, N. J., sank recently in Oldman's Creek. The barge was later pumped out and floated and her cargo of bituminous coal salvaged.

Philadelphia, Penn.—Financial institutions of this city interested in the securities of the Continental Coal Co. have been placed on a committee for the protection of the holders of the first mortgage 5 per cent sinking fund bonds of the company.

Central City, Ky.—Coal traffic out of this section over both the Louisville & Nashville and the Louisville, Henderson & St. Louis is increasing and not a day passes when extra trains are not being made up. It is the belief in this section, though not confined by authoritative statements, that the coal is for the export trade.

St. Louis, Mo.—In a suit brought by the Big Muddy Coal & Iron Co. against the City of St. Louis and several individuals, to settle the question of title to a block of valuable land in Carondelet, pending in Judge Taylor's division of the Circuit Court, an order has been granted for the taking of depositions in Kentucky.

Moundsville, W. Va.—The James H. Leighty tract of coal land in Cameron and Webster districts was sold in front of the courthouse door by Auctioneer S. N. Cunningham, acting for Attorney Walter A. McGluphy, as trustee, recently for $18,000. This price is about $30 per acre. The purchasers were Messrs. Chaplin, Goldberg and Honecker.

Williamsburg, Ky.—Leading coal dealers from Ohio and Michigan formed a party which recently visited the operations of the Gatliff Coal Co. and the Mahan Jellico Co. at Gatliff and Packard, Ky., mines controlled by the Southern Coal & Coke Co., of Knoxville. E. C. Mahan, head of the Southern company's sales department, was host to the party.

Harrisburgh, Penn.—Arrangements were made recently by Auditor-General Powell and representatives of the Philadelphia & Reading Coal & Iron Co., and other anthracite producers for the filing of the monthly reports of production under the new state hard-coal tax. For the present a few days allowance will be given after the 15th of the month for the filing of the reports, but later on the 15th will be adhered to.

Toledo, Ohio—August is the month chosen for the annual picnic of Toledo coal dealers. It has been determined once more to hold the affair at Sugar Island in conjunction with the Detroit dealers as was done last season. A meeting was held in this city recently at which time it was decided to hold the joint picnic. Committees have been appointed to secure prizes and arrange for the athletic sports and general entertainment which is a feature of this affair.

Mahoney City, Penn.—Crossing the street after having called on a neighbor at Trenton, Penn., recently, Mrs. Andrew Matruck, accompanied by an infant, was engulfed in a mine cave 30 to 40 ft. deep when the roadway suddenly caved in beneath her. With rare presence of mind the woman tossed her child to safety, but received serious injuries herself. The cave-in was due to the weakening of the roof of the Park Place mine, over which the entire village of Trenton is built.

Williamson, W. Va.—The month of June, 1915, established the largest month's coal tonnage for the Norfolk & Western R.R. in the history of the road, exceeding the previous record by over 170,000 tons. In September, 1914, 2,509,916 tons were handled, but in June of the present year 2,680,465 tons were hauled. In 1914, the banner year of the road, it handled 25,471,969 tons of coal. The outlook now is that during the last half of 1915 the output will increase from month to month and establish by a large margin a new high record.

Chattanooga, Tenn.—Nine of the Chattanooga Gas & Coal Products Co. by-product coke ovens are now operative at Alton Park. These are being run on their own gas now, after having been heated for nearly a month with gas from the Chattanooga Gas Co.'s plant in the city. Twelve tons of coke a day are being made in each oven and when the plant is in full operation coke will be produced at the rate of 400 tons daily. This is the first plant to use the new Roberts ovens and is to be visited by a large party of iron steel and coal products manufacturers.

Uniontown, Penn.—The sale of 72.08 acres of coal by the receivers of J. V. Thompson has been confirmed by the Fayette County, Penn., courts on petition of the receivers. For the sale of coal in South Union Township to the trustees of the estate of the late W. J. Rainey the receivers of Mr. Thompson will receive $129,733, or about $1665 per acre. There is a mortgage against the tract held by the Citizens Title & Trust Co. of Uniontown for $110,000. The bank will receive all of the purchase money in satisfaction of the mortgage and interest with the exception of $15,000 cash which will go to the receivers.

Cincinnati, Ohio—The sale of the Marmet Coal Co.'s properties to the New York syndicate formed to organize the Kanawha Splint Coal Co., with a capital stock of $20,000,000, to take over the Marmet and other properties, has fallen through for the time being, owing to the failure of the purchasers to make the initial payment. The amount settled upon as the purchase price of the Marmet properties was $1,500,000, and it was agreed that 25 per cent. of this should be paid at once, but this was not done. The property may therefore be offered for sale again, bids to be received up to Sept. 21, but it is believed that the New York concern will by that time be able to complete the deal.

Pittsburgh, Penn.—A bill in equity was filed July 15 in Common Pleas Court by the Harris Pump & Supply Co. against the Meadowlands Coal Co. in which the apointment of a receiver was asked for. James S. Boggs was named by the court as a temporary receiver. The plaintiff has claims amounting to $1152.28 against the company which it has been unable to meet. It is alleged that the statement of the company on July 1 showed that its liabilities amounted to $725,860.25, while the assets consist of valuable coal lands and equipment. It is alleged that owing to the depression in business the coal company had been unable to operate its mines to full capacity, with the result that income had been curtailed making it difficult to meet outstanding obligations.

Philadelphia, Penn.—The Custom House in its report for the fiscal year ending June 30, 1915, shows that during the year there was exported 2,133,081 tons of bituminous coal, which is 56,155 tons less than last year. The decrease in tonnage for the year is due to the fact that at the beginning of the war in Europe last August practically all tidewater shipments ceased, including the coaling of vessels with bunker coal. However, within the past two months the export tonnage has been mounting rapidly. This fact is borne out by the June statement of idle cars issued by the American Railway Association, which shows the number of cars standing July 1 as 83,541, compared with 105,779 for the month previous, and of this total decrease of 24,817 idle cars, 22,238 were coal cars.

Philadelphia, Penn.—Shipments of bituminous coal to the countries of South America are on the increase, and it is altogether likely that this business will be a permanent feature of the American trade, even after the war. There is not a doubt of the ability of American coal to compete with fuel from any part of the world. The shipments to Brazil in particular have increased at a rapid rate. Formerly less than 10,000 tons per annum were exported there, but for this month alone almost 20,000 tons have been shipped, five vessels having left within the last few days with 19,000 tons in their holds. The bulk of the coal for Brazil has heretofore been shipped from Southern ports, but an adjustment in the freight rate has brought a large portion of the business to this port.

Denver, Colo.—One month age, the state public utilities commission put into effect a new schedule of freight tariffs on Colorado railroads with special application to the coal-hauling roads. These rates are considered fair by retailers, shippers and consumers in that they take account of distances hauled while equalizing the opportunities for large and small producers. The Colorado & Southern Ry. now comes forward with a petition for a reopening of the hearings in the matter, making special plea for readjustment of its freight rate on the long haul to Denver from the South Canon coal mine. Decision on this petition has not been made but it is not likely that any concession will be granted for the reason that such an act would become a precedent for the filing of numerous other similar complaints.

St. Louis, Mo.—The St. Louis Coal Club met recently at the American Annex and devoted the entire evening to a discussion of the city scale law. There was an attendance of about 100, with all branches of the trade represented. The sentiment was unanimous that the law is oppressive and accomplishes no good and ought to be wiped out or substantially modified. President Beddoe was authorized to appoint a committee to organize a campaign for the repeal of the law. He named Fred Kleine, W. H. Boehmer and W. H. Riester. A bill will be submitted to the Board of Aldermen in the fall, providing for the repeal of the present law, which requires coal men to pay 3c. for each load of coal that is weighed. The argument against the law is that the weighman's bond does not protect the dealer, who has to pay for the weighman's mistakes. Ten of the largest cities in the country, it is said, are not using city weigh tickets. A great many of the steam users in St. Louis have their own scales and payment is made on their weight, but the dealer has to pay for the city weigh tickets anyway. The law is said to cost the St. Louis dealers about $30,000 a year.

Frankfort, Ky.—Opposition to a proposed increase in the freight rate on coal from West Virginia points to central Kentucky over the Chesapeake & Ohio and the Louisville & Nashville railroads was brought out at a hearing held here on July 15 by Examiner H. E. Kelly, of the Interstate Commerce Commission. The Louisville & Nashville objects to the rate of $1.10, ordered by the commission several months ago suspending an advance; alleges that it gets $1.20 for a shorter haul from the eastern Kentucky coal field along its own lines and represents that participation by it in a rate of 10c. less from the West Virginia field discriminates against its own territory. The Cabin Creek Coal Co., the Carbon Fuel Co. and the Clear Creek Coal Co. of West Virginia, originated the complaint, and the Chesapeake & Ohio, some of the distillers and local dealers in Frankfort were represented, while other central Kentucky towns displayed much interest. The disadvantages resulting from the situation are illustrated by the fact that the state officials were unable to consider bids of the Clear Creek Co. and other West Virginia firms were not considered in letting contracts for certain state institutions because they were unable to guarantee a price, which must be dependent on rate changes. The West Virginia operators claim that the increase would bar them from a good market, while the Louisville & Nashville contends it is necessary to protect the Kentucky fields. The controversy is a phase of that which has been pending for a long time and the case may get to the higher courts before it is settled finally.

Coal Trade Reviews

General Review

Record breaking dullness prevails in anthracite. Indications of a further slowing up in bituminous also. The rapid expansion in export business continues. Middle Western markets well maintained in spite of the unusual heaviness.

The paucity of anthracite orders is evident in all directions. Conservative members of the trade agree that the summer dullness has scarcely ever witnessed such a combination of extremely low prices and light tonnage. Predictions as to the future are more uncertain. In view of the heavy stocks that are accumulating, the selling agencies are less confident of the anticipated rush for coal this fall, although labor difficulties may complicate the situation later. A slowing up in Lake shippings is throwing some additonal tonnage back on the producers, but if the fall movement out from the upper ports is of normal proportions the anthracite Lake movement will be about average.

General dullness still characterizes the bituminous situation in spite of occasional isolated reports of an improvement. The release of large tonnages of high grade coals, that have heretofore been held exclusively for export business, is significant evidence of the trend of conditions. A tremendous movement out of Hampton Roads, reaching to such proportions that the railroads are being crowded for a more rapid dispatch, is creating a distinctly optimistic tone at that point, but this business is restricted to only a few companies specializing in that trade and is not of sufficient proportions to affect the general market.

The salient feature of the Eastern bituminous situation is a light demand on contracts and surpluses at all points. Buyers are again showing indifference, and while there is still much conservatism among agencies regarding future business, concessions are offered to induce prompt buying.

With the steel industry in the Pittsburgh district operating at approximately full capacity, and the railroad and industrial demand slightly better, there is a moderately improved tone to the situation. There is obviously more coal going into consumption, while the export demand has proved a potent factor in relieving the pressure to a certain extent, but on the other hand the Lake movement is falling rapidly behind even the extremely low figures of last month, while prices are generally irregular with contracts being negotiated at still further concessions.

Buyers in Ohio feel confident of being able to purchase their requirements in the prompt market. The situation is also very unsettled and disturbed by various labor, legislative and freight rate difficulties. Market conditions are generally unsatisfactory, with the West Virginia companies absorbing most of the business that develops. The extremely light Lake movement is a particularly unfavorable factor in the situation. Heavy rains are delaying the crop movement to the South, but cotton operations are getting slowly under way, and are beginning to absorb some coal.

An unusual quietness prevails throughout the Middle Western markets, but the operators are meeting the situation by rigidly curtailing outputs down to well within the absorptive power of the trade, so that the situation is well in hand. Conditions toward the Northwest are somewhat brighter. The threshing and school demand are absorbing a larger volume of coal as the season advances and the time for price increases approaches.

A Year Ago—Anthracite rounds out the month in better form than anticipated. Eastern bituminous market at the lowest point for a long time. Situations at interior points picking up under the influence of the large crops and the long suspension in Ohio.

BUSINESS OPINIONS

Iron Age—The steel trade continues to gain ground, with enough lag at certain points in the industry to keep the advance from proceeding too rapidly. The feeling crops out here and there that prices on export business apart from war requirements may be put up too fast. The Steel Corporation's operations are now at about 91% of its ingot capacity, while the Carnegie Steel Company is employing close to 95% of such capacity. At Chicago the larger operations of the principal plants have been due to the transfer of orders that would naturally be rolled at Pittsburgh.

Am. Wool and Cotton Reporter—The Boston wool market is still displaying great firmness, but has possibly been a trifle quieter on account of the prospective opening up of the new fleeces and territory wools, which are rapidly coming in. The West is becoming absolutely cleaned up of the new clip at prevailing prices. At the London sales the best merinos brought 82 cents clean. Australian cable advices are strong. The cotton goods market is in a moderately quiet condition. The total sales have been somewhat larger than a week ago, but the goods were more spot or early delivery than previously.

Boston News Bureau—If any one doubts the genuineness of the current revival in business and trade he has only to examine the news of the day to be confounded. Everything nearly is on the constructive side of affairs from crop reports and railroads' gross and steel earnings to war orders. All doubt as to the breadth of improvement in the steel and iron industry, which was pretty well dispelled by the last tonnage statement of the Steel Corporation, must be removed by the six months' statement of the biggest independent, Republic Iron. The noteworthy fact that this strong showing is based solely on domestic business makes pertinent the idea so frequently expressed by trade authorities that the revival in the country's basic industry is in no sense a "war-order" movement.

Marshall Field & Co.—Current wholesale distribution of dry goods has maintained about the same volume as during the corresponding week a year ago. The attendance of merchants in the market has been large, indicating a lively interest in merchandise for warm weather retailing.

Dun's—Constructive factors accumulate and the international uncertainties, while making for caution, fail to check the growth of confidence in the future. With the basic influences still gaining in strength, the outlook steadily becomes brighter. It is mainly in sentiment that the general situation continues to reflect uniform and substantial betterment, but in actual commercial transactions there is also concrete evidence of improvement.

Bradstreet's—Factors making for expansion multiply. Evidence is provided by such facts as considerable improvement in industrial matters, virtually full movements in finished steel, overtime work in numerous war-order lines, smart activity at shipyards, freer distribution of seasonable goods, bounteous yields of foodstuffs, better collections, growing scarcity of labor, slightly larger sales of steam coal, absence of strain in money matters at the crop-moving season, increased construction of plants to take care of war orders, and some Western agricultural implement makers resuming operations, whereas a while ago it seemed as though work would not be started before September.

Southern Lumberman—Enlarged activity in general industrial lines, is having its effect on the hardwood market in sustaining it through the unusually dull summer period. While trade is not as active as could be desired, it is nevertheless steady. The settlement of the carpenters' strike at Chicago has injected much optimism into the yellow-pine market.

ATLANTIC SEABOARD

BOSTON

Pocahontas and New River market sags again and buyers are encouraged to wait.. Improvement not expected until September. Off-shore market has much influence on the situation. Surplus stocks in New England. Pennsylvania shippers again seeking orders. Anthracite orders scarce.

Bituminous—There has been another slackening in the Pocahontas and New River market the past week, with coal again more plentiful than orders at the loading ports. Among some of the shippers there have been small recessions in price in order to induce spot business but as usual with small result. New England buyers who have so far remained out of the market have resumed their stand-off attitude and it looks as if there would be at least one more noticeable sag their way before there is any pronounced improvement. There is just as much conservatism with regard to options for fall deliveries but for August business the prophets have turned out to be rather previous in their predictions of firmer prices.

The off-shore market is rather erratic. Steamers are somewhat easier to get, however, and a satisfactory export business is looked for in September.

That the export trade has slackened is apparent in the case of Georges Creek. Shippers of this grade have been well supplied with foreign orders all the season, most of the time to the exclusion of coastwise calls, but now there is a plentiful supply at tidewater and clearances for New England have almost resumed their former standing.

Where some of the quality grades from Pennsylvania were declining orders a fortnight ago they are again trying to secure spot business. Production has been well up to capacity and the West Virginia coals are still actively in the market at prices considerably lower than $2.85. While this continues the Pennsylvania grades will necessarily be somewhat hampered in placing any comprehensive volume of coal until conditions improve.

Water Freights show no pronounced change, although rates are hardly as firm. Seekers for tonnage find themselves obliged to pay the full rate, while owners with tonnage on their hands find it hard to place spot boats except at concessions. The approach of the hurricane season is expected to cause some sail tonnage to withdraw temporarily from the off-shore trade. The rate on bituminous in anthracite-carrying barges, Philadelphia to Boston, shows no sign of being reduced, it now being 5c. higher than a year ago.

Anthracite—The scarcity of orders is now plainly felt. Production is being held down, however, pretty closely to current needs and this adjustment will be likely to continue until the fall demand sets in.

Current prices on bituminous at wholesale are about as follows:

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines*	$0.85@1.40	$1.15@1.60	$1.67@1.77	
Philadelphia*	2.10@2.65	2.40@2.85	2.92@3.02	
New York*	2.40@2.95	2.70@3.15	3.22@3.32	
Baltimore*			2.85@2.95	
Hampton Roads*				$2.65@2.75
Boston†				3.55@3.68
Providence†				3.45@3.68

* F.o.b. †On cars.

BALTIMORE

Exports hold up well and month will probably show movement of over 200,000 tons. A better inquiry is developing, but coal is still offering very cheap.

Prices remain unsatisfactory despite an increasing call on contracts. Spot coals of all kinds except the very best grades are offering dangerously close to or below the cost of production. Low grade coals of Pennsylvania are commanding about 90 to 95c. to the trade at the mines, while Maryland and West Virginia coals of the less desirable kinds can be had as low as 75c. Slack is in a little better call and fairly strong at about 50c.

In a big equipment order this week, reaching a total value of $2,500,000, the Baltimore & Ohio R.R. included 2000 steel hopper cars. This road is planning to meet a collossal coal trade that all are looking forward to when business gets down to a more normal basis.

The export coal trade continues excellent. Prospects are now for shipments considerably in excess of 200,000 tons for July. This coal is going to European, African and South American ports. Last week a total of nearly 58,000 tons of cargo coal was loaded and 23,000 tons of bunker coal. Foreign vessels are bunkering more and more in Baltimore, instead of stopping at Newport News, as in the past. That new bunker contracts will be made here seems assured.

NEW YORK

Soft coal operators are following the British strike closely and some are preparing to ship. Many Italians leaving Southern fields. Anthracite trade quiet. Union officials preparing for labor trouble. Individual coals selling off.

Bituminous—The chief topic of interest among the soft coal operators and shippers is the Welsh labor situation. There are a number of dealers who believe that American shippers will have an opportunity to dispose of much of their coal to English buyers. Some local coal men are so strong in this belief that they are already making inquiries regarding bottoms. Many new inquiries for coal for export are being received from France, Italy and Spain.

There is still more than enough coal on hand to supply all needs. Many loaded vessels are tied up with no buyers in sight. Labor is getting scarce in the West Virginia and Fairmont regions it being estimated that at least 5000 Italians have departed from these sections for their native land. With the market in its present condition their absence is not particularly felt. Contracts are enabling many of the mines producing the better grades to work a little better than half time.

Local conditions do not show much change. Demand continues slow. Spot business is practically dead. Prices remain stationary. Quick buyers are able to pick up some good bargains. New York shippers are watching with much interest the labor situation in Bridgeport, fearing that should operations cease it will result in the loss of considerable business to them.

The better grades of Pennsylvania coals were quoted around $2.60 and Western Maryland at about $2.35. Current quotations are on the following basis:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.30@3.40	$3.30@3.40	$3.30@3.40	$1.75@1.85
Georges Creek Tyson	2.90@3.00	2.90@3.00		1.35@1.45
Clearfield:				
Medium	2.65@2.80	2.55@2.65		1.10@1.25
Ordinary	2.55@2.60	2.55@2.60		1.00@1.10
Broad Top Mountain				1.10@1.45
Cambria County:				
South Forks	2.90@3.05			1.35@1.50
Nanty Glo	2.75@2.80			1.20@1.25
Barnesboro	2.65@2.70			1.10@1.15
Somerset County:				
Quemahoning		2.70@2.85	2.70@2.85	1.20@1.30
Medium	2.65@2.70	2.60@2.65	2.60@2.65	1.10@1.15
Latrobe	2.45@2.55			.90@1.00
Greensburg	2.75@2.80			1.10@1.15
Westmoreland	2.95@3.20			1.15@1.40
West Virginia Fairmont ¾		2.60@2.70	2.60@2.70	.80@ .90
Fairmont mine-run		2.50@2.60	2.50@2.60	.70@ .80
Steam		2.45@2.50	2.45@2.50	.90@ .95
Western Maryland		2.35@2.40	2.35@2.40	.80@ .85

Anthracite—While strenuous efforts are being made to sell anthracite coal, the situation continues dull. In addition to the piers being over-stocked the harbor contains many loaded bottoms. The only bright spot is in the small steam sizes. Restriction in mining has affected these coals and there is a note of strength. Large consumers are making inquiries. The better grades are getting scarce, due to the less than half time operations.

The labor situation is also taking some attention from the operators. At the same time the mine owners are being brought face to face with the efforts of the Mine Workers Union to strengthen their organization before the expiration of the working agreement on Mar. 31. Daily meetings are being held throughout the mining regions which are being attended by the international officers of the organization.

Chestnut is long size of the prepared coals. Stove is the most active with egg a good second. Individual prepared coals are being quoted at from 40 to 50c. off the companies' circular. Considerable pea is being stocked. On the buckwheat coals quotations are noted at from $1.40 for No. 3 to $3 for No. 1.

Current quotations follow:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$4.85		$4.90	
Egg	5.10	$4.70@5.10	5.15	$4.75@5.15
Stove	5.10	4.70@5.10	5.15	4.75@5.15
Chestnut	5.35	5.00@5.35	5.40	5.05@5.40
Pea	3.35@3.50	2.70@2.95	3.40@3.55	2.75@3.00
Buckwheat	2.50@2.75	2.00@2.25	2.55@2.80	2.05@2.30
Rice	2.00@2.25	1.70@1.85	2.05@2.30	1.75@1.90
Barley	1.75@2.00	1.45@1.70	1.80@2.05	1.50@1.75

PHILADELPHIA

Anthracite continues very dull, with prices well off circular. Only strength lies in egg and stove, with chestnut difficult to move, and pea sold at extremely low prices. Bituminous shows no improvement locally, but tide shipments continue to hold up.

Anthracite—All agencies agree that they are not doing half the business now that they did the same time last year. One of the oldest men connected with the trade states his company has never before witnessed such conditions—extremely low prices coupled with the extraordinarily light tonnage. However, all dealers report they are receiving good orders for fall delivery.

Chestnut continues the worst size; with the storage yards filled and no market it is becoming quite a serious proposition and individual operators are taking any price. April circular for this size is common and it is known that some business has been taken at 10c. less. Egg and stove sizes are probably in better demand than the other grades, and some of the shippers claim they have good business on these sizes for shipment to the New England market. There was a report here, however, that egg was being offered in 500-ton lots at $3 10.

Pea coal continues on its erratic career. Big buyers of this size who only a few months ago gladly paid $2.25 plus the tax will not consider $2 flat now. One large dealer reports that he is buying plentifully of this size at less than $1.50, and if such is the case it is more than likely it is coal that has been protected as to price by a producer to cover fuel intended for the schools, the contract for which was recently awarded at an extremely low figure. There is no doubt that there is plenty of pea to be had at $1.50, as one colliery owner is offering this size direct at that figure.

A sales agent of one of the largest companies has instructed his force to devote the next two weeks to collecting accounts, though this is even more difficult than selling coal at this time; in fact some shippers are emphasizing their offer of long time credits. This is being featured with desirable business more than ever and even those dealers who have had the reputation of being notoriously slow pay are finding no difficulty in stocking up.

It is now becoming difficult to predict what the market will be since the unprecedented stagnation this summer will likely leave its effect. It hardly seems probable that the large storage tonnage can be absorbed even in the face of a possible strike. On the other hand there may be a stringency of coal to meet the orders when the cold weather comes, due to the fact that the steel mills in this vicinity are offering wages that are attracting labor to such an extent that when fall demand opens up it is likely to be serious.

The circular prices, to which the state tax of 2½% must be added, are as follows:

	City	Tide		City	Tide
Broken	$3.20	$4.45	Pea	$2.50	$3.25
Egg	3.45	4.70	Buckwheat	1.25	2.25
Stove	3.70	4.70	Rice	.85	1.75
Chestnut	3.85	4.95	Barley	.50	1.50

Bituminous—The trade is extremely inactive and does not seem to have recovered from the slowing down over the Fourth of July. The working time at the mines has been very much reduced accordingly. Export business is a specialty with certain companies, and whether times are brisk or dull the other concerns rarely touch it. Those companies particularly interested in the export business continue to report a good volume of trade, especially to South American countries, and Brazil in particular lately. One difficulty has been lately to secure carriers, which has of course made the rate high. With the exception of tide shipments the trade does not look for any marked improvement for a month or six weeks, and in the meantime prices continue very low, but with no likelihood that any further reductions will be made.

The ruling prices are about as follows:

Georges Creek Big Vein	$1.65@1.75	Fairmont gas, mine-run	$1.15@1.25
South Fork Miller Vein	1.50@1.60	Fairmont gas, slack	.65@ .75
Clearfield (ordinary)	1.00@1.20	Fairmont lump, ordinary	.85@ .95
Somerset (ordinary)	1.00@1.15	Fairmont mine-run	.75@ .80
West Va. Freeport	.85@ .95	Fairmont slack	.45@ .55

HAMPTON ROADS

Large shipments both foreign and coastwise. Prices firm. Indications bright for heavy movement during balance of month.

The dumpings over all piers during the week have been very heavy especially as regards export movement. Italy still receives the bulk of the export shipments although some fair sized cargoes have gone to South America ports. The demand is heavy for New River and Pocahontas run-of-mine. Some shipments of nut and slack have also been made but the demand for these as well as the high volatiles is not heavy.

English mine conditions have not as yet, so far as can be seen, caused any additional inquiries and unless the strike continues for some time it is not believed that prices at Hampton Roads will be affected.

There is little free coal at Hampton Roads at this time as practically all shippers are rushed with orders and are dumping the coal into vessels as fast as it arrives from the mines. The railroads are rushing coal forward with all possible speed and are doing everything possible to get vessels loaded as promptly as possible. There have been times during the past week when some of the larger shippers had vessels in port for over 50,000 tons of cargo with less than one-fourth of the coal on hand.

With the amount of coal already dumped and the vessel tonnage declared, the expectations are that the total tonnage for the month of July will be a million and a half or over.

Railroad Tonnages—Dumpings over the local piers for the past several weeks compare as follows:

	Week Ending				
Railroad	June 19	June 26	July 3	July 10	July 17
Norfolk & Western	207,824	213,279	211,017	174,822	180,090
Chesapeake & Ohio	71,511	79,870	83,678	76,397	116,862
Virginian	51,644	87,840	58,455	57,467	78,710
Totals	330,979	380,989	291,828	308,686	375,662

OCEAN FREIGHTS

Rates to various destinations are quotable as follows:

To	Rate	To	Rate
Havana	$2.00@2.25	Bermuda	**$3.00**
Cardenas or Sagua	**2.75@3.00**	Vera Cruz	3.50@3.75
Cienfuegos	2.75@3.25	Tampico	3.50@3.75
Port au Spain, Trinidad	**3.50@3.75**	Rio	8.40
St. Lucia	**3.50**	Santos*	8.40@8.64
St. Thomas	3.00@3.25	Montevideo	**8.22**
Barbados	**3.50@3.75**	Buenos Aires or La Plata	**8.28**
Kingston	2.75@3.00	Rosario	**8.64**
Curacao	**3.25@3.50**	West Coast of Italy	8.64@8.88
Santiago	2.50@3.00	Barcelona**	**8.16**
Guantanamo	2.50@3.00	Valparaiso or Callao	6.25@6.50
Demerara	4.25@4.50	Marseilles	**8.40**

Note—Rates noted in **bold face** type are only approximate.
* Consignees paying dockage dues. **Spanish dues for account.
W. W. Battie & Co.'s Coal Trade Freight Report.

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge. 24c. per net register ton per day demurrage."

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	Nationality	To	Tons	Rate
Glenmount	Brt.	Antilla	1246	
Laura Holdt		Paramaribo	425	$4.25
Emily F. Northam		Yarmouth, N. S.	315	1.90
Derwenthall	Brt.	Marseilles	2514	
Haniborne	Dutch	Santiago	742	
Alderney	Nor.	Havana	1970	
Tyskland	Dan.	Havana	876	
Northmount	Brt.	Antilla	1172	
Kiruna	Swd.	Sweden	2386	
Balmoral	Ital.	Mediterranean	2325	
Italian bark	Ital.	Mediterranean	2027	
Australia	Ital.	Mediterranean	1442	
Ortrud	Ital.	Mediterranean	1402	
Pacific	Am.	Havana	3394	
Verdun	Brt.	Rio Janeiro	2950	8.28
Torridon	Ital.	Savona		

BALTIMORE

Vessel	Nationality	To	Tons	Rate
Henrick[1]	Nor.	Peru[2]	2453	6.75
Kingsgate	Brt.	Buenos Ayres	2370	8.28
St. Theodore	Brt.	Genoa	3175	
Ubbergen	Dutch	Port Limon	1150	
Bendew	Brt.	Barcelona[3]	2305	
Cleanthis	Greek	Italy		
Falk	Nor.	Santa Marta		
Andrea Costa	Ital.	Leghorn		
Andriana	Greek	Campana		8.40
Andriana	Greek	Rosario		8.64
Bonair	Brt.	Spain		
Linda Hall	Brt.	Egypt		
Andyk	Hol.	Netherlands		
Socrakarta	Hol.	Egypt		
Matelot	Ital.	Italy		
Heina	Nor.	Cuba		
Mantaro	Per.	Peru		
Polvarth[1]	Brt.	Villa Constitucion[4]	1972	8.64
King Idwal[1]	Brt.	Montevideo	2306	8.16
Cloutsham	Brt.	Buenos Ayres[5]	3075	8.28
Wieringen	Dutch	Buenos Ayres[5]	1948	8.37
Panaghi Vagliano	Greek	Rosario	1878	8.37
Stylianis Bebis	Greek	Mediterranean	2216	8.40
Lady Plymouth	Brt.	Italy	2246	9.60

[1] Or Virginia. [2] Chile. [3] Or Valencia. [4] Or Campana. [5] Or La Plata.

VIRGINIA (Including Hampton Roads)

Vessel	Nationality	To	Tons	Rate
Henrik[1]	Nor.	Peru[2]	2453	6.75
Oratios Couppas	Greek	Marseilles	1846	8.46
Merak	Dutch	Rosario[3]	1877	8.64
Dionyssios Stathatos[1]	Greek	Barcelona	2296	8.64
Polvarth[1]	Brt.	Villa Constitucion[4]	1972	8.64
King Idwal[1]	Brt.	Montevideo	2306	8.16

[1] Or Baltimore. [2] Chile. [3] Three trips. [4] Or Campana.

ATLANTIC RANGE

Vessel	Nationality	To	Tons	Rate
Andriana	Greek	Villa Constitucion[1]	1867	8.40
..........[2]	Am.	Pacific Coast	5500[3]	5.25
............[2]	Am.	Pacific Coast	5500[3]	5.25

[1] Or Campana. [2] Guarantee (no vessel named yet). [3] To 8000 Tons.
Note—Steamers are indicated by **bold face type,** all others being schooners

VESSEL CLEARANCES

The following vessels have cleared from Norfolk and Newport News, July 9 to 16, inclusive:

Norfolk

Vessel	Destination	Tons
Paddington[1]	Naples	3,759
Kintail[2]	Las Palmas	5,457
Procide[1]	Genoa	5,480
Stella[3]	Callao	3,500
Tottenham[2]	St. Lucia	4,600
Haulwen	Montevideo	5,403
Mar Terse	Siracusa	4,830
Denis[4]	Para	2,750
August	Genoa	9,100
Ulysses	Canal Zone	12,000
Christoforos[1]	Naples	5,800
Purifacazione[1]	Porto Ferrajo	4,303
Westerdijk	Spezia	8,700
Dinnamare	Naples	4,600
Il Piemonte	Spezia	6,726
Mars	Buenos Aires	4,701

Norfolk

Vessel	Destination	Tons
Fairport	Genoa	6400
Swindon	Messina	6910
Polvarth	Buenos Aires	4282
Josey	Havana	5000
Merak	Rosario	4400
Tasmania	Leghorn	4700
Ada F. Brown	Rio de Janeiro	2116

Newport News (Not complete)

Vessel	Destination	Tons
Francesco Ciampa	Toranto	5300
Mariteres	Morocco	4200

[1] Pocahontas Fuel Co. [2] Castner, Curran & Bullitt. [3] Smokeless Fuel Co. [4] Chesa. & Ohio C. & C. Co.

LAKE MARKETS

PITTSBURGH

Better manufacturing demand but poorer Lake shipments, leaving mining operations at about 50%. Increased export demand expected for Connellsville. A new byproduct plant.

The industries are taking somewhat more coal, almost wholly by way of heavier specifications on contracts. The steel industry is now operating almost at its capacity, and coal consumption in that quarter is about as great as can be expected. Railroad requirements show a slight improvement. Lake shipments are decidedly less than in June, though it is not unusual for July to show some decrease. Altogether the Pittsburgh district is experiencing scarcely any better demand for coal than in the past two months, and mine operations only average about 50% of capacity. An increased demand for export coal is expected should the Welsh mines be tied up for long but this will affect the Connellsville region chiefly and will hardly reach the Pittsburgh district.

Pickands, Mather & Co., Cleveland, have joined with the United Steel Co., Canton, Ohio, to put up a blast furnace and byproduct coking plant at the latter point, and Pickands, Mather & Co. will probably furnish the coal for the plant through some of their various connections. Prices for free coal are as irregular as ever. The general basis remains quotable about as follows: Slack, 45@50c.; nut and slack, 90@95c.; nut, 95c.@$1; mine-run, $1@1.05; ¾-in., $1.10@1.15; 1¼-in., $1.20@1.25, per net ton at mine, Pittsburgh district. Even contracts to Apr. 1 could be made at substantially these figures, except of course in the case of slack.

BUFFALO

The improvement in iron creates a better feeling. Volume of bituminous larger. Anthracite still moving slow.

Bituminous—While there are some who still report no improvement they are now in the minority. There is more coal going into consumption and the export demand is growing at a good rate. This market does not profit directly by ocean shipments, but they lessen competition. All reports from the iron trade are good. Ore coming down the Lakes is in large volume and it is going out from the lower docks even faster than it is received.

If the Canadian trade would pick up a little there would be a most hopeful outlook, but it does not look as if there would be much in that trade right away. Should the war stop before long, there ought to be a general upturn of all sorts of business, both here and in Canada. Buffalo sells so much coal across the border that the dropping off there is a serious matter.

Bituminous prices are stronger except slack, which has received a hard blow from the refusal of operators to stock any this summer. It often goes at a very low price, though the best salesmen refuse to accept it. Quotations remain on the basis of $2.70 for best Pittsburgh lump, $2.55 for three-quarter, $2.45 for mine-run and $2.15 for slack, with sizes much stronger than slack.

Anthracite—The demand is so light that the trade is practically at a standstill, as compared with the average summer. However there is never anything like a large warm weather trade in this section, unless there is some sort of a scare on, such as was the case last August, when it was thought the Canadian trade might be shut off. It is believed now that the demand will be all the better late in the season on account of the general slowness now.

Shipments by Lake have fallen off but this is not expected to last. There are reports that stocks are getting too large at the upper port, but the shippers as a rule say that they have room enough yet and with a fair amount of fall buying the big Lake movement of anthracite can be kept up all the summer and fall. There is only a small local trade. Shipments by lake for the week were 105,600 tons.

CINCINNATI

Sluggishness continues in all departments, with virtually no market. However, short stocks will probably force purchasers into the market soon.

Retail dealers everywhere seem to be entirely confident of their ability to secure coal at low prices, and they are still justified in that belief by the continued sacrifices which are being made. Prices which necessarily mean a loss to the mine have been common lately, although a number of high-class concerns are holding firmly for profitable figures. Smokeless seems to be in its usual strong position, reinforced, as always, by the relatively limited supply. Splint and gas are in extremely poor demand, with no definite prospects.

CLEVELAND

Coal receipts too small to fill the demand for the first time in months. Lack of orders for prepared sizes is the cause. Coarse coal remains unchanged and the Lake trade is very light.

When the week opened only 175 cars of new coal were on track. This is about half as much as has been coming in over Sunday the last few weeks and a third of a normal Monday morning stock. Fine coal was up five cents and went to contract customers almost entirely. Large consumers called upon their dealers for more fine coal and received sufficient to take care of their immediate needs, but could furnish nothing beyond that.

So light are the three-quarter Lake shipments that fine coal is limited; this will result in hand-fired boilers using mine-run or three-quarter. There is no improvement in sight for the Lake trade and consequently there will be no increase in slack. The supply of slack has been decreasing for about two weeks and is not likely to be larger for two weeks more. Jobbers are predicting $1.75 to $1.80 for this grade by Aug. 1.

Pocahontas and other smokeless fuel operators in the southern field are refusing orders for lump and egg at current prices. They will accept all the orders they can get for mine-run at the circular or a shade under, but will not name a figure on lump and egg to anyone except old customers.

Retail dealers are not taking much coal and are not expecting to until nearer fall. It is likely there will be about six weeks of a rush in the Ohio and western Pennsylvania fields this fall. The Upper Lake docks will move coal to interior points in large quantities during the grain season, Oct. 1 to Dec. 1, and the retail demand will be large about the same time. This is the only bright spot in the future now.

Quotations for shipment are:

	Pocahontas	Youghiogheny	Bergholz	Fairmont	Ohio No. 8
Lump..........	$3.45	......	......	....	......
Lump, ¾ in.....	.....	$2.15	$1.90	$1.85@1.90	$1.85@1.90
Egg............	3.45	......	......	....	......
Mine run.......	2.65	2.05@2.10	1.80	1.80	1.75@1.85
Slack..........	......	1.60	1.50	1.55	1.50

TOLEDO

Prices stronger and movement a little better. Lake movement fair. Operators holding back production.

A better tone is noted in the local market. Prices are stronger and there is a little more buying. The threshing season is now at its height with a big crop to harvest and this has helped out the situation to some extent. The Lake movement is strengthened somewhat and it is expected that dealers will soon begin their regular fall stocking. Steam coal is quiet and improvement is anticipated shortly.

West Virginia coal still seems to have the inside track, especially in the Lake business. Kentucky coal has also experienced a fair movement at good prices. Hocking, Pomeroy and practically all the Ohio grades are slow and not very firm as to price, but there is a marked tendency on the part of operators to shut off the production rather than make large concessions. Smokeless demand continues fairly firm but there is practically none of the better grades being offered; there has been no change in prices but they are beginning to hold closer to the list.

COLUMBUS

Dealers buying more freely but the situation continues dull. Lake trade has amounted to scarcely anything and West Virginia producers are even aggressively competing for local business.

Dealers are beginning to give more earnest attention to next season's stocks, and there is a fair run of orders for July and August delivery. Few shippers are giving any guarantee in prices beyond Sept. 1. It is believed that dealers' stocks will be found short of normal when fall sets in, by reason of tardy buying during the summer, and that this will cause a material advance over present quotations.

The general state of the trade is bad. A number of operators have taken the position that the mining rate is prohibitive under prevailing industrial conditions, and will allow mines to remain idle until prospects brighten. Operators are slower than for many seasons past, except when strikes have existed. Ohio markets are being largely taken over by aggressive West Virginia competition, which has the benefit of a much lower mining rate.

Lake trade from the Hocking Valley will be practically nil this season. The largest producing company, which for several years past has averaged over 1,000,000 tons to the Northwest docks, has not shipped a single cargo, and nearly all of its mines are down. The Pomeroy district has shipped about 35,000 tons to the Lakes so far this season, which is about half of the tonnage for which it holds orders.

There is little indication of any marked revival in the steam trade. Mine-run and screenings remain at the low prices which have prevailed for some time. Consumers are depending largely on the open market. A generally hopeful view is taken of fall and winter.

Prices in Ohio fields are as follows:

	Hocking	Pomeroy	Kanawha
Rescreened lump	$1.50	$1.55	.....
Inch and a quarter	1.35	1.35	$1.30
Three-quarter inch	1.25	1.30	1.25
Nut	1.15	1.25	1.15
Mine run	1.10	1.10	1.05
Nut, pea and slack	.70	.75	.65
Coarse slack	.60	.70	.55

Mines have been working at about the following percentages of full capacity.

District	Week Ended June 26	July 3	July 10	July 17
Hocking	25	25	20	25
Jackson	20	25	15	25
Pomeroy	45	30	45	40
Crooksville	25	55	30	20

District	Week Ended June 26	July 3	July 10	Juiy 17
Cambridge	30	20	25	35
Masillon	30	15	25	30
Eastern O.	50	40	60	50
Average	32	30	31	32

LOUISVILLE, KY.

Beginning of cotton movement and improvement in general conditions creating a better tone.

The domestic stocking demand is slow appearing, especially in the interior. The almost constant rains are delaying threshing and perhaps damaging the grain. Cotton gins and cotton seed mills are soon to start in the South and a demand is beginning to develop in that section. Some steel plants are calling for Kentucky coal, but generally industrial conditions are still backward.

Prices quoted range all the way from $1.25 to $1.90 on block, and from 25 to 40 and 40 to 60c. on nut and slack, although as a matter of fact operators are selling, to a considerable extent, for what they can get. Nut and slack in the western Kentucky field is more plentiful than for a long time.

COKE

CONNELLSVILLE

Much stronger feeling, due to improvement in iron and steel markets. Appraisement of J. V. Thompson's properties. Holiday decreases production and shipments.

There has occurred a very decided stiffening in the views of coke operators as to the price furnace coke should bring, and while no sales at advanced prices have been made the whole tone of the market is clearly stronger, being helped by the further and more marked improvement in the steel industry and by the greater activity in pig iron, which has led to slightly higher prices in Bessemer and basic grades, though not in foundry iron. There are two or three inquiries out for furnace coke for delivery over various periods. The market seems to stand about as follows: Prompt furnace, $1.60; July and third quarter, $1.75; second half, $2; prompt foundry, $2@2.50; contract foundry, $2.20@2.50, per net ton at ovens.

The appraisement of the properties of Josiah V. Thompson, Uniontown, who went into receivers' hands last January, has been filed in court, showing a total value of $65,367,758. Included in the coal holdings are 58,404 acres in Greene County.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended July 10 at 340,742 tons, a decrease of 30,672 tons, and shipments at 330,073 tons, a decrease of 46,884 tons. The decreases were due to celebration of the national holiday.

Buffalo—There is much report of a stir in coke, consequent on the better state of the iron trade and this is expected to last. Some of the dealers report that they have sold a few cars at a slight advance. The larger concerns, though, generally refuse to acknowledge the advance, but say that it will come if the better demand continues. Iron ore by Lake follows the increase in the coke movement and the entire feeling is much better than it has been in a long time. Quotations are strong on the basis of $4.15 for best 72-hr. Connellsville foundry, with stock coke $3.20.

Chicago—Domestic sizes of byproduct coke are flat, and it is easy to obtain a concession of 15c. per ton from circular prices on immediate sales. Furnace and foundry sizes seem to be stronger, and the wholesalers predict higher prices shortly. Prices are as follows: Byproduct, $4.65@5.10; Connellsville, $4.75@5; Wise County, $4.75; gas coke, $3.75@4.90, furnace, $4.75.

MIDDLE WESTERN

GENERAL REVIEW

General outlook encouraging with demand quiet but prices held reasonably firm. Screenings steady. Anthracite moving slowly.

The market has been unusually quiet during the past week, and the rush of orders at the close of June seems to have been followed by calm. Shippers appear to have anticipated this situation, and production is being closely held down to the market requirements. A slight increase in domestic buying has been noticed at the higher prices.

There is little consignment coal on track in Chicago and prices on all sizes have been well maintained; in fact the market is showing such strength that as soon as there is a normal demand it will likely result in another advance in prices. Domestic consumers still show no anxiety to stock up. Retail dealers bought a small additional tonnage at the lower prices prevailing at the close of last month, they have not since made efforts to increase their commitments. The downward trend of screenings seems to have been checked, and prices on fine coal are steady.

CHICAGO

Demand generally quiet except on screenings. West Virginia grades in generally good demand. No consignment coal noted. Anthracite moving slowly but a strong demand anticipated later.

The demand for domestic sizes from southern Illinois mines has been quiet, but shipments show a fair increase as compared with the previous month. Lump and No. 1 nut have been in demand, but No. 2 nut has been heavy even at concessions. Threshing coal from Saline County has been moving briskly.

Springfield screenings have been active during the past week, the minimum price being 70c. Domestic sizes are still very slow.

Indiana contract customers are beginning to take a little more coal, so that the operators have a more hopeful outlook. Domestic lump shipments have been increased from Sullivan County mines, but they have not been so active from the Clinton district. Screenings from Clinton mines have been moving in a steady volume, while from Sullivan County they have been dragging. One or two Knox County mines are now sold up fully on contract, and are not in the open market.

Pennsylvania smokeless mine-run, lump and nut shipments are quiet, while the demand for egg has been steady. Prices on all grades of Pennsylvania smokeless in this market have strengthened over last week.

Hocking shipments have been steady at about the same ratio as last week, and country buying is quite apparent. Prices are well held and no consignment coal is on the market.

Eastern Kentucky coals are still quoted at various prices, with the buyer still in control. Slack coal has been sacrificed on demurrage. Some shipments direct from the mines have sold as high as $2 and Millers Creek block and nut have been active at fair prices, with little demand for egg.

Anthracite chestnut is moving slowly, and the demand for all other sizes is very quiet. Some shippers into this territory are trying to force business by cutting prices, but without much success. It is felt that a full tonnage at circular prices is bound to be moving not later than the month of August.

Quotations in the Chicago market are as follows:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump	$1.35@1.50	$1.25@1.35	$1.35@1.50	$1.25@1.35	$1.40@1.50
Steam lump	....	1.15@1.25	1.10@1.25	1.15@1.25	....
2½-in. lump	....	....	1.25@1.35	1.20@1.30	1.30@1.35
1¼-in. lump	....	....	1.15@1.25	1.15@1.25	....
Egg	1.35@1.50	1.25@1.35	1.10@1.25	1.05@1.15	1.15@1.25
Nut	1.25@1.50	1.15@1.25	1.00@1.10	.90@1.05	1.00@1.05
No.1washed	1.35@1.50	....	1.40@1.50	....	....
No.2washed	1.25@1.35	....	1.35@1.40	....	....
No. 1 nut	1.35@1.50	....	....	....	....
No. 2 nut	1.25@1.35	....	....	....	....
Mine-run	1.05@1.15	1.00@1.10	.85@1.00	.90@1.00	.85@1.00
Screenings	.65@ .80	.70@ .75	.65@ .75	.60@ .75	.65@ .75

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.25@1.50	$1.35@2.00	$1.90@2.00	$1.45@1.90	$1.35@1.60
1¼-in. lump	1.10@1.25	1.25@1.40	....	....	1.25@1.35
Egg	1.25@1.35	1.25@1.75	1.75@1.90	1.35@1.75	1.10@1.25
Nut	....	1.15@1.45	1.45@1.65	1.25@1.35	1.00@1.10
No. 1 nut	1.25@1.50	....	....	....	....
No. 2 nut	1.25@1.35	....	....	....	....
Mine-run	1.00@1.10	.95@1.25	1.10@1.25	1.00@1.15	.95@1.00
Screenings	.70@ .75	.60@ .80	....	....	....

Receipts by Lake—Arrivals by Lake for the week to July 19 and for the month and season to date were as follows:

Chicago

Vessel	From	Tons
J. S. Keefe	Oswego	2,262
S. N. Parent	Oswego	2,212
Francis Widlar	Erie	7,000
A. D. Davidson	Oswego	2,250
Venus	Buffalo	5,131
R. W. England	Erie	5,615
		24,470

South Chicago

Vessel	From	Tons
Frank Billings	Toledo	**8,800**
Price McKinney	Buffalo	8,100
		8,100
		8,800

Note—Tonnages noted in **full face** type are bituminous, all others being anthracite.

Totals for July and the Season

From	1915	1914
Buffalo	13,231	21,028
Buffalo		**2,600**
Oswego	6,724	4,622
Erie	12,615	6,662
Toledo	**8,800**	**8,500**
Ashtabula		7,200
Sandusky		**11,000**
	32,570	39,512
	8,800	**22,100**

Total July	91,511	83,219
	27,705	**40,671**
Total season	349,757	254,472
	191,275	**297,087**

INDIANAPOLIS

Usual midsummer dullness. Some reports of weakening in slack market. Better call for domestic lump from schools and farms. Prices generally unchanged.

About normal summer conditions prevail in the Indiana coal industry. Operators are looking forward to the long-expected improvement in the industrial demand. There is said to be signs of weakening in the screening market, but 85 to 90c. is still obtainable for best No. 4 and 75 to 80c. for others. Mine-run sells at $1.15@1.20 for No. 4 and $1.05 for Nos. 5 and 6.

There is better call for domestic lump, as country schools are now laying in supplies and the demand for threshing is now of some volume. The best prepared lump sells for $1.50 f.o.b. mines; standard grade at $1.40; egg, $1.35. The movement from retail yards to consumers' bins gets gradually larger, as the time draws nearer when there may be an advance in price. The following schedule prevails at the Indianapolis yards:

	Per Ton		Per Ton
Linton No. 4 forked	$3.00	Pocahontas forked lump	$5.50
Indiana lump, forked	2.75	Pocahontas shoveled lump	5.00
Indiana lump and egg, screened.	2.50	Pocahontas mine run	4.00
Kanawha lump, forked	4.25	Pocahontas, nut and slack	3.50
Ohio Hocking lump, forked	4.25	Anthracite chestnut	7.75
Ohio Hocking, washed egg	4.50	Anthracite stove and egg	7.50
Kentucky lump	4.50	Anthracite grate	7.25
Ohio Jackson lump, forked	5.00	Connellsville coke	6.00
Blossburg smithing	5.50	Indianapolis by-product coke (all sizes)	5.50
Cannel lump	6.00		

ST. LOUIS

Prices steadier but movement still light. Screenings softer.

There has been a bracing-up of prices on the finer grades of lump and nut during the past week, but there has not been much movement except to the Northwest, where the thresher demand is still helping out; there has also been some shipping in that direction for stocking. A surplus of Carterville screenings has forced the prices down on all grades of this size and they have been weak at 75 to 80c. while some are said to have been offered at 70.

The quotations at the end of the week were:

	Wilm. & Frnk. Co.	Sparta	Mt. Olive	Standard
6-in. lump	$1.35@1.50	$1.25	$1.35	$0.95
2-in. lump	....	.95	1.25	.85
3-in. lump	....	....	1.25	....
3x6 egg	1.35@1.50	....	....	.80
No. 1 nut	1.35@1.50	....	....	....
No. 2 nut	1.15@1.25	....	....	....
No. 1 washed	1.40	....	1.50	....
No. 2 washed	1.25	....	....	....
No. 3 washed	1.15	....	....	....
No. 4 washed	1.10	....	....	....
No. 5 washed	.80	....	....	....
Screenings	.75@ .80	.70	....	.70

PRODUCTION AND TRANSPORTATION STATISTICS

PENNSYLVANIA RAILROAD

The following is a statement of shipments over the P. R.R. Co.'s lines east of Pittsburgh and Erie for June of the current year and the six months of 1914 and 1915, in short tons:

	June		Six Months	
	1915	1914	1915	1914
Anthracite	843,053	855,247	5,423,467	5,654,277
Bituminous	3,664,703	3,897,544	20,261,777	23,555,182
Coke	990,476	793,463	4,998,919	5,227,885
Total	5,498,232	5,546,254	30,684,163	34,437,344

EXPORTS

The June coal exports by districts and states were as follows:

	Anthracite	Bituminous	Coke
Maine and New Hampshire	1,217	....	....
Maryland	298	232,866	396
Massachusetts	1	....	....
New York	18,081	3,044	628
Philadelphia	9,614	107,645	3,591
Virginia	....	445,917	5,361
Florida	45	......	....
Mobile	....	433	....
New Orleans	....	2,530	39
Arizona	....	1,124	82
El Paso	....	18,968	18,674
Laredo	....	2,202	....
Hawaii	....	10	....
Southern California	2	26	......
San Francisco	....	....	11
Washington	70	144	3,659
Buffalo	147,883	152,479	35,137
Dakota	645	1,772	157
Duluth and Superior	58	1,031	122
Michigan	......	32,430	5,168
Ohio	20,800	344,505	450
Rochester	104,649	40,634	78
St. Lawrence	117,354	16,171	973
Vermont	1,977	346	55
Total	422,694	1,404,277	74,581

Bunker Coal

Customs Districts	April	May	June
New York	267,104	266,826	273,142
Philadelphia	32,948	34,600	41,531
Maryland (Baltimore)	35,265	60,783	56,986
Virginia	120,357	172,012	146,291

FOREIGN MARKETS

GREAT BRITAIN

July 9—Welsh steam coals show general quietness without material alteration in the position. Quotations are approximately as follows:

Best Welsh steam	Nominal	Best Monmouthshires	$6.00@6.24
Best seconds	Nominal	Seconds	5.76@6.00
Seconds	$6.24@6.48	Best Cardiff smalls	4.68@4.80
Best dry coals	6.00@6.24	Cargo smalls	3.75@3.96

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—Chartering is on moderate lines with the tendency firm for the Upper Mediterranean. Rates are approximately as follows:

Gibraltar	$3.84	Naples	$5.64	St. Vincent	$4.80
Marseilles	4.83	Alexandria	6.00	Rio de Janeiro	6.72
Algiers	4.54	Port Said	5.88	Monte Video	6.48
Genoa	5.52	Las Palmas	4.65	River Plate	6.72

Exports—British exports for June and the first six months of the past three years were as follows:

	June			Six Months		
To	1913	1914	1915	1913	1914	1915
Russia	701,764	705,715	3,281	2,144,328	2,009,789	19,420
Sweden	354,149	391,533	285,693	2,098,649	1,800,093	1,628,068
Norway	157,619	152,058	202,877	1,177,903	1,247,501	1,359,295
Denmark	199,486	219,991	281,255	1,461,501	1,389,551	1,537,240
Germany	772,053	823,978	....	4,285,035	4,202,651	....
Netherlands	147,737	163,574	113,171	1,027,081	872,526	762,209
Belgium	135,467	140,565	......	1,071,562	880,366	......
France	1,062,395	965,326	1,546,559	6,419,070	6,818,125	8,460,758
Portugal[1]	126,652	102,929	86,512	718,408	650,349	533,452
Spain[4]	290,000	253,377	152,248	1,910,152	1,756,681	1,046,031
Italy	777,463	632,393	399,353	4,708,188	4,533,077	3,068,374
Aus. Hung.	33,732	83,892	......	574,384	462,164	......
Greece	54,749	66,664	32,446	323,058	374,132	219,489
Roumania	20,507	25,514	......	70,144	156,720	......
Turkey	14,118	60,116	......	71,797	309,307	6,557
Algeria	92,552	75,139	70,481	671,401	610,528	525,495
Portuguese[5]	15,590	9,258	10,716	139,131	97,993	112,784
Chile	70,954	34,035	13,297	364,772	302,205	35,430
Brazil	170,564	135,821	32,040	1,021,774	727,128	341,270
Uruguay	60,911	66,334	19,865	359,679	390,608	204,092
Argentine	297,715	210,369	74,970	1,807,301	1,825,940	958,072
Channel Is.	8,672	10,036	7,590	70,591	76,853	61,117
Gibraltar	19,406	14,526	32,218	187,767	170,629	190,066
Malta	35,300	35,129	28,805	376,501	242,657	86,276
Egypt[2]	209,995	211,818	65,864	1,513,311	1,636,842	685,696
Aden[3]	12,639	5,708	28,777	72,835	85,569	89,179
India	14,582	12,800	50	105,569	110,802	12,160
Ceylon	29,153	26,096	469	127,688	172,695	31,990
Miscell'ous.	120,486	99,526	68,769	646,655	673,457	357,970
Coke	75,336	73,163	52,713	499,670	517,609	419,709
Briquettes	185,162	192,034	115,404	1,022,232	1,044,360	624,875
Total	6,266,908	5,999,417	3,725,423	37,048,137	36,148,907	23,377,174
Bunker	1,721,016	1,681,477	1,065,779	10,087,037	10,182,157	7,400,321

[1] Includes Azores and Madeira. [2] Including Anglo-Egyptian Sudan. [3] And dependencies. [4] And Canaries. [5] West Africa.

Note—The figures in the above table do not include Admiralty and certain other shipments.

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

For the official advertisements of bids wanted see the Contracts-to-Be-Let Section on Page 12.

+Indicates contracts regarding which official information has been received.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

No. 726—New York, N. Y.—Bids on this contract (Vol. 8, p. 76) calling for 2350 gross tons of egg or stove coals for fireboats, divided into three items, were opened on July 19, as follows: Item 1—1150 tons for fireboats in North River, at foot of Bloomfield St. and West 35th St.; John F. Schmadeke, $5.95 per ton, total, $6842.50; William Farrell & Son, $5.93 per ton, total, $6819.50. Item 2—600 tons for fireboat and launch berthed at the Battery. John F. Schmadeke, $5.95, total, $3570; William Farrell & Son, $5.93, total, $3558; Bacon Coal Co., $5.86, total, $3510. Item 3—600 tons for fireboats berthed at the foot of 38th St., Brooklyn, and St. George, Staten Island. Commercial Coal Co., $6.18 per ton, total, $3708. Address Fire Commissioner Robert Adamson, Municipal Building, New York City.

No. 922—New Orleans, La.—Bids on this contract (Vol. 7, p. 1127), which provides for furnishing the local School Board with approximately 2000 tons of anthracite and bituminous coal, will be received until July 26. Address Secy. E. A. Williams, Bd. of Edu., 4th floor, Municipal Bldg., New Orleans, La.

1019—Allentown, Penn.—Bids on this contract (p. 77), which provides for furnishing the Whitehall Township school district with chestnut and stove coal, were as follows: Balliet Bros. & Co., $6.25; R. E. Grammer, $6.25. The board has as yet taken no action on the matter, as additional bids are anticipated shortly. Address Secy. A. N. Kuhns, Orefield, Penn.

1054—Ottumwa, Iowa—Bids on this contract (p. 116), which provides for furnishing local School Board with approximately 1600 tons of screened lump coal, will be received until 6 p.m., Aug. 9. Bids are to include cost of delivery in the coal cellars. Address Secy. J. A. Wagner, Bd. of Edu., Ottumwa, Iowa.

New Business

1096—Kansas City, Mo.—Montgomery Ward & Co. will let a contract for the year's supply of coal for the Kansas City branch about Aug. 1. It uses about 6000 tons of Cherokee mill. Address Purchasing Agent, Montgomery Ward & Co. Kansas City, Mo.

1097—Norwalk, Conn.—The Board of Education at this place will contract some time in August for about 100 tons of anthracite and bituminous coal. The call for bids is advertised. Address Board of Education, Norwalk, Conn.

1098—Huntingdon, Penn.—The Board of Education at this place will receive bids until Aug. 1 for furnishing 250 tons of the best Broad Top coal, bids to include cost of delivery in the cellars of the school buildings as designated. All the coal is to be delivered during the month of August. Address Secy. H. H. Waite, Bd. of Edu., Huntingdon, Penn.

+1099—Jefferson City, Mo.—The State Commissioners will receive sealed bids until 10 a.m., July 26, for furnishing the coal supply to the various state departments for the fiscal year beginning Oct. 1. Address Secy. Cornelius Rouch, Com. of Permanent Seat of Government, Jefferson City, Mo.

+1100—Columbia, Mo.—Sealed proposals for furnishing approximately 14,000 tons of coal during the year commencing Sept. 1, 1915, will be received by the Curators of the University of Missouri until noon, July 28. Address Bus. Mgr. Edward E. Brown, University of Missouri, Columbia, Mo.

+1101—Urbana, Ohio—The County Commissioners will receive sealed bids until noon, July 26, for furnishing 100 tons of anthracite and 50 tons of Jackson No. 2 or Virginia splint coal. Bids should include cost of delivery in the coal bins at the Court House in carload lots as ordered. Address County Audr. O. E. Eby, Bd. of Comrs., Urbana, Ohio.

+1102—Beaver Falls, Penn.—The School Directors of North Sewickley Township will receive bids until 1:30 p.m., July 31, for furnishing the coal requirements at the nine school buildings of the district during the ensuing year. Address Secy. S. O. Swick, Beaver Falls, Penn.

+1103—Wahjamega, Mich.—Sealed bids will be received until 10 a.m., Aug. 6, for furnishing the Michigan Farm Colony for Epileptics with approximately 80 tons of coal per month during the ensuing year; also about 100 tons of anthracite, stove and egg will be required. Address Steward C. W. Gage, Farm Colony, Wahjamega, Mich.

+1104—Springdale, W. Va.—The local school board will receive bids until 6 p.m., Aug. 3, for furnishing 4000 bu. of mine-run coal to be delivered into the basement of the local school house. Address Secy. W. A. Clowes, Jr., Springdale Borough School Board, Springdale, Penn.

+1105—Pierre, S. D.—The Board of Education at this place will receive sealed bids until 8 p.m., July 30, for furnishing 350 tons of Youghiogheny and Pocahontas mine-run coal; 275 tons are to be delivered on or before Sept. 1 and the balance as directed during the month of January. Address Clk. Tom C. McNamee, Bd. of Edu., Pierre, S. D.

+1106—Pennsburgh, Penn.—The Board of Education will receive sealed bids until 6 p.m., July 24, for furnishing and delivering stove coal to the various school buildings during the ensuing year. Bids will also be received separately for both furnishing and delivering the coal. Address Harvey C. Jones, Bd. of Edu., Pennsburg, Penn.

1107—Kansas City, Mo.—The Densmore Hotel will let it contract for about 300 tons of slack during the month of August. Address Purchasing Agent, Densmore Hotel, 912 Locust St., Kansas City, Mo.

+1108—Sharpsville, Penn.—The School Board at this place will receive bids until 7 p.m., July 30, for furnishing from 150 to 200 tons of coal to be delivered at the school building. The best grade of three-quarter screened Pittsburgh coal is required. Address Secy. H. B. Wert, School Bd., Sharpsville, Penn.

+1109—Grenada, Miss.—The local Water and Light Department usually contracts in August for their annual fuel requirements involving about 3000 tons of nut and slack coal. The customary price is $2.50 per ton. Address Supt. S. L. Alward, Light & Water Dept., Grenada, Miss.

+1110—New Bethlehem, Penn.—The School Board at this place will receive bids until July 31 for furnishing mine-run coal to the local schools during the coming season. Address Secy. C. E. Sheffer, New Bethlehem, Penn.

+1111—St. Joseph, Mo.—The Board of Education usually contracts some time in August for their fuel requirements which aggregate about 4000 tons. Standard bituminous lump coal is ordinarily used and the current contract is being filled at $3.17 per ton. The business is let on competitive bids, and a bond for $2500 guaranteeing the satisfactory performance of the contract is required. The business is not advertised, specifications being mailed to all dealers. Address Supply Committee, Board of Education, St. Joseph, Mo.

+1112—Natrona, Penn.—The Harrison Township School Board received sealed bids until July 19 for furnishing coal required at the local schools during the term beginning Aug. 30. Address Secy. Percy M. Kennedy, 76 Vine St., Natrona, Penn.

+1113—Shippensburg, Penn.—The Local School Board is requesting sealed bids for furnishing 100 gross tons of bituminous coal, deliveries to be completed by the last of August. All bids must be in by July 26. Address Secy. C. E. Warren, Shippensburg School Dist., Shippensburg, Penn.

+1114—Hazlehurst, Miss.—The City Water & Light Plant at this place usually contracts some time in August for their annual requirements of coal which amount to about 90 tons of No. 2 lump per month. The business is done on competitive bids, and the usual price is about $1.02 per ton f.o.b. mine. Address Supt. M. L. Slay, City Water & Light Plant, Hazlehurst, Miss.

+1115—Roscoe, Penn.—The local School Board at this place received sealed bids until July 20 for furnishing 1800 bu. of coal to be delivered at the school buildings. Address Secy. John Lee, Roscoe School Bd., Roscoe, Penn.

+1116—Windsor, Mo.—The Board of Education at this place is inviting bids from coal operators until Aug. 5 for furnishing the winter supply of fuel. Address Secy. J. W. McIntire, Bd. of Edu., Windsor, Mo.

+1117—Rockville, Ind.—The local School Board will receive bids until July 24 for furnishing approximately 5000 tons of coal. Address Secy. O. M. Teague, Bd. of Edu., Rockville, Ind.

+1118—Connellsville, Penn.—Sealed bids will be received until 2 p.m., July 31, for furnishing the various schools of Perry Township with coal during the ensuing year. Address Secy. J. R. Martin, Bd. of Edu., Perry Township, Connellsville, Penn.

+1119—Lansing, Mich.—The Industrial School at this place will receive bids until noon, July 29, for furnishing approximately 3000 tons of coal to be delivered in the coal sheds as may be required. Bids are requested on three-quarter steam lump, mine-run and screened coal, and bidders must name the state where the coal is mined. Address Supt. E. M. Lawson, The Industrial School, Lansing, Mich.

+1120—New Orleans, La.—The Board of Education will receive sealed bids until noon, July 26, for furnishing the public schools with coal as required during the coming school year. Specifications may be obtained on application. Address Secy. E. A. Williams, Bd. of Edu., Municipal Bldg., Carondelet and Lafayette St., New Orleans, La.

+1121—Springfield, Ill.—The Illinois State Board of Administration received bids until July 15 for furnishing the various State charitable institutions with approximately 173,400 tons of coal. Illinois coal will be used exclusively with the exception of about 5000 tons of Pocahontas. The coal is to be delivered at 18 plants in 15 different cities and towns. The requirements are as follows: Lump, 1000 tons; mine-run, 42,000 tons; 2-in. screenings, 12,000 tons; 1¼-in. screenings, 114,000 tons; slack, 4000 tons; rescreened nut, 460 tons; Pocahontas mine-run, 500 tons. Payment will be made on a heat basis. Address The Illinois State Board of Administration, Springfield, Ill.

+1122—West New York, N. J.—The Board of Education at this place will receive bids until 8 p.m., July 26, for furnishing 400 tons of pea coal and 200 tons of nut. Address Board of Education, West New York, N. J.

+1123—Indianapolis, Ind.—The Board of Trustees for the Indiana State School of Deaf will receive sealed bids until 10 a.m., Aug. 15, for furnishing approximately 4000 tons of 1¼-in. standard screenings or washed coal, and about 40 tons of nut. The latter tonnage is to be delivered by wagon, and on the former, quotations should be f.o.b. switch at the powerhouse door. A certified check for $500 must be filed with all proposals. Address Secy. Richard O. Johnson, Bd. of Trustees, Indiana State School of Deaf, 42nd St. and Monon R.R., Indianapolis, Ind.

+1124—Ipswich, Mass.—The Board of Education at this place will receive bids until Aug. 2 for furnishing 100 tons of anthracite furnace coal and 200 tons of bituminous. Address Superintendent Ipswich School Board, Room 9, Town Hall, Ipswich, Mass.

+1125—Columbus, Ohio—The Director of Public Safety will receive sealed bids until noon, July 29, for furnishing and delivering 1250 tons of the best quality lump coal to the city prison, workhouse, and various engine houses as may be required. All bids must be accompanied by a bond in the sum of $318.70. Address Dir. of Pub. Safety, B. L. Bargar, City Hall, Columbus, Ohio.

+1126—Hattiesburg, Miss.—The School Board at this place received sealed bids until July 23, for furnishing approximately 200 tons of high-grade coal. Address Supt. F. B. Woodley, 417 Walnut St., Hattiesburg, Miss.

+1127—Indianapolis, Ind.—The School Board at this place will receive sealed proposals until 8 p.m., July 27, for furnishing its fuel requirements during the year ending July 31, 1916. All bids must be made according to specifications and on blanks, which can be obtained on application. A deposit of $500, guaranteeing the satisfactory performance of the contract, will be required. Address Business Dir. John F. Cleland, Bd. of Edu., Indianapolis, Ind.

+1128—North Bergen, N. J.—The Board of Education at this place will receive bids until 8 p.m., July 28, for furnishing the local schools with approximately 600 tons of nut coal during the ensuing year. Address Board of Education, North Bergen, N. J.

1129—West Norfolk, Va.—The Virginia Smelting Co. at this place is in the market for 2000 to 2500 tons of anthracite buckwheat No. 3. Shipments are to begin Oct. 1 and deliveries to be made in 1000-ton cargoes. Address Purchasing Agent, The Virginia Smelting Co., West Norfolk, Va.

+1130—Bremen, Ohio—The School Board at this place will receive sealed bids until 7 p.m., July 24, for furnishing and delivering 200 bu. of screened lump coal to the schools in Rushcreek Township. Two hundred bushels will be required in each district. Deliveries are to be completed by Sept. 1. Address Clk. J. W. McCullough, Bd. of Edu., Bremen, Ohio.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

+No. 616—San Francisco, Calif.—This contract (Vol. 7, p. 795), which provides for furnishing the lighthouse inspector at this place with coal, has been awarded to the **Western Fuel Co.** at $10.55 per ton for Wellington coal in sacks and $7.35 per ton in bulk. Address Lighthouse Inspector H. W. Rhodes, 18th Lighthouse District, San Francisco, Calif.

No. 745—Houston, Tex.—This contract (Vol. 7, p. 917), which provides for furnishing the local Board of Education with coal, was awarded to **Rice & Coles** at $4.50 per ton for Peerless screened lump coal. Richard Cocks & Co. bid $4.64 for Illinois coal, and Sampson & Bearden $4.50 for the same grade. Address W. Peirce, Public School Board, Houston, Tex.

No. 795—Cullman, Ala.—This contract (Vol. 7, p. 1005), which provides for furnishing the local Light and Water Plant with approximately 2400 tons of washed nut coal, has been awarded to the **Blocton-Cahaba Coal Co.** at $1.50 per ton. Address Supt. B. Kiel, Light and Water Plant, Cullman, Ala.

+No. 855—Wilmington, N. C.—This contract (Vol. 7, p. 1085, Vol. 8, p. 76), which provides for furnishing the U. S. Engineers at this place with 13,000 tons of bituminous coal, has been awarded to the **Logan Coal & Supply Co.**, Jacksonville, Fla., the gross consideration being $17,680. Address Maj. H. W. Stickle, Corps of Engrs., U. S. Engineers' Office, Wilmington, N. C.

No. 856—Kansas City, Mo.—This contract (Vol. 7, p. 1085, Vol. 8, p. 40), which provides for furnishing the local Board of Education with approximately 7000 tons of coal, has been awarded to the **Sweeney Coal Co.** on semianthracite lump at $20\frac{4}{5}$c. per bu., and the **J. T. Wellington Co.** on deep shaft Cherokee lump at $14^4/_{25}$c. per bu. Address Pur. Agt. F. S. Casey, Bd. of Edu., Kansas City, Mo.

+No. 904—Uniontown, Penn.—This contract (Vol. 7, p. 1087), which provides for furnishing the local Board of Education with its coal and coke requirements, has been awarded to **John A. Whyel & Son,** at $7 per ton for mine-run coal and $3 per ton for soft coke. E. C. Rich bid $6.90 per ton for mine-run and $3.50 per ton for soft coke. Address C. L. Davidson, Schools District of Uniontown Borough, Uniontown, Penn.

No. 911—Cherokee, Iowa—This contract (Vol. 7, p. 1126), which provides for furnishing the local Board of Education with approximately 300 tons of coal, has been awarded to **Schoenmier Bros Co.**, on La Salle lump coal at $4.50 per ton. Address Secy. William Shardlow, Independent School District of Cherokee, Cherokee, Iowa.

+No. 921—Rensselaer, Ind.—This contract (Vol. 7, p. 1127), which provides for furnishing Jasper County with approximately 400 tons of coal, has been awarded to the **Power Coal Co.**, of Chicago. Address Audr. J. P. Hammond, County Comr. Rensselaer, Ind.

No. 922—Rock Island, Ill.—This contract (p. 76), which provides for furnishing the Standard Oil-Cloth Co. with two cars of screenings per month has again been renewed. No details are available. Address Standard Oil-Cloth Co., Rock Island, Ill.

+No. 928—Quincy, Ill.—This contract (Vol. 7, p. 1127), which provides for furnishing the local Water Department, its annual requirements of coal, has been let to the **Wabash Coal Co.** at $3 per ton for 3-in. screened lump coal. The cost is to include whatever expense the dealer may be put to in weighing the coal on the city scales. This price compares with $2.84 per ton of 4-in. screened lump coal on the contract for the past year. Address, Business Mgr., Clyde L. Sears, Bd. of Edu., Quincy, Ill.

COAL AGE

Vol. 8 NEW YORK, JULY 31, 1915 No. 5

A Touch of Velvet

IT WAS well for our friend the mule at this plant that a humane manager put on his thinking cap and evolved the idea that a mule pushed so hard must of necessity slow down in the late hours of the day when coal was "coming good," thereby "tying up" an entry, superheating the driver's language and overworking his whip arm.

> "Push that mule to the limit; what kills one buys another."
>
> In years past, an order that I frequently heard at a certain mine was: "Push that mule to the limit; what kills one buys another."
>
> At this particular plant one could also hear a driver described in admiring tones as "a great coal hauler." "Why, that fellow kills just about one mule a year—just drives them to death."

We have frequent demonstrations of the fact that a high degree of efficiency is not possible without a feeling among the men of personal interest, and with it, as a natural consequence, personal initiative. In the production of coal this is doubly important, for in each mine there are employed the requisite number of men to take care of the production, based on past records.

To enter into details a little: In each mine we have a certain number of working places that will produce with the necessary equipment and day-labor expense an estimated amount of coal. This may work out all right and come up to expectations. A driver under this system will take care of his stipulated number of rooms and entries and give each loader a fairly good turn per day. Yet if we can add a little personal interest or enthusiasm, it acts like the touch of a magic wand.

The driver no longer borrows the "makins" and "rolls a nail," or sits on the gob while the loader tops off a car. Spurred on by the possibility of reward, by rivalry, or by the hope of establishing some new record, or whatever the incentive may be, he hustles in and out; he "rolls a nail" while waiting for the motor at the passway if someone isn't quite loaded; he helps throw on a few lumps and urges the miner to be ready for the next trip.

Each industry must have its own special way of developing efficiency and applying the improved methods to its own particular case. What would apply to the mining business might not be suitable for other lines of work. But where the day-labor expense is a large factor in the total cost per ton—and this outlay is governed entirely by the number of tons handled per man per day—this incentive to hustle will cause an addition to the tonnage that is pure velvet. There is a marked difference in being made to do a thing and in doing it from a sense of duty and performing the same work of one's own volition.

In planning for production some theories of efficiency are based on system. The work to be accomplished by each employee is based on the average of such accomplishments in the past. To increase this amount without any further expense, there must be some unusual motive, some definite reward that is obtainable. One factor that has an important bearing is to impress upon each employee a sense of responsibility, in order that he will experience pleasure if successful, and disappointment if unsuccessful.

Some corporations or their officials have a propensity for importing men to fill positions of importance. They apparently are possessed with the idea that the most capable men live elsewhere. They never consider that home talent, if properly trained, will exhibit qualities necessary to a successful career. There are few industries that have not on their payrolls men capable of great deeds if started in the right way and with the proper incentive. One means of developing this tendency is to employ a definite system in managing the organization.

Each company official should keep careful watch over the men under him; when a desirable position is vacant, let him give someone a chance who has been faithful and diligent. It should be the purpose of all officials to encourage application and stability, to have each employee feel that with his company there is an opportunity, and that the opportunity is contingent upon competency and the faithful performance of duty. This tends to strengthen the fundamental scheme of the organization; it creates enthusiasm, initiative and competency, which in turn mean efficiency and success.

Written by C. P. SHOCKLEY

When Opportunity Knocked

By Edgar White*

SYNOPSIS—The story of two young men, showing how one succeeded and the other failed.

When Opportunity knocks she does not expect that everybody will hearken. It is a safe guess that not one in a thousand recognizes the call. But everyone in the thousand has the chance. In the year 1860 Opportunity knocked at the doors of two strong-limbed, healthy young men of 19. Neither had an advantage over the other in wordly goods. Both were pitifully poor.

Alexander Rector was awarded the contract to dig a 25-ft. well for Wilburn Hughes, a farmer living near the then obscure village of Bevier, Mo. He was to get 45c. a day and board. He thought he was doing uncommonly well. Farmhands were glad to get $10 a month and a place to stay. Alex sang as he toiled, and his well went down day by day. At 12 ft. he ceased singing; his pick encountered slate. Two feet further he struck coal—"black rock," he called it. A drill showed there was 6 ft. of this. He regarded it as an abomination because it would ruin the water unless the well were cased, and even then the stuff might work through. He suggested digging a well in another place, and this time he was not bothered with coal.

The coal discovery didn't excite any particular interest. It gave Rector, who got a job to dig another well, no concern whatever. There was plenty of wood in the forests. Locomotives and steamboats were fueling with cottonwood.

A Macon, Mo., paper printed a brief story of the well-digger's find. By chance a copy of the little weekly got over into Illinois. It fell into the hands of Thomas Wardell, a young Englishman but recently come to America. Wardell was at Kewanee, not waiting for something to turn up, but looking over the field to turn something up. His sole capital was youth, brain and muscle. The next train took him to Missouri. In a week he had satisfied himself of the vast extent of the coal lands and the quality of the product. The farmers about Bevier gladly signed option contracts for anything between the surface of their holdings and China. All they reserved in the bond was a crust thick enough to raise a crop on. Their royalty was a fourth of a cent a bushel. They figured they couldn't possibly lose anything at that, as they burned wood and had no earthly use for coal.

A Proposal to a Railroad President

When Wardell had spiked down enough options to insure the carrying out of heavy contracts he presented himself to the president of the railroad at St. Louis. He told what he had to offer and what he wanted for it.

The president looked at the young man and said:

"Want us to change all our engines so as to give you a job, eh?"

"That is the principal motive with me," he said. "But of course I knew when I came to you that you wouldn't do it unless I could prove that I could deliver all the coal you might need, and that it would be cheaper."

"And you are prepared to show me that?" asked the official.

"I am," replied the young Englishman.

He then produced his maps, showed the depth of the coal and where it lay. His prospect holes determined the character of the material beyond the shadow of doubt, and he brought with him specimens. Having finished the examination, the president was called to look after other business.

"Come around this afternoon," he said, "and I'll talk with you about this business a little further. Where are you stopping?"

Wardell mentioned a cheap tavern near the levee.

"What!" exclaimed the railroad man. "You come down here to negotiate a fifty-thousand-dollar deal and stop at a fifty-cent-a-day house?"

"Exactly so," replied the young man. "I just had barely enough money to make the trip."

"Then how on earth do you expect to handle such a big contract?"

"You sign it and I'll handle it all right."

"You haven't a sign of security in case you fail?"

"I'll assign my coal options to you. You can't lose."

The lad's courageous, self-reliant demeanor won. A banker had agreed to back him as soon as he demonstrated he could sell the coal. He went home with a contract to furnish a certain number of tons of coal per month to the Hannibal and St. Joe engines, and by the time the road was ready for it Wardell had his tipple, engine house and loading chutes waiting.

Made Several Million Dollars

The history of the wonderful coal development of Macon County is practically a biography of Thomas Wardell, the English lad who began operations without a dollar. He died in 1887 the controller of the greatest mining district in the West, and worth over five million dollars. He established schools, fostered churches and built hundreds of comfortable homes for the miners. His own lordly estate, in the suburbs of Macon, was easily worth a million dollars, and his son's home there, built since the great operator's death, comprises the finest residence and park in northern Missouri. The young man has let go of the coal possessions that made his father, and the purchasers, value them at $4,000,000. The normal annual output of the 25 mines is over a million tons.

Alex Rector, the discoverer, abandoned well-digging and went to mining. He became an expert miner and could easily make from $3.50 to $4 each working day. This made well-digging look contemptible by comparison, and he never resumed his earlier occupation. Through all the years of Wardell's big dealings Rector plied his pick and "shot down" his coal, but he never felt the call to control. He was a good miner and a good man. Rector died a while back, full of years and worth about as much as when his pick struck coal—and spoiled his well.

"If it was to do over again," he remarked a few years before his death, "I expect I would act just the same. Responsibility always fretted me. I haven't anything laid by and I haven't had anything to worry me."

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*Macon, Mo.

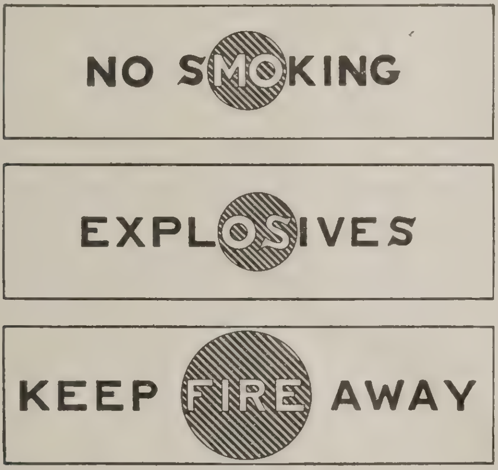
Fire Prevention at Coal Mines

By H. S. Mikesell*

SYNOPSIS—A résumé of the precautions taken to prevent fire and the rules of action to be observed in case of one, as adopted by three coal companies in the Middle West. Three precautionary fire signs are employed. Fire-fighting apparatus must be tested periodically and reports of such tests made to the main office.

Apropos of the foreword in the issue of *Coal Age* of Mar. 27 headed "Do You Appreciate the Importance of Effective Fire Prevention?" the publication of rules to be followed for the prevention of fires at the mines of the Rock Island Coal Mining Co., the Consolidated Indiana Coal Co. and the Coal Valley Mining Co., issued under the direction of President Carl Scholz, may possibly be of interest.

Constant vigilance and cleanliness are the best preventives of fires at mining plants. Standing instructions are in effect at these mines that all officers and employees must give personal attention to the protection of the company's property from fire, and the officer or employee who fails to do this does not perform his full duty, even though the property concerned may not be directly where he is employed or working. The rules and regulations covering surface plants follow:



PRECAUTIONARY FIRE SIGNS NOS. 1, 2 AND 3

STORAGE AND USE OF EXPLOSIVES, OILS, ETC.

1. Oil for company's use in shops and warehouses, except where a small quantity is kept on hand, should be kept outside of main buildings. Wherever it is practicable to do so, arrangements should be made to keep it in a building designed for the purpose; in all cases a metal lined box with a sand base shall be provided on which to clean and fill lamps and keep oil cans.

2. Explosives should not be used or stored except under prescribed conditions.

3. The use of benzine, gasoline or naphtha for mechanical purposes in any building will not be permitted, except in cases where the written approval of the general manager and insurance department, both as to quantity and purpose, has been obtained. When used, it should be only in restricted quantities, by daylight only, and from approved safety cans. Where gasoline power is used, special care should be given to oil pumps to see that oil is not leaking.

4. Supplies of benzine, gasoline or naphtha must be kept only in structures especially provided for the storage of those fluids.

LIGHTING AND HEATING

5. Gas and lamp fixtures must be rigid. Burners must be protected by wire guards or globes so that heat or flame cannot reach woodwork or other inflammable material. Woodwork above or alongside gas jets or lamps must be protected with asbestos board and tin.

6. Kerosene oil lamps with glass fonts are objectionable. Lamps with metal fonts must be used.

7. Paper or pasteboard shades must not be used on any light globe. Metal or porcelain should be used.

8. Place wire guards on all electric-light globes used in record rooms and see that lamp cords are short enough so that lights cannot be placed inside pigeonholes or on shelves.

9. The use of torches is attended with danger, and every precaution should be exercised when they are used, both as to handling and storing. They must be kept in metal receptacles when not in use and not in wooden closets.

10. The use of open lights in powder houses, oil houses, paint houses, etc., and where inflammable vapors or dust are present is prohibited.

11. The use of gasoline stoves for cooking or heating purposes or of gasoline for lighting in warehouses and other buildings is prohibited unless by consent of the general manager.

12. Furnaces, stoves, pipes, flues and chimneys must be thoroughly examined by the employees in charge as often as necessary for defects which might entail risk of fire. These defects must be speedily remedied.

13. Portable furnaces using petroleum oils should be removed from buildings when not in actual operation. See that all oil is turned off at main supply tank at night on all oil systems.

14. Pails of fine dry sand should be maintained at all places where oil and grease are stored.

15. Furnaces and stoves for heating buildings must be securely set on stone, concrete, cemented brick or metal. Woodwork near furnaces and stoves or stovepipes must be protected by sheet metal and air spaces must be provided where stovepipes pass through woodwork. Stovepipes must not pass through concealed places, such as an attic, or enter a flue in concealed places. The stovepipe inside of a building must be in plain view. Where stovepipes pass through record and file rooms, care shall be taken to see that papers are kept sufficiently far away from them and that a metal guard or screen is provided to prevent contact.

POWER

16. Steam pipes must rest on metal supports and not be placed too close to woodwork. They should be kept free from greasy or oily waste and other inflammable material. Clothing must not be hung on or near steam pipes.

17. Dust must not be allowed to accumulate on top of boilers, and tops of boilers must not be used for drying combustible materials.

18. Dynamos, motors and electric-light wiring in buildings must be properly insulated and equipped with safety devices. Wiring should be overhauled and inspected regularly and kept up to standard, especially in buildings where the wiring is not of recent installation. All telephone wires before entering buildings of the company should be protected by lightning arresters, and in cases where they are liable to come in contact with high potential wires, by excessive current protectors. No person should be allowed to make alterations or repairs of any kind to electrical equipment or apparatus except upon the authorization of the general superintendent. Wiring of all kinds must be installed and maintained according to the rules of the National Electric Code.

19. Smoking is prohibited in powder houses, magazines, stable buildings, shops, storehouses and warehouses and at all points where inflammable materials are handled. Lighted cigarettes, pipes and cigars must not be brought inside of buildings. Signs to that effect should be posted conspicuously.

20. Greasy and oily waste must be kept in approved metal cans, with self-closing covers. Waste cans must be emptied at the close of each day's work, as the combination of oil and waste or rags under certain conditions will cause fire by spontaneous combustion.

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*139 West Van Buren St., Chicago, Ill.

21. Sawdust must not be used in spittoons; sand must be used. Wooden spittoons are prohibited.

22. The use of matches in and around buildings should be avoided as much as possible; but when they are necessary, safety matches should be provided and care should be taken to see that they are extinguished after being used. When kept in stock, metal boxes should be provided for them.

23. Dirt, rubbish and inflammable material must not be allowed to accumulate in or about tipples, shops, warehouses, buildings or premises of the company. Attic space must not be used for storage purposes.

24. Oil lamps must not be filled after dark or near a fire, and where such work is done care should be taken to keep the surroundings free of oil saturation by having metal-covered stands provided on which to do that work.

25. Ashes must be handled in metal utensils and be removed every day. Ashes must not be kept in wooden boxes nor thrown against sides of buildings or platforms.

26. The use of unventilated wooden closets for men's clothes and supplies is not approved. Well-ventilated metal closets or lockers (to be kept away from wood structural material) are recommended for workmen's clothing and tools.

27. All dry grass, weeds, etc., must be removed if near wooden structures.

28. Fire barrels must be kept filled, and salt or calcium chloride be added to the water in them where it is likely to freeze. Fire hose, fire plugs and other fire appliances must be tested and kept in good condition, fire brigades be organized and drilled at least monthly and employees be instructed as to the use and method of handling fire extinguishers. A good supply of barrels and fire pails should be provided for all shops, warehouses and tipples.

29. General superintendents will appoint at each mine a responsible employee to act as fire chief. The fire chief will be in direct charge of the fire brigade and will be held responsible for the efficient condition of all fire-fighting apparatus on the premises. He will inspect all property thoroughly and regularly to see that premises are kept clean and free from any features which might cause fire. He will further complete and submit to the general offices once every 10 days a report of practice run of fire brigade on form 2617.

30. Where there are locked fire-alarm boxes near or in shops, warehouses and other buildings, the key must be procured and hung up in a conspicuous and accessible place. Fire-alarm boxes or wires should not be attached to buildings.

31. General superintendents will post warning signboards in conspicuous places on powder houses, magazines and stable buildings and on such other buildings where signs are necessary. On powder houses and magazines, use signboards Nos. 2 and 3, as shown on p. 161. At entrance to gaseous mine or district, use signboards Nos. 1 and 3, as shown. On and in stable buildings, use signboards Nos. 1 and 3, as shown. Wherever smoking is prohibited, use signboard No. 1. On and in oil houses, shop buildings and storehouses, use signboards Nos. 1 and 3. These signboards may be made of wood alone, wood covered with sheet tin, iron or copper, or of solid sheet copper, or of steel. The background must be painted white. Lettering must be in black, except lettering in center of red symbol, which must be white. (See illustration.) The center symbol must be bright red. Signboards must be 4 ft. 6 in. long and 16 in. wide. Lettering must be 3 in. in height.

REPORTS TO BE FURNISHED PERIODICALLY

1. Regular monthly reports are rendered the general office showing progress made in carrying out the recommendations of the Insurance Department for improved fire protection, which are made by inspectors at intervals, showing by item and survey numbers the status of each recommendation.

2. General superintendents forward to the general office once each month form CT-117 showing corrections to be made in the insurance schedule.

3. Fire brigade chiefs submit to the general office once every 10 days a report of practice run of fire brigade on form 2617.

4. Requisitions are made promptly on the purchasing department for supplies necessary to carry out instructions contained in the rules and regulations for the prevention of fires.

At each group of mines a fire-fighting force is organized with a brigade established at each mine. Fire drills are run at intervals so that all employees both inside and outside of the mine know their respective places of duty and the work expected of them in case of an emergency.

Pipe lines are established under pressure near the bottom of shafts, both upcast and downcast, with connections to hose and pipe lines leading over different portions of the mines.

Underground telephone service is established in each mine to the most important inside stations, principally where hoisting motors are located, so that help can be quickly called. This telephone line is connected with each local office headquarters and also with the mine office. Gongs are placed whereby a general alarm can be sounded from the surface or the shaft bottom to the inside partings, from whence information can be carried by drivers to the men in case quick retreat is desired.

TIMBERS ARE PROTECTED

A pulp-plaster covering for timbers at the shaft bottom is used in order to render them more nearly fireproof, and holes and openings which would lead flames back of timbers are closed and sealed with pulp plaster as well.

No underground stables for mules are permitted, and all mules are lowered into the mine at the beginning of work and taken out at quitting time in the evening.

No oils are permitted to be taken back any distance into the mines, particularly gasoline and kerosene. The places where pit cars are oiled are covered with ashes, cinders or sand, which will absorb the oil and enable it to be readily loaded out. This prevents the oil from saturating the slate flooring and timbers. Not more than one day's supply of oil for lubricating pit cars is allowed in the mine at any one time. Before pit-car oil is taken into the mine it is tested with an open light placed over the vessel in which it is contained to see that the vapors are not inflammable or will not ignite.

In addition to the check system, a bar chain is put across the entry at least 15 ft. from the cage bottom in each mine, to prevent crowding of men to a place nearer than this distance in case of trouble. Large quantities of scrap pipe which are practically worthless are filled with concrete and used for permanent cribbing to prevent fire hazard, instead of using wooden timbers.

Lamp houses are located on the surface convenient to the shaft opening. All lamps are filled on top, and no lamps are filled at the bottom of the shafts or elsewhere underground.

RULES GOVERNING ACTION IN CASE OF FIRE

The following fire rules are in effect:

1. All fire equipment shall be tested each week in actual drill, both on the surface as well as in the mine workings.

2. The alarm of fire on the surface shall be short continuous blasts of the steam whistle.

3. The ringing of the electrical alarm gongs indicates fire in the underground workings, the signals being as follows: (a) Continuous unbroken ringing of the gongs means that all employees should go to the main shaft. (b) A succession of short rings of the gongs means that all employees should go to the escapement shaft.

4. Upon hearing the fire-alarm gongs it will be the duty of the pit boss and his assistants to go to their respective stations at the bottom of each shaft, as directed by the superintendent, to give directions and preserve order.

5. After the fire alarm has been given, either on the surface or below ground, no coal except that on the ascending cage must be hoisted, and both cages must be immediately relieved of cars.

6. All men upon hearing the alarm of fire must immediately go to their respective stations and prepare the pumps, hydrants, hose and chemical extinguishers for action.

7. Hoisting engineers must remain in the engine room and obey regular signals and the orders of the superintendent or mine manager.

8. The firemen must remain at the boilers unless otherwise directed by the superintendent or pit boss.

9. The head dumper or weigh boss, as may be directed, shall have charge of the gates and guard the shaft at the surface landing and attend to mine signals.

10. The bottom cager will retain charge of the cages and attend to fire-alarm and other signals at the shaft bottom.

11. The machinist's duty will be to stand by and attend to the fire pumps only.

12. It shall be the duty of the head blacksmith to open valves for conveying water to the fan house and all water pipes on the surface and in the mines.

13. Certain assigned duties shall be given to a sufficient number of men to take charge of valves connected with all underground fire pipe lines, handle the hose on the surface and in the workings and take charge of the chemical extinguishers, in the surface buildings as well as in the mine.

14. Under no circumstances must hay be permitted to be loaded into a car and sent into the mine until all miners of the day shift are on the surface, and it must then be lowered into the mine only after it has been inspected by the hoisting engineer or top foreman to see that it has been thoroughly wet to make it impossible of ignition from any cause, and the hoisting engineer on duty at the time is charged with the knowledge of such inspection.

15. The first duty of the night watchman or such other person as may be designated by the superintendent (when the weather permits) shall be to unreel two lines of hose (one on each side of the mine) and open the hydrant valves.

16. On the discovery of fire at night, the steam whistle must be blown continuously and the electric alarm gongs sounded as indicated in Rules 2 and 3.

17. The night forces must, upon the alarm of fire, go to their regular stations and duties as assigned to them by the superintendent.

The greatest degree of protection and safety to life and property can only be secured by cool, active action on the part of those in charge of the supervision of the forces and those in charge of the fire apparatus, as well as by calmness and good order on the part of all employees in leaving the mine.

Fire apparatus must not be handled by anyone except those authorized to do so, and then only in case of fire or for the purpose of drill or repairing. Any person known to have mutilated or damaged any part of the fire machinery and appliances will be prosecuted, and in addition thereto will, if an employee, be discharged.

USE OF FIRE EXTINGUISHERS

The following instructions are in effect governing the use and care of fire extinguishers:

The employee in charge of the building in which chemical fire extinguishers are located is required to see that these extinguishers are kept in their proper location, clean and in order for immediate use at all times, and that a proper record of the date when each was last charged is registered on the tag attached to the extinguisher. Except in case of fire these extinguishers are not to be tampered with or discharged, other than for testing purposes once each year, on July 1, on which date all chemical extinguishers must be discharged and recharged. Requisitions for recharge should be made on the purchasing department and should specifically state the capacity and makers' name of the extinguisher.

A report is made twice a year showing in what buildings fire extinguishers are located and the number in each place, number of recharges on hand, if rubber connections are in good order and if there is a fire-extinguisher placard, issued by the insurance department, posted near each extinguisher, giving instructions for its use and care.

All employees, particularly the fire brigade, are instructed as to the use of fire extinguishers and their location. All fire extinguishers are recharged a week or ten days after July 1 of each year, and a tag is attached to each fire extinguisher showing the date of recharging. Fire extinguishers are filled with a solution of sulphuric acid, sodium bicarbonate and water in proper proportions. The extinguisher used is the one manufactured by the Northern Fire Apparatus Co., Minneapolis, Minn., and is the standard adopted for all mines.

All boilers are covered by insurance against explosions, and inspections are regularly made by representatives of the Insurance Department and the insurance company carrying the risk, with reports rendered showing condition of boilers and repairs needed. Boilers are not permitted to be operated under steam pressure above that stipulated by the insurance company. Violation of this rule results in the discharge of the employee at fault. All boilers are numbered consecutively at each plant, and a statement is rendered twice each year showing the location, nature of the building in which it is housed, type of boiler, allowable steam pressure, size of the boiler and the purpose for which it is employed.

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Carbonization of Peat

The Swedish experts commissioned to examine Laval's method of carbonizing peat, says *Commerce Reports*, submitted their report on Mar. 19. Briefly stated, the processes employed in this method are as follows: The peat is diluted with a large quantity of water. The resulting pap is then heated to a temperature of 150° to 250° C. (302° to 482° F.). The chemical changes thus produced leave a dry mass of an increased heat value, though reduced in volume, the physical constitution of the material being altered in such a way that water can be removed in a much larger proportion.

By artificial drying peat powder is then easily prepared, to be used in the manufacture of briquettes. With a small apparatus the commission had no difficulty in preparing a product containing only 52 per cent. of water. The experts were of the opinion that a small plant manufacturing 10 tons of peat fuel per day would have to reckon with a cost of at least 15 crowns ($4.02) per ton of peat powder containing 10 per cent. of water and having an effective heat value of 4800 calories, the cost not including interest or amortization. In their opinion, however, better results might be expected for a larger plant manufacturing at least 50 tons of fuel per day. Here the cost was reckoned at 13 crowns ($3.48) per ton, including interest and amortization.

Under normal conditions a majority of the experts believed such peat fuel could be sold with profit. Captain Wallgren, one of the five experts, filed a dissenting opinion. He calculates the original cost of producing 1 ton of water-free peat powder, with an effective heat value of 5240 calories, at 11.21 crowns ($3), exclusive of interest and other charges, which would increase the cost of production to 15 or 16 crowns ($4.02 to $4.29). He holds, therefore, that peat fuel cannot compete with coal under normal conditions. The possibilities of improving the working methods, however, are great, and should the prices of coal remain high, even after the war, the prospects for marketing peat fuel will be good.

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The weight in pounds per 1000 ft. of any electrical conductor may be found by multiplying its area in circular mils by the pounds per 1000 ft. per circular mil.

The Canadian Collieries, Ltd.

By E. Jacobs*

SYNOPSIS—After meeting and discussing fully the affairs of the company, the bondholders of the Canadian Collieries, Ltd., voted unanimously to waive default of payment of interest on the bonds for three years or until one year after the conclusion of peace in Europe.

At the annual meeting of the Canadian Collieries (Dunsmuir), Ltd., held in London in March, the affairs of the company were fully discussed and resolutions unanimously adopted waiving the defaults which the company had made on Sept. 1, 1914, and Mar. 1, 1915, in payment of interest on its bonds.

This waiver covers a period of three years; that is, until Mar. 1, 1918, or as the resolutions prescribed "to the half yearly date for payment of interest upon the bonds occurring next before the expiration of one year from the formal conclusion of peace between Great Britain on the one hand and Germany and Austria on the other hand (whichever period may be the longer). Then the bond interest shall be payable only as and when and to the extent that the net profits of the company as certified by the auditors of the company for the time being are sufficient to pay the same, any arrears of such interest being nevertheless carried forward and paid out of the net profits of any subsequent year."

The reason for this and other modifications of the trust deed of Aug. 6, 1910, securing the 5-per cent. first-mortgage gold bonds of the company, were fully explained at the meeting. As the chairman pointed out, there were three alternatives open to the bondholders: (1) They could establish a receivership, (2) they could commence the foreclosure of the mortgage, or (3) they could waive the default and extend the time for payment of the bond interest.

The last-mentioned alternative was unanimously adopted, and to that end the meeting appointed a committee of five of the bondholders. In this committee was vested a voting trust, giving it entire control over the administration and management of the company. The five members are Stanley C. Boulter, Robert H. Benson, David A. Bevan, John A. Mullens, Jr., and Ernest G. Ridpath.

The full report of the meeting includes many interesting features. W. E. Rundle, general manager of the National Trust Co., Ltd., trustee for the bondholders, presided. During the discussion he stated that Sir William Mackenzie (of Mackenzie & Mann, of Toronto, Ont., at the head of the Canadian Northern and the Canadian Pacific railways) is now a director of the National Trust Co. E. R. Wood and F. H. Phippen are also directors. He also stated that of 22 directors of the National Trust Co., only two were also directors of the Canadian Collieries Co., and he gave assurance that those two had not at any time attempted to influence the trustees with regard to anything arising out of the trusteeship; also that the National Trust Co. had ably administered this trusteeship. So far as the National Trust Co. is concerned, the chairman stated that it has no interest in the Canadian Collieries company save as trustee. It does not

TIPPLE OF THE NO. 8 MINE OF THE CANADIAN COLLIERIES CO.

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*Victoria, B. C.

MINERS' DWELLINGS AT NO. 8 MINE, CANADIAN COLLIERIES CO.

REINFORCED-CONCRETE SUBSTRUCTURE OF TIPPLE OF NO. 8 MINE

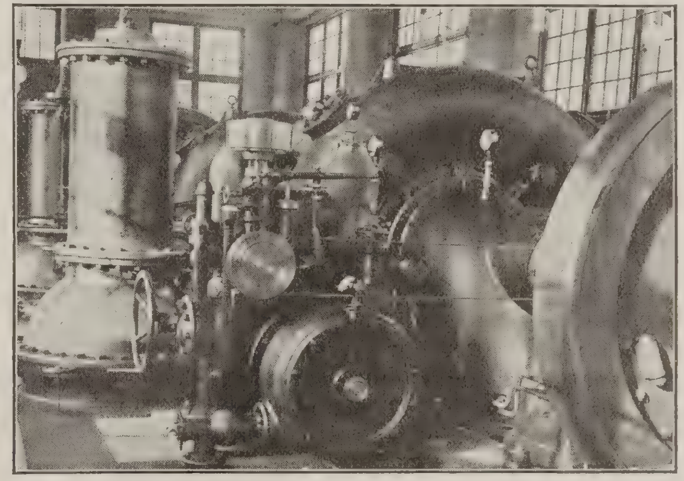
own a dollar's worth of bonds or stocks in the Collieries company nor any stock in the Canadian Northern Ry.

H. S. Fleming, chairman of the Executive Committee of the Canadian Collieries company, explained at length the causes leading to the present condition of the firm. After reviewing the two years' strike of the miners, he referred to the trade depression, saying in this connection: "To show you the direct effect which this has had upon the position of the company, I may state that during last winter the total consumption of domestic coal in the city of Vancouver was barely one-half of what it had been two years before. This of course affected all the coal-mining companies on the British Columbia coast, but the Collieries company most, for the reason that it is the largest. The use of coal for industrial and public purposes has been similarly cut down. The war disorganized shipping, and there was and is little demand for supplying ships' bunkers with coal; in addition, there was the increased use of fuel oil."

SUBSTANTIAL PROFITS CAN BE EARNED

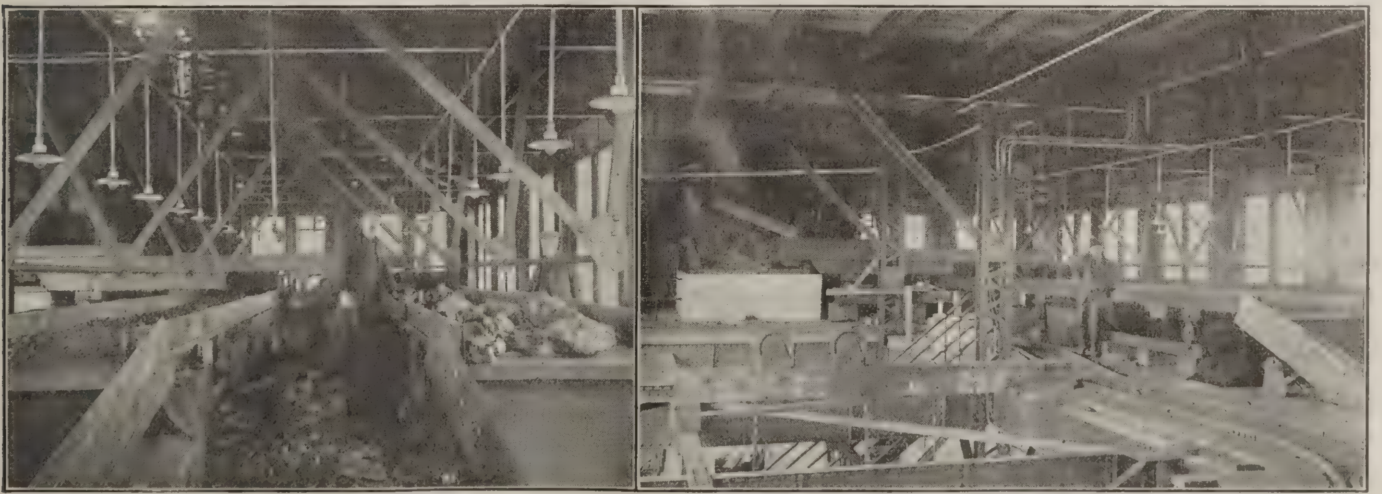
It was stated, however, that with large orders received from San Francisco and elsewhere during August and September of 1914 the company in those months earned net profits of $46,000 and $54,000 respectively, but in October and November following, the net profits were only $1300 and $1100. It is believed that the August and September results show that if given even a moderately good market for the coal the company's mines are capable of earning substantial profits, and that the money put into the property has not been wasted. It is confidently believed that the market is certain to come sooner or later, that the war cannot last forever, nor will the depression of trade. The Pacific Coast will begin to grow again in population and in industry.

Replying to a question regarding the serious shrinkage of the profits between the times the mines were worked by the Dunsmuir interests and the date of the statement of accounts presented, Mr. Fleming said that the operating earnings in the year ended June 30, 1911, were $665,000 from the mines or $728,000 from all sources. During the next year they were $546,000 from the mines and $751,000 from all sources. During the succeeding year there was a strike which practically stopped operations at the mines for a short time and made it difficult to produce coal.



INTERIOR OF POWER HOUSE

In regard to the money subscribed, $3,500,000 of this has gone into improvements in the mines and property



MARCUS SCREENS IN NO. 8 TIPPLE IN OPERATION INTERIOR VIEW OF NO. 8 TIPPLE DURING CONSTRUCTION generally. A considerable sum subscribed has not been taken as working capital owing to the Dunsmuirs not having delivered to the company all the assets that were expected would be received; but a decision as to this was now being obtained from the Privy Council of Great Britain. No directors of the company receive a salary except two local directors who are each paid $500. Many other questions were answered before the resolutions were voted on and adopted unanimously, as has been previously stated.

* * *

The Anthracite Decisions

By Our Philadelphia Correspondent

SYNOPSIS—The Delaware, Lackawanna & Western R.R. has been found to be operating unlawfully and has made the necessary readjustments of its management. The Philadelphia & Reading Coal & Iron Co. was found to be conducting its business lawfully, but the relation between the Central Railroad of New Jersey and the Wilkes-Barre Coal Co. must be dissolved.

The two recent court decisions involving the Reading and the Lackawanna anthracite interests coming practically at the same time have served to focus interest on the apparently divergent decisions in the two instances. However, the difference between the two decisions, as suggested, is really only on the face, and as a matter of fact the results are so likely to tend to the same end that it is worth while to study them together.

In the first place it is well to remember that the suits were brought by the United States Government, both being based on the commodity clause of the Hepburn Act of 1906, the provisions of which became effective May 1, 1908, and in express terms prohibited any railway company engaged in interstate commerce to both mine and transport coal; or in still plainer words: "No railroad company can engage in the coal business; its sole purpose is that of a carrier of goods for other people."

It is also important to bear in mind that while the decision in the Lackawanna case was handed down by the United States Supreme Court and is final, yet the decision in the case of the Reading was the verdict of the United States District Court for Pennsylvania, and this opinion is subject to review by the United States Supreme Court, which appeal will probably be taken.

As stated, the decision in the Lackawanna issue was made by the United States Supreme Court and was a reversal of the opinion delivered by the United States District Court for New Jersey, from which opinion the Government had appealed. The decision of the Supreme Court, which was unanimous, was that the Delaware, Lackawanna & Western R.R. did violate the commodities clause of the Hepburn law, and practically the entire evidence adduced to sustain this decision was based on the now celebrated "65 per cent. contract." This contract provided that the coal company should buy from the railroad company (which latter company both owned and operated the mines) all the coal mined, the price to be paid the railroad company to be 65 per cent. of the New York price on the day of delivery. The coal company was also prohibited from buying coal from any other company without permission from the railroad company.

It was contended that the nature of such a contract made it possible for the railroad company to charge exorbitant prices to the public; raise the New York prices; influence prices by the failure to make prompt delivery or by suspending operations in times of urgent need, thereby tending to increase the New York price; together with a number of lesser and minor objections.

Ability to Injure Should Not Be Urged as a Proof of Intention

Strictly and literally construed the companies under this contract could do all the things imputed to them; that is, such wrong-doing was within the bounds of possibility; but the essential point brought out in the Supreme Court decision was that *the companies did not do any of them,* and as a matter of fact the Delaware, Lackawanna & Western R.R. never could do any or all of the things so mentioned, for the very reason that that company only produces 10 per cent. of the entire output of coal.

The potential element for evil in the contract was very much less than that of Jake Landis, an aged contractor who built a church. He had made a blunder and was sore perplexed. A venerable deacon stood within the walls of the church and rushed up to one of the stone masons, tears streaming from his eyes:

"Choe, tell Chake not to swear!"

"He's not swearing," answered the man.

"Yes; but he might!" bawled the deacon.

And just so it was admitted in the opinion as written by Justice Lamar, although not in just that way. He said: "It is argued that the present objections to the contract are purely academic," or in the words of the layman, technical. Continuing the justice says: "But the validity of the contract depends upon its terms," and these terms the court has just decided are unlawful, even though they have harmed no one. It is the law, and the court says in its interpretation or reading of the law that the railroad company was a seller of coal on the one hand, and the coal company, as a coal company, was neither an independent buyer nor a free agent.

The decision directs that the railroad company shall entirely disassociate itself from the coal company, and as is already well known such steps have been taken by the latter company. A few days ago an entirely new directorate was elected, none of whom were officials in the railroad company. The offices were removed so that they would no longer be in the same building with the railroad concern. The coal company will be a free agent in the purchase of coal, for it will not only take fuel from the railroad mines at a fixed price, with the 65 per cent. clause eliminated, but it will have perfect freedom to purchase from any one offering to sell.

The decision is most helpful in that it plainly interprets the law for the guidance of all. The coal companies are law-abiding, as is proved by the fact that the "Lackawanna" changed its contract over a year ago in order to comply with the law, but the present suit was based upon the existence of a contract prior to that time. In this connection President Loomis, of the Delaware, Lackawanna & Western R.R. Co., states: "We are anxious to do anything that is asked of us by the court. We have nothing to conceal, and we are glad to have a final decision for our guide."

In referring to the recent decision of the United States District Court in favor of the Philadelphia & Reading Coal & Iron Co., it will be well to recall that three years ago the Government brought suit against all the anthracite roads as a general combination, which suit was lost. After this decision the Government decided upon suing the so-called smaller combinations, and the present decision is the outcome of the suit started against the Reading company two years ago.

Philadelphia & Reading Coal & Iron Co. Completely Exonerated

In this decision, as written by Judge McPherson, with the concurrence of Judges Buffington and Hunt, the Reading company is adjudged not guilty of a violation of the commodities clause of the Hepburn act. The decision states that the evidence did not show that the Reading had any connection with the Lehigh Coal & Navigation Co. except a minor but nevertheless legal agreement made in 1871; that there was no evidence of injury to any coal dealers; that the company never demanded a high price when coal was in greatest demand, although it was shown that this was a common practice among individuals. Neither was the price of coal at any time unreasonable when it was considered in the light of the profit returned to the company. This was conclusively proven to be 18c. per ton, and even when some miscellaneous receipts were added the profit was only raised to 20c.

The decision further stated that while the connection of the Lehigh & Wilkes-Barre Coal Co. with the Central R.R. of New Jersey had not been brought into question, yet the court advised that inasmuch as the Reading company controlled the C. R. R. of N. J., the Lehigh & Wilkes-Barre Coal Co. should be separated from the transportation company, as "the union of control by the railroad company is objectionable."

The remainder of the decision shows that the Philadelphia & Reading Coal & Iron Co. is a separate and distinct corporation in its relations to the Philadelphia & Reading Ry.

To a close observer this separation has been going on over a period of years, in compliance with decisions handed down some years since. It actually began as far back as 1906 when all the employees of the Philadelphia & Reading Coal & Iron Co. were deprived of free transportation on the Philadelphia & Reading Ry., a privilege which they had enjoyed on equal terms with the railway employees. The separation continued in various ways until the retirement of C. E. Henderson, who for years had been second vice-president of the railway company and general manager of the coal company. At that time the coal company elected a general manager separate and distinct from any affiliation with the railway company, and finally two years ago upon the death of George F. Baer the coal company elected its own president.

It can now be truly said, because of these two apparently diverse decisions, that the Delaware & Lackawanna Coal Co. and the Philadelphia & Reading Coal & Iron Co. both have the same corporate status in the eyes of the law, the only point of difference, if it can be so called, being that the Philadelphia & Reading Coal & Iron Co. arrived at that point several years ahead of the Lackawanna company.

Companies Can Devote Energy to Mining

Now since these two companies have adjusted themselves to the requirements of the law, as clarified by the two decisions, it is right and proper to state that they have not at any time, to use the words of the decision in the Reading case, "consciously and deliberately violated the law, for the commodity clause of the Hepburn act of 1906 rendered unlawful many things which were lawful under the statutes of the states," previous to the enactment of the Hepburn law of 1906, and it was these state statutes under which the companies were operating.

The two decisions should certainly be of great benefit to all anthracite-producing companies, as it clearly indicates to them what they can and cannot do under this act. Now that the law is clearly defined for the first time, the companies can take courage and devote all their time and energies to developing their business, as every business organization is entitled to do. Their energies will be no longer diverted to defending their lives, and they will be saved the enormous expense entailed in that defense. This expense, too, it must be borne in mind, has been added to the price paid for coal by the consumer.

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Slight Improvement in Coal Mining Business

The output of bituminous coal in the United States for the first six months of 1915 is estimated by C. E. Lesher, of the United States Geological Survey, to be between 180,000,000 and 190,000,000 short tons, the rate of production having been from 85 to 90 per cent. of the average for the previous year. Thus the bituminous coal production during this six-month period has been considerably less than for the corresponding period in 1914 and is little, if any, greater than the output during the last half of that year. The rate of production this year decreased after January, reached low ebb in March and April and is now increasing. The states west of the Mississippi River, which in 1914 produced less than 13 per cent. of the total, do not appear to have suffered from this decrease as much as the states east of it, reports from certain districts in the West showing an increase in the production over that of 1914.

This is attributed to the increase in metal mining and smelting and to greater railroad activity. In the East the loss of bunker trade on the Atlantic seaboard and the slowness of the lake season have been only partly offset by the increasing coal exports. The recent activity in the iron business has been slow to affect the coal trade, although coke has gained considerably during the last two months and for the rest of 1915 the increased output should continue.

The anthracite producers have fared better than the soft-coal operators, since it is estimated that the output of anthracite has fallen off only from 3 to 5 per cent. below the average for 1914.

Raising Mushrooms in a Coal Mine

By Theodore F. Imbach*

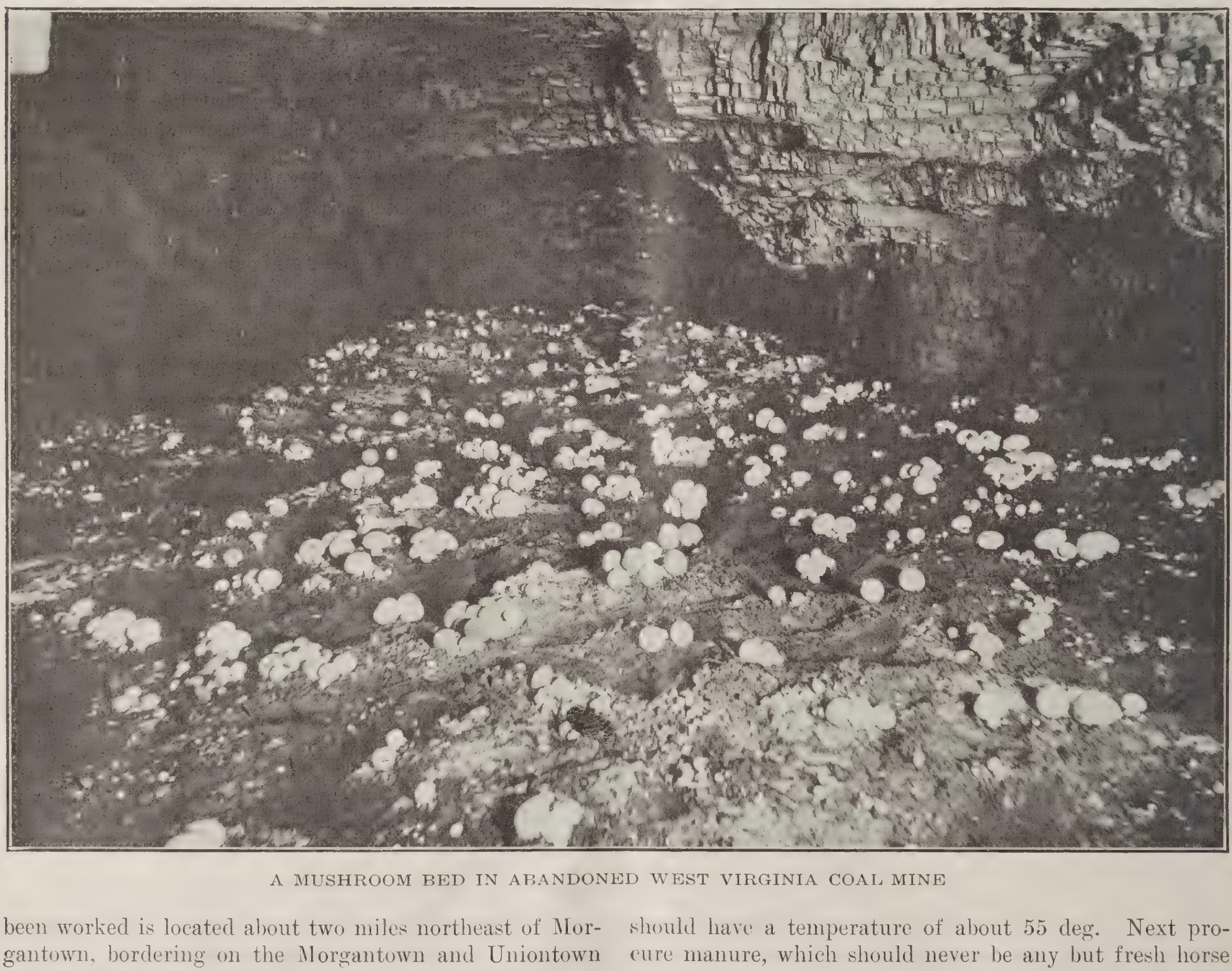
SYNOPSIS—An interesting detailed description of a successful venture in mushroom cultivation. Many abandoned coal mines are ideal places to grow this table delicacy. There is a ready market for a large production.

The abandoned mine in which I first began growing mushrooms in 1911 is located in what is known as the Pittsburgh coal seam in Pennsylvania and West Virginia. The elevation of this seam above sea level at the mine referred to is about 1200 ft., or about 400 ft. above pool level in the Monongahela River at Morgantown. The "state farm" under which this mine has been worked is located about two miles northeast of Morgantown, bordering on the Morgantown and Uniontown pike. The mine was first opened up on the south end of the farm in 1845 by Joseph Ridgeway, and the coal was used mostly for domestic purposes.

From 1860 to 1890, when the use of natural gas was introduced into Morgantown, this coal was mined extensively and transported by wagon to many homes in Morgantown for heating purposes. The mine is so located that it has a natural drainage; the Pittsburgh sandstone (25 ft. or more in thickness) lying a few inches above the coal forms a substantial roof. The seam varies from 6 to 9 ft. in thickness.

The experiments here described were undertaken when I was employed as assistant horticulturist at the West Virginia University Agricultural Experiment Station. It was then I discovered that abandoned mines are well adapted to the growing of mushrooms. A large number of the rooms in mines have an even temperature the year round and in other respects are just right for growing mushrooms.

In selecting the places, get rooms not too wet. Do not lay beds on any floor that is liable to flood or places that have leakage or dripping overhead, and the room should have a temperature of about 55 deg. Next procure manure, which should never be any but fresh horse manure from stables where clean straw is used for bedding and horses have been grain-fed. Manure where hay or grass alone is fed seems to be of very little value to fertilize the ground in which mushrooms are grown.



A MUSHROOM BED IN ABANDONED WEST VIRGINIA COAL MINE

Having the right kind of material, the next step is to get it into condition to make up your beds. You should have a fair-sized pile of manure in order that it may heat sufficiently and properly compost. Get your manure as near as possible at one time and keep it in one large pile 3 to 5 ft. high. Then begin turning thoroughly;

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*Morgantown, W. Va.

shake each forkful and keep putting outside manure in the center. I turned manure between 15 and 20 times.

Manure Should Be Turned

The reason for turning the manure so often is simply this: If it were used in a fresh state it would heat to such an extent, when made into beds, that it would burn. The chemicals which are contained in fresh horse manure must be reduced to some extent before they furnish just the proper nourishment for the growing of mushrooms. The manure is turned to reduce the heat so that the temperature can be controlled to moderate the chemicals and prevent the manure from later burning in the beds and running up a high temperature.

I maintained the proper amount of moisture by watering with a hose. Never allow manure to burn, or drown it by too much water. It was 20 days from the time I procured manure and began working it over until it was right to make up into beds. The straw was well broken up and had turned a dark brown while the manure was curing. In preparing the beds, do not make any of them less than 50 sq.ft.—the larger the better.

Face your beds with 12-in. boards set on edge; brace well so they do not move out when transferring the manure inside. Make the beds so you can reach over them without getting on them after mushrooms begin growing. Put manure in in layers; tramp each layer well with your feet, or if the room is too low use a heavy block 12 in. square and two or three inches thick, with handle. Fill each bed up to the top of the boards, always keeping the surface even when building up. In putting on the last layer of manure use short manure, which is raked up after long manure has been hauled in. It will give a more even surface and you will not have straws sticking up after the bed is completed.

Each bed should be fairly wet, but not soggy; if too dry, water it, but be careful to water uniformly all over. It is easier to water a bed the second time than to get it too wet, which would cause you to make it over. After the bed has been made two or three days, procure a good hotbed thermometer and stick it into the bed for a depth of four inches about every 10 ft. The thermometer will run up from 105 to 140 deg. Take the temperature every day until it goes down to 75 or 80 deg., which will be 18 or 20 days after you make up the beds.

After the Beds Are Ready

You are now ready to spawn, which should have been procured in advance from a reliable grower. Spawn should be as fresh as possible, but will keep six months if stored in a dry room at a temperature of 60 deg. If kept too moist it will start to grow spawn, or, to use the scientific name, mycelium, which corresponds to seed. There are two kinds of spawn—the English, called virgin spawn, and the American, called pure culture. I have always had best success from pure culture. It comes in bricks, which should be broken in six to eight pieces. Make holes in the bed 9 to 10 in. apart. I used a straight-pronged weeding fork with prongs 4 in. long. Make the holes on a slant. Put pieces of spawn in each hole, with end showing most life uppermost. It should be covered about one inch. Use brick or block to pound the manure back in place, always keeping the surface smooth and level. Watch the temperature and when it drops to 60 or 65 deg., which will take from 8 to 25 days, you will be ready for soiling, which consists of covering the bed with one inch of soil.

MUSHROOMS IN BASKETS CONTAINING ONE POUND EACH READY TO BE MARKETED

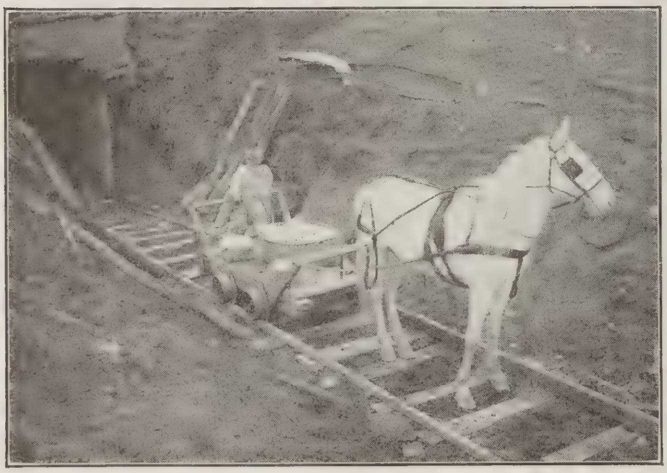
Putting Soil on the Beds

I used soil that had been composted for putting plants in greenhouses on about half of my beds, and on the rest ordinary garden soil, and the results were the same. Have soil moist, but not wet or sticky. Do not use a clay soil, as it will bake and crack on the beds. The soil should be screened to take out rocks and lumps. Use your pounder again to level the soil and get an even surface. If your bed becomes dry, water very lightly with fine spray or mist. I used a fruit spray pump for all watering after the beds were made up. Have the temperature of the water about 70 deg. Never drown the bed, but keep the walk moist and you will need but little water. My first mushrooms appeared in 39 days after spawning, and were in full bearing 26 days later, and continued to bear for three months.

From the time the beds be in to bear, go over them each day, gathering the mushrooms that are ready to pick. The best way to tell when they are ready is by picking all those where the frill connecting the cap or top has separated from the stem; or, better yet, just before this separation takes place. This makes the mushrooms better "keepers" and "shippers," for if they are picked when they are quite open or flat the under surface turns black quickly and makes them less desirable for the market.

It is the general impression that a mushroom springs up overnight. Just why this opinion has been formed I cannot say. There is really no reason why a mushroom should grow or develop more at night than during the daytime. The wild ones are usually gathered during the cool of the morning, before the warm weather affects them. This may be one reason why the impression is formed that they grow up overnight.

In cultivating mushrooms the conditions are also very different. The temperature and moisture conditions are more even, and I would say that under ordinary conditions it would take from two days to a week for a mushroom to develop after it has grown above the ground. By this I mean that it takes somewhat longer for a large mushroom to reach its full growth than it does for a small one. Do not pull your mushrooms up or cut them off. In pulling them up you will surely disturb the roots or mycelium of those growing near the one gathered or those which as yet have not come up.


MR. IMBACH'S SON HAULING MUSHROOMS FROM MINE WITH HIS PONY

If you were to cut them off you would leave a stump which would decay and have a tendency to spoil the entire bed.

How to Gather Mushrooms

If the mushroom, which is ready to pick, is growing by itself, take hold of it by the cap and with a little twist separate it from the roots, while if it is in a clump with others not yet ready, hold the clump with one hand and twist out the one to be gathered. It is well to go over the beds every few days and with a little fresh soil fill the holes left by taking out the mushrooms, and at the same time remove any that show signs of decay by being disturbed. This will keep your beds clean and preserve an even surface.

The best way to gather your crop is to have two baskets, and as you twist out the mushrooms cut off the lower part of the stem with the root attached and put it in one basket and the mushroom into the other. In this way the dirt adhering to the root will not be sprinkled over the mushrooms and they can be put on the packing table clean and free from dirt, while the stems and roots can be thrown out of doors and not in the paths, as I have seen done by careless growers.

Mushrooms were formerly marketed in baskets, but an attractive package helps to sell any article of food. A clean, white pasteboard box that will hold just a pound, I have found to be the best. Put your mushrooms on the market as soon after picking as possible. They will keep for two or three days, and they stand shipping well, as they do not break easily and need very little protection from the cold. They also retain in themselves a certain amount of heat, making them easy to handle even during cold weather. For local markets I used one- and two-quart berry boxes, which hold one and two pounds each.

My mushrooms were all graded, and I have found that it pays to separate them, putting the large, firm and perfect ones in one grade and the smaller ones, or button mushrooms, in another grade; and if by chance some have been overlooked in picking and become flat or open, I would advise putting them by themselves so as to keep the "number ones" and the "buttons" perfect.

A Ready Market

Some people, who do not doubt but that they can grow mushrooms, fear that they will not be able to sell them. Such fears, however, are entirely groundless, for the demand is increasing yearly, and the fact that I received higher prices for mushrooms during late years than I did in any of the years previous is very good evidence that the demand is growing faster than the supply. In every community there are plenty of people who will gladly buy all you can raise, but who have been unable to get them, as the bulk of all the mushrooms grown in this country has so far been sent to a few large cities. In every city of any size you will find a good market for your crop; and if you will take the matter up with any commission man who deals in vegetables and fruits, he will be glad to handle all you can send him; and the same is true of large hotels and restaurants.

The essential things are good manure, fresh spawn and a good man. Never attempt to grow mushrooms with a careless man.

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Motor Trucks Enlarge Available Territory of Retailers

On account of the extensive area of the city, the Philadelphia dealers are rapidly adopting the motor vehicle in order to facilitate deliveries. This increased use of the motor truck has brought about a peculiar condition. One large dealer who uses this method of delivery states that he does not know who his competitors are these days because dealers from far and wide are coming into his territory and seeking his trade.

Owing to the condition of the retail market no order is refused on account of a long haul. This is expected to adjust itself with the arrival of the busy days of fall and winter.

Storage of Powdered Coal

By Edward J. Kelly*

Coal storage has become an important problem in modern industrial life because of the possible occurrence of sudden fluctuations in the market conditions and labor troubles at the mines or with transportation companies. Anthracite offers practically no difficulty in the way of storage, as it is almost unaffected by weather conditions and it will not ignite spontaneously. Bituminous coals, however, when stored, disintegrate and are in great danger of spontaneous ignition.

This is due to an absorption of oxygen from the atmosphere by the coal itself. If the heat resulting from this reaction can be dissipated, no harm results; otherwise the temperature of the coal rises until the temperature of ignition is reached. The area of the surface exposed is a determining factor, and since this surface area is increased as the size of the particles is decreased, we can readily imagine the importance of this when applied to powdered coal.

Dennstedt and Schaper in *Zangew. Chem.*, 25, 2625-9, show that the greater the percentage of oxygen in the coal, the more liable it is to ignite spontaneously.

Porter and Taylor in *J. Ind. Eng. Chem.* 5, 292, state that "the development of heat on moistening dry coal . . . may contribute appreciably to the spontaneous heating of some coals in storage."

These opinions indicate two factors in the spontaneous ignition of powdered coal—the presence of oxygen and other occluded gases and the presence of moisture. Other causes of self-ignition are: 1. Pressure on the coal. 2. Presence of iron pyrites. 3. Volatile matter in the coal itself. 4. Temperature.

The effect of pressure is to increase the temperature of the pile of coal, and it varies as the height of the pile. It is suggested that the pile should never exceed a height of 12 ft.

The effect of iron pyrites is rather doubtful, as coals containing negligible quantities of this compound have been known to ignite spontaneously.

Coals which are fairly high in volatile matter are more subject to self-ignition. This has been fully borne out by the findings of Messrs. Tessenden and Wharton (*Bull. Univ. of Mo. Eng. Series,* Vol. 1, 1908).

The effect of temperature is considered by many authorities to be one of the important factors in spontaneous combustion, because the oxidation proceeds more rapidly as the temperature of the coal increases. Heat from the sun's rays may even be dangerous, an instance of this kind having occurred in the surface works of the Mayback colliery at Friedrichstahl, Germany. Floating coal dust deposited on some of the iron girders in layers of an inch or more, and was burned to a white ash when the girders became heated by the sun.

The following precautions should be observed in storing powdered coal: 1. Limit the height of the coal pile to 10 or 12 ft. 2. Isolate the coal from all sources of heat such as steam pipes, flues, reflecting surfaces and direct sunlight.

In regard to the conditions of storage, two different methods may be cited: 1. Storing in piles in the open air. 2. Storing in covered bins.

There seems to be very little to choose between these methods, save that all other things being equal, the covered bin would protect the coal from direct sunlight, which was shown to be a contributing factor in spontaneous ignition. If covered bins are used, added overhead charges will be entailed, while open storage on the other hand gives low costs.

I have been informed of a novel storage bin constructed for a firm in Maine. This bin contained several rows of upright beams. Saw-tooth projections were built on two sides of each upright, thereby forming air-spaces, which led into the main flue, the latter extending from the bottom of the bin to the top. When the bin was filled with coal, the heat generated and the gases given off escaped through the flues to the top of the bin and out into the air. It is perfectly obvious, however, that should the coal in the bin become ignited by any chance, the flues would produce a draft and so increase the rapidity of the combustion.

Bins should be constructed of stone, brick or concrete; if iron work has entered into the construction, it should be covered with concrete.

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Alberta Law Regulating Plans

A new law was passed in Alberta Province, Canada, by order-in-council June 8, 1915, being a regulation under sec. 138 of the Mines Act, regarding plans. The new law is known as Order No. 4 and took effect July 1, 1915. It requires that all plans kept in accordance with the provisions of the Mines Act shall be made of durable material and prepared by or under the supervision of a person holding a certificate as mine surveyor granted under the Mines Act. The law prohibits any person not so qualified from preparing such a plan, although it permits the preparation of a plan by such person when acting under the supervision of one who has qualified.

The law further provides that any applicant for such certificate must satisfy the board of examiners in regard to the following points: 1. The applicant must have had at least two years' practical experience in the surveying of mines, or must hold a diploma in scientific and mining training obtained after a course of study of at least two years at an educational institute approved by the Minister of Mines, or have taken a degree in scientific and mining subjects at a university so approved. 2. The applicant must be competent (a) to make an accurate survey of the workings of a coal mine and to connect the same with a surface survey, (b) to make accurate levelings, (c) to plot accurately surveys and levelings; (d) the applicant must produce evidence of sobriety and general good conduct.

The law further provides that where the workings of a mine have approached within 2000 ft. of any borehole drilled for the purpose of developing natural gas or oil the owner, agent or manager of the mine shall keep in the office a correct plan of the mine drawn to the required scale and showing the position of said borehole in relation to the mine workings and the projected workings. A copy of this plan must be forwarded to the chief inspector of mines not later than Jan. 31 each year.

Each plan required by the Mines Act must bear the date of the last survey and the signature of the person making such survey or the signature of the certificated person under whose supervision the work has been done.

New Byproduct Coke Ovens in England

The Ebbw Vale Steel, Iron & Coal Co., Ltd., in Monmouthshire, England, has opened a modern plant for the production of 4000 tons of coke per week and the recovery of byproducts, which have hitherto been largely neglected in the district, says Consul L. A. Lathrop in *Commerce Reports*. The ovens are on the direct recovery system and were erected by the patentees, Messrs. Koppers, of Sheffield, England.

With the quality of coal mined by the company, it is expected to produce an excess of 9000 cu.ft. of gas per long ton of coal, from 5 to 6 gal. of tar, 20 lb. of sulphate of ammonia and from 15 to 16 cwt. (1 cwt. = 112 lb.) of coke. Further extensions of the plant will be made to recover benzol and toluol.

Extracts from a Superintendent's Diary

Every once in a while I am given opportunity to reap rich rewards in exchange for the prestige that is supposed to attach to my signature.

It may be a real-estate broker disposing of town lots or an insurance solicitor selling stock as well as policies in a new company, or a solicitor getting charter members for a burial association, or a wildcat bank, or what not—the programme is always the same. First they approach me and attempt to interest me in their scheme by presenting it strictly on its merits; failing in this, they drop vague hints about the possibility of my getting in on the ground floor; and still getting no encouragement, they throw caution to the winds and offer to take me in in payment for my influence.

Fortunately for my peace of mind, I had my eye-teeth cut early in my career and the most loquacious solicitor cannot interest me if there is the slightest suspicion of his having singled me out because of my position.

Today, however, a solicitor got an interview with me, and he did it in spite of the fact that he let it be known from the start that he wanted my influence. Probably the very fact of his giving me warning in advance aroused my curiosity to a point where I could not send him away without finding out what he looked like and what he was up to. At any rate, he got into my office under circumstances so favorable to his mission that he was half way through with his plea before I had a chance to put in a word.

He was selling stereoscopes—just plain old-time stereoscopes that had such a vogue years ago before phonographs and moving pictures came into being to crowd out all other forms of amusement; so long ago, in fact, that I had entirely forgotten that such an instrument ever had an existence. The sight of it brought a smile to my lips, which was probably just what he most desired, for his countenance immediately took on an expression which seemed to say, "I've got him going."

For use with his stereoscope he had two distinct series of pictures. One series was got up to illustrate the importance of the science of sanitation as applied to the home, the village, and the city. It went into all of the details and pictured in the clearest manner imaginable the results of the very latest investigations.

When he asked me what I thought about them, I had to acknowledge that they were of great value. "Well, just give me an order for a set and I'll have every family in your camp following your example. It will be the best lead you ever made," was the way he expressed it.

Seeing that I hesitated, he brought out the second series. It dealt with domestic science—showed the different kinds of foods and how to prepare them, also the effects of depending upon poorly prepared foods. My wife takes an interest in such matters and gives the women of our camp the benefit of her knowledge, but I am sure that even she could have got many new ideas from the pictures.

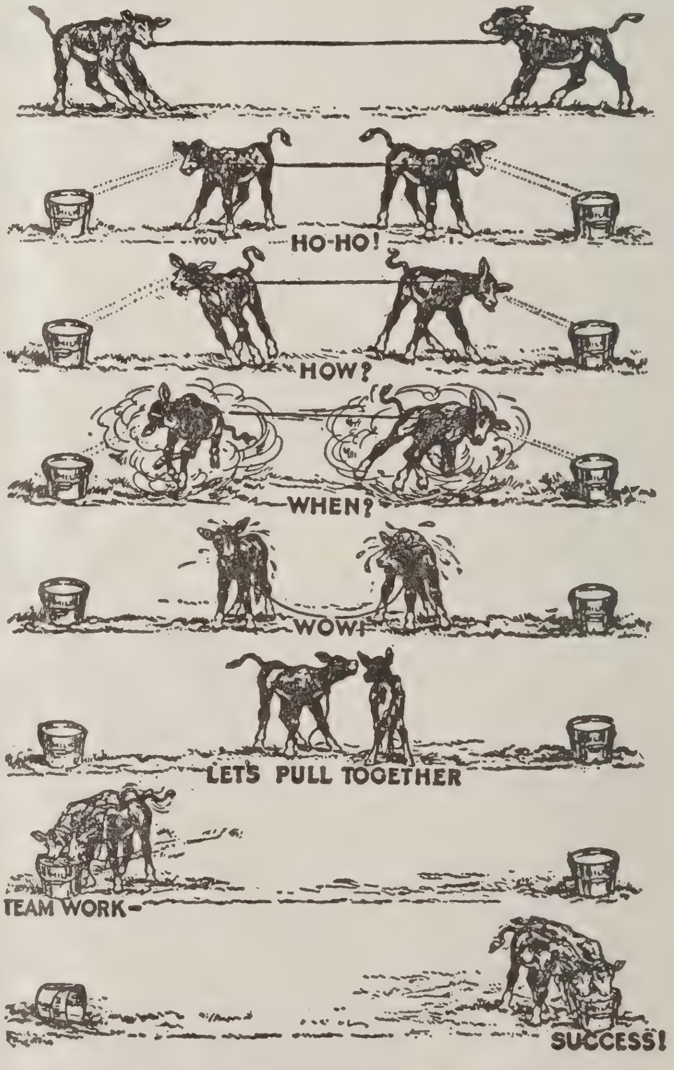
Again I was assured that it all hinged on my decision.

I didn't put my name on his order book, but I am not sure now that I acted wisely in refusing to donate my influence in his behalf.

Teamwork

The accompanying sketch was used effectively by the *Santa Fé Employees' Magazine* to explain the wisdom of coöperation and teamwork.

Not only does it show that teamwork means success for everyone involved, but it depicts the tremendous amount of labor wasted through what might be termed bull-headed, unreasoning selfishness.


YOU
HO-HO!
HOW?
WHEN?
WOW!
LET'S PULL TOGETHER
TEAM WORK-
SUCCESS!

Teamwork not only means the accomplishment of a given aim, but it permits ease of operation to such an extent that maximum results are attained with a minimum of effort.

Chief Inspector of Mines, British Columbia

Having noted recent references in the Canadian press relating to certain allegations emanating from labor organizations and reflecting on the ability and integrity of Thomas Graham, chief inspector of mines in the Province of British Columbia, it gives *Coal Age* great pleasure to add its endorsement of the sterling worth and character of Mr. Graham. What we have to say is wholly unsolicited, and offered as a free commentary on the observed acts and ability of the man who has filled the office of chief mine inspector for the Canadian Province with success for more than three years.

An intimate acquaintance of twelve years with Mr. Graham permits the editor of *Coal Age* to give first-hand testimony regarding his mining ability and mature judgment. Any attempt to discredit either the work or the ability of Mr. Graham can only reflect on the honesty and candor of the instigators. It would have no effect on those acquainted with the present incumbent of the office of the chief inspector of mines in British Columbia.

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Another Portable Electric Cap Lamp Approved

The Bureau of Mines, on July 16, 1915, approved for safety and for practicability and efficiency in general service the miners' portable electric lamp known as the Manlite No. 8 lamp, manufactured by the Mannesmann Light Co. of America, 331 Fourth Ave., New York City. Approval No. 11 has been issued to this company.

The only bulbs so far approved for use with these lamps are the bulbs identified by the symbol "C-5," manufactured by the Mannesmann Light Co. of America.

This lamp will be distinguished by a plate bearing the seal of the Bureau of Mines, Approval No. 11, and other information relative to the approval.

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The American Mine Safety Association at An End

At a meeting of the American Mine Safety Association held at Sewickley, Penn., it was decided to accept the generous offer of the National Safety Council and to amalgamate with that body as the Mining Section. The vote was not heavy, because most of the members hardly knew what was the best action to take under the circumstances. Only 64 votes were cast, but only one was against the amalgamation.

Twelve votes were cast by large mining companies—a most significant action, as by the rule of the National Safety Council these larger organizations will have to pay more than those that are smaller. Companies with over 10,000 employees pay $100 per year and those with only 100 escape with only $10 of yearly dues. This fact was plainly set forth when the vote was taken, so that everyone clearly understood the situation.

The vote of these large corporations in favor of union is an evidence that they are willing to pay the increased rates demanded by the National Safety Council. This shows a generous appreciation of their part in the work. Some corporations have been willing to avail themselves of the services of the A. M. S. A. without any payment whatsoever. They have not even taken out individual memberships at $3 a year for their general managers. Others have declared themselves willing to pay for the medals awarded but not for the expenses of the organization awarding the medals, despite the fact that the officials of the association were entirely unpaid.

It is probable that with the National Safety Council in charge the proposition will be put on a more solid basis and one more worthy of the excellence of the work performed and more readily appealing to public support.

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The Manager's Vacation Days

By Walt Mason

(Written expressly for "Coal Age.")

In summertime the weary clerks break loose from the accustomed works, and take a well-earned rest; the janitor lets duties skip, and packs his grip and takes a trip to some place east or west. And e'en the freckled office boy deserts his post, with shrieks of joy, and scampers to the woods; for it occurs to all who toil that when the days of August broil, vacations are the goods.

But there is one who oft remains on duty, wearing nerves and brains, while others have their fun; the boss, who needs a layoff most, is toiling, toiling at his post, as constant as the sun. It would be better far for him, it would renew his strength and vim, if he would quit the grind, if he would drop his business chores, and chase himself around outdoors, and leave his cares behind.

The time invested in a rest is time invested for the best, for men who always toil, do so at sacrifice of power; their nerves get frayed, their tempers sour and sorer than a boil. So for a little while forget the business with its care and fret, and be a youth once more; go fishing with a good long pole, take headers in the swimming-hole, slide down the cellar door.

A tonic it will prove to you; vitality it will renew, your grouch it will destroy; and when from woodlands picturesque you go back to your chair or desk, you'll find your work a joy. You have to take a rest at night, when in your bed you slumber tight, and snore some ragtime tunes; and if you knew not that repose, your usefulness full soon would close, your surname would be Prunes.

And if a little rest is good, a longer one, in field or wood, by grove or burbling stream, will help you as it helps your clerk, and brace you up and make your work no more a nightmare seem. So, Mr. Manager, be wise, get out and gambol 'neath the skies, and canter like a colt; get clear away from every care that brings the silver to your hair, from business jar and jolt. And take along to brook or glade the helpful paper of your trade, while you are resting there; thus you'll improve the leisure day, and drive all loneliness away, and have some truths to spare.

COMING MEETINGS

The United First-Aid Corps of the 4th district, Delaware, Lackawanna & Western R.R. Co.'s coal department, will hold its third annual first-aid contest at Harveys Lake, Penn., on Aug. 14, 1915. Lewis Richards, secretary, 212 East Green St., Nanticoke, Penn.

The National Commissary Managers' Association will hold its sixth annual convention at the Hotel Gibson, Cincinnati, Ohio, Aug. 24-26, 1915. Tracy D. Luccock, secretary, 801 Manhattan Bldg., Chicago, Ill.

The Somerset County Miners' First-Aid Meet will be held at Boswell, Penn., Sept. 4. The head of the local committee is F. W. Cunningham, Somerset, Penn.

American Institute of Mining Engineers will hold its 111th meeting at San Francisco, Calif., Sept. 16-18. Bradley Stoughton, secretary, 29 West 39th St., New York City.

The American Mining Congress will hold its 18th annual session at the Exposition Memorial Auditorium, San Francisco, Calif., Sept. 20-22, 1915. J. F. Callbreath, secretary, Majestic Bldg., Denver, Colo.

The United Mine Workers of America will hold its annual convention in St. Louis, Mo., beginning Jan. 17 and continuing for three weeks. William Green, secretary-treasurer, 1102-1109 Merchants National Bank Bldg., Indianapolis, Ind.

The Labor Situation

SYNOPSIS—The scale committee in the anthracite district No. 1 has demanded the 8-hr. day, recognition of the union, a 25-per cent. increase in all day and contract wage rates, regardless of change in length of day, and also large allowances for overtime and holiday-time work. The Ohio miners are partly on strike and partly idle, and nearly all are destitute. The South Wales agreement is accepted by the miners.

The following is the report of the scale committee of district No. 1 of the United Mine Workers of America to the biennial convention, meeting in Scranton, Penn. The wording has been slightly changed, the principal modification being the omission of the unmannerly words "we demand" with which each clause opens with monotonous bad taste. We had occasion some time ago to publish an article by Milton H. Fies condemning the lack of manners in the operators' notices published around mining plants and recommending a more friendly manner of address.

The miners have no cause for complaint. They are no less arbitrary in writing their requirements. It is sure that it was not necessary for the miners to put "we demand" 21 times in a short document. They could have made their statement just as satisfactorily with the expression entirely left out, as in the abridgment we publish.

Scranton, Penn., July 19, 1915.

To the delegates of the first biennial convention: We, your scale committee, having examined all requests for an improved contract, submit for your approval the following demands:

1. Recognition of our organization with the right to negotiate a wage contract and to provide a satisfactory method for the collection of revenue for the organization.

2. An 8-hr. day for all men and boys employed in or around any colliery with no reduction in pay.

A New Conciliation Board Demanded

3. The Conciliation Board shall be abolished and the following method substituted for the adjustment of disputes: The employees of each mine through their grievance committee may form a general grievance committee, and the said committee shall appoint a subcommittee. Its duty shall be to carry on negotiations with representatives of the organization and officials of the company and try to arrive at a satisfactory agreement on any dispute which affects the employees in general. It shall also act in disagreements between the mine committee and the company officials, regarding new work or changed conditions, etc. Any agreement made by the subcommittee shall be effective and binding, and shall apply to all the employees working for that company.

All such agreements shall be made in writing, and signed by the officials of the company, the subcommittee and the representatives of the organization in behalf of the employees.

In case the subcommittee and the officials of the organization and company officials fail to come to an agreement on the dispute involved, the officials of the organization are to choose one man not interested in the dispute to arbitrate it. He shall hear all evidence, after which he shall make his decision within 30 days after the time at which it was decided that the organization officials and the representatives of the company had failed to reach a decision.

The said decision shall be final and binding on both parties to the controversy. The expense incurred shall be equally divided between the coal company and the mine workers. The expenses of the latter shall be paid by the district treasurer out of the funds of the district where the dispute arises.

4. An advance of 25 per cent. shall be made on all the rates now paid for day work. An increase of 25 per cent. shall be granted all contract miners and laborers.

5. Not more than two laborers shall be permitted to work under the care of any one miner.

6. Coal shall be weighed on the run-of-mine basis, 2240 lb. constituting a ton.

7. A uniform day at not less than $4 per day shall be granted machine runners and $3.50 per day shall be the rate for helpers.

8. Men in charge of a timbering, rockwork, or other like gang shall be paid the consideration miners' rate; helper rates less than consideration of laborers' rate paid at the mines where this work is performed. [The real nature of this demand is not clear.]

9. The price of coal sold to employees shall not be increased during the life of the agreement. The price to be paid shall be specified when this contract is made.

10. Time and a half for all overtime and double time for Sunday work and holidays shall be conceded.

11. No employees shall be suspended or discharged until their suspension or dismissal has been considered. Such action shall be subject to revision similar to that accorded to any action under this contract.

12. A minimum rate for slate pickers shall be $1.25; any advance received under this agreement shall be added thereto.

13. The manner in which mining machines shall be used shall be properly regulated, and a scale of wage rates for machine mining shall be granted, which shall be adjusted to the various systems of handling machine coal now in use in the anthracite region.

14. The contract system shall be abolished in the anthracite region, and all contracts now in effect shall be declared null and void after the signing of the new agreement.

15. A minimum rate of $2.50 per 8-hr. day shall be paid to firemen, and the compensation to carpenters and blacksmiths shall be 47½c. per hr. To these rates should be added whatever general increase of wage other mine workers shall receive.

16. The next agreement shall be made for a period of two years.

Men Are To Be Paid for All the Props They Set

17. Payment shall be made for standing props on second mining.

18. Where three engineers are employed the third shall receive the same pay as the first two.

19. A payment of 10c. per ft. shall be made for the standing of all props on first mining.

20. Where the pitch does not exceed 30 deg., chambers shall not be driven more than 150 ft. long before being cut off by counter gangways. Where this cannot be done a payment of 20c. per car shall be made for the first 100 ft. from the platform, and 20c. extra shall be paid for every 50 ft. driven above the 50-ft. (?) mark. The same rule shall apply to buggy places.

21. No agreement shall be binding until first submitted to the local union for a referendum vote.

An Evident Expectation To Dicker Is Revealed

Despite the peremptory character of the demands, it is noticeable that there is a certain weakening about the wage concession, because a minimum is set for several workers and provision is made for these men receiving an equal increase with the other mine workers, whatever that may be.

There is, of course, no question but what the demand of the committee is merely a basis for dickering. The miners have not yet learned that they should ask for what they think they have a right to get and stick to it.

President John P. White is opposed to the recommendation which the scale committee has made relative to arbitration. He would like to see all matters brought before a single board for consideration, so that some uniformity would be obtained. He feels that otherwise local conditions may cause agreements to be made which will prejudice settlements in other districts where the conditions are slightly different.

The convention adopted a resolution which originated in local union No. 1649, which not only demands a fair compensation for machine mining, but charges that the operators have been driving the machine men to superhuman efforts in order that they might produce a large tonnage of coal which would serve to establish a basis which would be too high to be a fair criterion of what would constitute a day's work.

The miners, recognizing that there is a powerful press committee influencing the public in favor of the contentions of the operator, have decided to form a press bureau themselves. This committee will be named in each section and will distribute material to the papers and will provide matter for the "United Mine Worker's Journal."

Miners Object to Compensation Law

Not a little complaint was made at the convention about the Workmen's Compensation Law on the ground that a man who is injured so that he cannot work is not half but wholly incapacitated and should receive not merely half pay but 100 per cent. In fact, it is true, he has to meet, on the whole, expenses which make it necessary for him to receive more pay rather than less in order to live as well as before.

Though he has nothing to pay for oil, carbide and powder, he has to meet in some cases doctor's, nurse's and druggist's bills, although in many instances part of these, for a while at least, is provided by the monthly payment to the doctor. The argument on the opposing side is, of course, that the miner should coinsure, so that he will not be anxious to claim help from the industry after he is fit to go back to work. Some miners, like some richer men who have insurance, are not prone to go to work if they can make as much by sitting at home.

The attorney for the Pennsylvania miners, defending his work in securing the passage of the law, declared: "You have the grandest employers' liability law ever written because it destroys two of the old common-law defenses—the fellow-servant rule and that of assumption of risk, and modifies a third, contributory negligence." The miners desire old-age mothers' pensions in addition to a more generous workmen's compensation law.

"Mild Request" for Replacing of Wood Rails

The Delaware & Hudson Co. was severely criticized in the convention at different times by the Eddy Creek local at Oliphant and by the Peckville miners. But more serious because more general was the complaint about room trackage. The miners want the wooden tracks alleged to be used in chambers of that company replaced by "iron rails." Certainly the miners in this present day have a right to have steel tracks in their rooms.

There is no profit to any company in using wood rails, as they have a short life and warp so freely that numbers have to be thrown out. The frequent derailments in the rooms prevent certainty in operation and are the cause of much lost time in the haulageways. It is quite likely, therefore, that if conditions prove as stated the men will get what they desire, and they cannot be blamed for their urgency in making their complaints. The resolution with commendable restraint calls for a "mild request" for steel rails.

Among other matters considered was the pay of presidents, secretaries, treasurers and district-board members. It is expected that the president's salary will be raised from $1600 to $2000 a year, the secretary-treasurer's from $1300 to $1500 and the district-board members will receive $4 instead of $3.85 a day.

There has been some opposition to the use of buttons as visible receipts of union dues, as they can be handed around among the men in a boarding-house. It has been decided that the regular district button must be used or none at all. Local unions cannot provide their own distinctive buttons.

The convention rejected a plan to set aside a "lockout fund" for the benefit of those who were temporarily discharged by coal companies or made idle by the closing of mines. It was suggested that 3c. out of every monthly per capita tax be used to establish this fund. The miners hope, however, to make the operators pay for idleness caused in this way and will not establish a fund for that purpose.

To Avoid Something Analogous to Colonization

The election for district officers has been bitterly contested, and many have been the charges of fraud. It has been alleged that a West Scranton local union purposely increased its contribution to union funds so as to obtain an excessive vote. In order to block such possible dishonesty, the rule relating to elections was made to read: "The tellers shall not count the votes of any union that has cast more votes than the number of members for which such local paid per capita tax to the district union for the three months preceding that in which the election is held. The local union shall send notice, upon uniform sheets supplied by the district, of all new members initiated during these months."

It is alleged that the vote of Local 2444 was illegal because the union was in arrears, that Local 1635 turned in 167 votes, although only 9 members voted, while Local 1068, where only 8 members voted, was registered by the union solidly for the administration. Other examples quoted are these: Local 1001 cast 72 votes and the returns show 521. Local 957 cast 402 votes for Thomas Hilton as executive-board member and 6 for his opponent, Peter O'Donnell. The tellers' report neatly reversed the figures in O'Donnell's favor. The vote was close for this office, for O'Donnell received 6737 and Hilton 5842.

The Votes in District No. 1 Show Dempsey President

John T. Dempsey, of Scranton, is reëlected president with 20,666 votes, beating Thomas Morris, of Edwardsville, who received only 11,081. Joseph Yannis, of Pittston, who faced as many as five rivals, easily won as vice-president with only 12,232 votes. John M. Mack, with 21,246½ votes, beat his only rival, Enoch Williams, of Taylor, who polled only 996½ votes. He was running for the secretary-treasurership. Thomas Davis, of Nanticoke, again becomes international-board member, more than doubling, with his 20,737 votes, the vote given to his rival, George Brown, of Scranton.

John P. White is receiving an enthusiastic welcome in the anthracite region, though his success in securing members has yet to be proved. He has issued a striking statement on the recent financial record of the Delaware, Lackawanna & Western R.R. Co.'s Coal Department, which a few days ago declared a deferred dividend of 60 per cent.

He declares in his statement that dividends totaling 140 per cent. have been paid in 6 years, that on a capital stock of $5,590,000 dividends of $9,226,000 have been paid, "which gives to the stockholders the return of their original investment and $2,636,000 in addition. The stock is still theirs, and it is conceded by all that the holdings of the company, without considering the increased valuation accruing from the large dividends paid, has greatly increased in value. The fact is the Delaware, Lackawanna & Western has outdistanced all other operating companies in building for future opportunities."

As Mr. White here suggests, the Delaware, Lackawanna & Western R.R. Co.'s Coal Department has an advantage over nearly all the other coal companies, for their affairs are by no means so prosperous. He has taken the "Henry Ford" company of them all. But he does not stop at this point; he goes on to show what this means to each employee.

If the Lackawanna Dividends Had Gone to the Employees

There are 19,056 of these men, and if the surplus over 10 per cent. per annum had been paid them, each individual would have received $45.23 per year more, and each man or boy would have been paid 19c. more per day. All this could have been done without disturbing the surplus of $1,500,000. This 19c. per day, he declares, would have been a 10 per cent. increase were all classes lumped together as a unit.

This richest company is taken as a guide to show what all the companies could do. The mine workers, however, are not satisfied with 10 per cent., but desire 25 per cent. of an increase and also for the day men a decrease of time of 11 per cent. It is remarkable how the argument breaks down at this point.

Mr. White would have the poor educated as well as the rich, and pleads eloquently for it. That alone is not by any means impossible, but when poor and rich share alike no one will experience any great degree of affluence, for, as has been shown, the income above 10 per cent. of the best anthracite company would only give 19c. per day per man if divided and the whole income for 6 years not more than 33c. Dividends grow small when divided among the multitude.

But though John P. White makes a somewhat biased statement about the Delaware, Lackawanna & Western R.R. and other anthracite companies, he is not lacking in the gentle amenities of life. And in their turn the companies are not being ungenerous. At Edwardsville the Kingston Coal Co., one of the independents, without charge furnished the current and paid the electricians to wire the field when Mr. White came to that town to promote the interests of the union.

Are Not the Miners in Eastern Ohio Justified?

About 1000 miners are on strike in eastern Ohio, and there has been a disposition to blame them. The public remembers that within the last two years they have been on strike for 13 months and business has been so bad that only a few of them have gone back to work. On its face, this public disapproval seems to be merited, but the miners are not without reasonable excuse. In fact they are showing an excellent disposition in the matter.

Though it is not in the contract, the operators are said to have agreed that by July 22 they would install mine scales, so as to weigh the coal as it came from the mine. This gave them over 60 days to do the work for the contract dates from May 11. Only about 10 places out of 69 have made the necessary changes and some of the mines are said to have made no attempt to do so. This statement has been made of Pultney No. 1, Fort Pitt, the Webb, the Bakewell, the Neff and the Franklin mine. Scales are already installed at Rail & River No. 1, and they are being erected at Rail & River Nos. 2 and 6.

C. J. Albasin, the president of subdistrict No. 5, which covers eastern Ohio, declares that where attempts are being made to secure and install scales, the union is endeavoring to keep the men at work and is extending the time for the necessary changes. The operators claim the scale makers are unable to fill the orders promptly. The Lorain Coal & Dock Co.'s mine at Blaine, the Herrick mine of the United States Coal Co. at Rush Run and the Cambria Mining Co. at Bellaire are closed down as a result of the lack of facilities for weighing coal as it comes from the mine.

It is stated by C. J. Albasin that during the recent strike $1,654,450 was paid out by the union for food, clothing and medicine. Of course, the miners also received direct contributions, and their losses are by no means adequately represented by the sum expended in their relief.

But with the closing of the mines in the Hocking district a further accession has been made to the sorrows of the Ohio miners, and on July 22 Governor Willis made an appeal for help for those in both the eastern and southern ends of the coal region. The Adjutant General, B. W. Hough, will distribute the relief.

The miners are convinced that it is not so much the Green bill and the contract calling for payment for all coal mined, whether large or small, which are paralyzing the industry. In fact, when the Gallagher amendment to the Green bill was being pressed the miners urged that its passage would make little or no change in the condition of the business, whereas the Vorhies bill for fair railroad rates was the measure most greatly to be desired. They are now urging that some West Virginia coal is traveling 200 miles for a freight rate of 85c., while some Ohio coal goes one-quarter as far, 50 miles, for 5c. less. The railroads contend as a reason, though they can hardly claim it as a conclusive argument, that the West Virginia coal in the case cited is delivered to them in trainload lots at Armitage and, therefore, there is no extra expense in assembling the cars from the mines.

The United Mine Workers of America, District 6, which covers the Hocking Valley district, has made complaint about this discrimination to the State Utilities Commission through George B. Okey, its attorney. All the 39 railroads operating in Ohio are the defendants.

Tom Lewis to Be Operators' Representative

It is rumored that T. L. Lewis, the former president of the United Mine Workers of America, is likely to succeed John Zelenka as secretary of the Ohio Coal Operators' Association. T. L. Lewis has for some time published a coal paper at Bridgeport, Ohio. He has been extremely active in the eastern Ohio strike and has taken a position not unpleasing to the operators and consequently has more or less offended the miners. But he is a strong advocate of the union and his ability as a speaker and organizer is unquestioned.

The High Compensation Rates in West Virginia

The union miners in the Kanawha district are combining with the operators in opposition to the flat premium rate of $2.25 fixed on the coal industry of West Virginia by the Workmen's Compensation Law. The miners claim their share will be $1 per capita. They feel that the Kanawha district should not pay for the deficit caused by explosions in other districts. Carried to its conclusions, this argument would lead to each mine paying for its own explosions. The distribution of the burden through the industry is what assures certainty in the operation of the compensation law.

Attempts Are Made to Organize Eastern Kentucky

The miners of the Continental Coal Corporation and the new Bell Jellico Coal Co. have gone back to work at the same schedule of wages as prevailed when they walked out. The Continental Coal Corporation has agreed to restore the 10 per cent. deducted from the wage scale, on Oct. 1 or sooner if conditions warrant it. The company agrees to sell goods from the commissary on a 16 per cent. profit and to make certain repairs on the men's homes.

A local union was organized and an attempt will unquestionably be made to introduce the organization of the United Mine Workers of America into that unorganized field. At other mines the men are expecting to organize shortly, and the employees of the Coleman Mining Co. and the Pioneer Mining Co. in the Straight Creek field expect to demand recognition. But the lack of funds is likely at present to prevent successful organization, and the action will probably be delayed till a period of prosperity succeeds the present depression.

Amalgamation with Western Federation of Miners

Frank Farrington, president of District No. 12 of the United Mine Workers of America, announces that plans are being considered, as provided at the Indianapolis convention, for the amalgamation of the Western Federation of Miners with the United Mine Workers of America. Committees of the two organizations are to confer July 27 at Butte, Mont. The Western Federation of Miners is now opposed by a rival union at Butte, which is stronger than the Federation, and the latter organization has been discredited everywhere and to "wish on" the U. M. W. of A. such an "Old Man of the Sea" would be a most unkindly act.

The Courts May Act in the Bache-Denman Case

"Coal Age" is informed that in Arkansas the federal court did not dismiss the case of the Bache-Denman Coal Co., but merely sustained a demurrer, filed by the defendant. The company will amend its complaint and feels that as revised it meets all the points which were raised against the plaintiff company in the demurrer of the defendant.

South Wales Strike at an End

The strike in South Wales was definitely ended on Wednesday, July 21, when the miners agreed to the terms accepted by their leaders on the previous day. Lloyd George made a rousing speech to his friends, the miners, on the preceding day and asked the men to make up for the lost time by "extraordinary efforts."

All through the South Wales dispute the Federation of Miners of the United Kingdom has stood for peace and arbitration. It is not clear why the Federation showed more patriotism than the South Wales mine workers, but this is possibly due to several causes, among others the fact that the war has come more closely home to the dwellers in Yorkshire and the North country, and because the English are less sensitive under restraint than the Welsh. It is certain that in Wales the talk about the use of the strike to stop the war has been most rife, and it has had not a little to do with the present unrest.

But in no part of the country is there less cause for striking, unless indeed high pay acts as an incentive to do so. The South Wales miners have been receiving higher pay than the miners in other sections, for owing to the comparative newness of the South Wales field and the excellence of its product its advance has been rapid and prices have been high, and in a large degree the miners have participated.

Miners Felt They Had a Valid Grievance

The miners' wages had increased since July 1, 1914. At that time they were 60 per cent. above the base established in 1879. Just a year later they were 77½ per cent. above that base or had been raised 10.9 per cent. Probably the increase was no more than the increase in cost of living. Perhaps, also, where some of the wage earners were in the trenches, those that remained had a larger burden to sustain. From this point of view it is hard to deny that they had a grievance that an arbitration board, such as was proposed, would have recognized.

Moreover, while the miners' rate of wages had increased nearly 11 per cent., the operators are receiving a far larger percentage increase. On July 1, 1914, the price of best Welsh small steam coal, f.o.b. Cardiff, was $2.67 per ton. A year later it was selling for from $4.75 to $4.87, an increase of from 77 to 82 per cent. No. 3 Rhondda, lump, has risen from $4.25 to $6.80, a rise of 60 per cent. The operators are entitled to a slightly higher raise in price than the miners, because of the large increase in the cost of props; but it would have shown greater patriotism had they declared that no matter what others did they would raise their prices not one penny higher than was necessary to maintain their regular profits.

During an international war is no time to be trying to become rich at the expense of one's countrymen and allies. Had prices been unchanged wages might have been kept down to the ruling figure without any evidence of injustice. It is hard when declaring the South Wales miners unpatriotic not to extend that aspersion to the operators, who should have known better.

The government is preparing to limit profits to an even dollar above pre-bellum prices. That is an increase of from 25 to 30 per cent., hardly more than the miners will now receive under the new arrangement.

What the Operators Plead in Extension

It is true that the rise in the price of the coal reserved for Admiralty use has not been as large as that of other coal, still that price has risen from $5.10 and $5.22 to $6.56, a rise of from 26 to 29 per cent. Moreover, the operator urges that the rise in price has not persisted all through the war. The prices were hardly any higher when the year commenced than six months before, and business had not been by any means good.

The operators are but human and the prospect of a 25-per cent. income tax may have spurred them on to enlarge their profits; and to their credit be it said, there have been some other concerns which, like the ocean freighters, have increased their prices not 70 but 200 per cent.

Moreover it is only by profits that the large costs of the war can be met. What is made and spent is gone forever. The profits can be seized by the government by taxation and made to serve the nation, but the money paid as wages will be spread so thin over a large area that the tax collector will be grasping at thin air. In fact, the British have long since ceased to tax anything the poor man consumes except beer, whiskey, tobacco, tea, coffee and currants and the exchequer derives all its income from profits in the form of income tax.

The miners claim with truth that the profits in the Welsh coal trade have always been ample, and they feel that there is no excuse for such large advances as have been made since the war.

Editorials

New Head for Mining Bureau

It is generally accepted as a good policy in modern business to seek men for high positions from employees who have rendered faithful and efficient service in minor capacities. Everyone knows that a man will work with better heart when there is hope of reaching the top in his chosen line of endeavor. The knowledge that such a policy or principle of selection exists will bring the best talent to a corporation and will retain this talent through years of earnest effort. What applies to an industrial concern applies equally to a Government bureau.

The coal-mining fraternity, in fact mining men everywhere, are hoping that in selecting someone to succeed Dr. Holmes as director of the U. S. Bureau of Mines President Wilson will choose a man qualified by service in the bureau, or through long experience in mining engineering work elsewhere.

The coal and metal industries will support a new director whole-heartedly if the man chosen is selected for his evident ability to serve efficiently as head of the mining bureau. The work so ably started and carried on by Dr. Holmes will be severely crippled if political pull constitutes the essential qualification in the matter of selection.

Mining men are anxious and we trust current reports of an abhorrent choice are unfounded.

Recent Anthracite Decisions

The recent court decisions relating to the anthracite companies should bring a feeling of relief to all concerned, for the reasons that are outlined at greater length on another page of this issue of *Coal Age*. These companies have never been intentional violators of the law and were only acting under the statutes of the State of Pennsylvania. So their acts were valid enough until the state laws under which they had operated were rendered void by the passage of a national act.

These continued suits have aroused the feeling of the general public against the coal companies. Much of this feeling was not by any means spontaneous, but has been created by irresponsible parties pandering to the petty prejudices of people who allow others to think for them.

We may now hope that the coal companies can go forward and attend strictly to business and may be able to show a profit to their stockholders which will be commensurate with the capital invested. Some of the anthracite companies have made fair profits; in fact, the returns to some of them have been quite large, but it can be safely asserted that they nowhere approach those made in a dozen other business enterprises in this country which return large dividends year after year without any comment from the people.

It seems to be a weakness of human nature to decry the cost of vital necessities, whatever the price may be, yet a man can make a fortune in an amusement enterprise by the simple device of doubling the price, with only a gentle murmur on the part of the public, which continues its patronage and forgets. The consumers will make an automobile manufacturer a millionaire several times over and be actually greedy to purchase his product, the only question as to price being whether they have it or not.

Let us hope that a new day with at least 6 per cent. sunshine is dawning for the coal man. He has had so many trials and tribulations that it won't take much to make him happy and contented.

A Memorial for Dr. Holmes

It seems to be the unanimous opinion of the personal friends of Dr. Holmes, late director of the U. S. Bureau of Mines, that there should be some permanent memorial for a man so big of heart, so earnest and efficient as he was. At a recent gathering of a large number of his friends two plans were suggested which seemed to meet general approval. The first was the erection of an appropriate monument at the grave in Rock Creek Cemetery, Washington; the second plan was that a memorial volume should be printed, the book to contain a sketch of Dr. Holmes' life, views of his work by a number of selected persons, resolutions of various societies and associations, and finally a number of writings and addresses by Dr. Holmes himself.

There is no doubt but that either of these plans would be widely supported by the great army of workers in the mining and metallurgical industries. Few men, especially in the coal mines, but have felt the beneficial effects of the work carried on by the Federal mining bureau since its inauguration under the direction of Dr. Holmes. All of these men would gladly contribute the small amounts needed from each individual for either of the memorials above referred to.

Coal Age would greatly appreciate expressions of opinion on this matter from those of its readers who have numbered themselves among the host of coal-mining people who have at one time or another associated or coöperated with Dr. Holmes in the advancement of the important work he undertook. Such suggestions as we receive are not necessarily intended for publication, but for the guidance of those of Dr. Holmes' friends who will assume the responsibility and initiate the movement for a fitting memorial to honor the man and perpetuate his work.

The United Mine Workers

The plea of Mr. Archbald for the recognition of the union in last week's issue has of course the right ring. It does seem right that the men should be represented, and because some of the leaders are irresponsible seems an inadequate reason for condemning the whole union.

But the operator who has no organization to take exception to his every move is naturally disposed to avoid raising such a spirit of unrest, for he knows that the genii of the bottle when freed is quite as apt to be unreasonable as to be fair. He may feel admirably friendly to all the purposes of the union and yet be greatly disinclined to risk the peace around his mine by permitting the establishment of the union.

He argues: "The men say I have frailties against which they must be protected. I probably have them, but so have they, and it is best for me to run my own business." And he is surely not wrong in viewing several of the miners' leaders, especially in grievance committees, as the very epitome of revolt.

It is strange how fortunate the union has been in its national leaders and how unfortunate it has been in selecting its more local officers. One would expect that the national leaders, being selected by men who cannot know them, would be chosen without judgment and would be entirely unworthy of their places of honor. On the other hand, the grievance committee, which is well known to all the voters, should represent the real spirit of the men and be composed of the most rational fellows. But that is rarely the case. The bigger leaders are more responsible than those in places of local prominence and are in most cases men of solid worth. But your grievance committee is ever a standing offense.

The same is true in the affairs of our country. We have good reason to be proud of our Presidents, but our state officers and city aldermen are often a burden grievous to be borne.

The U. M. W. of A. is not without its excellent qualities. Some one might without sophistry write a panegyric on its solidarity. It has steadily refused to make any choice between the various classes in its membership. Roadmen and miners, carpenters and motormen, doorboys and timbermen are alike recipients of its solicitude. Nor does it allow squabbles between them. The miner who is called off to put up a brattice is not reprimanded because he takes the place of an absent carpenter; the carpenter who sets a prop for a doorway does not start a strike of timbermen; the miner who bails a little water does not find himself scolded by the pumper. There is nothing in mining like the squabbles among the house builders or the fusses recently disturbing the Remington arms plant.

The union once well established is better than when partly organized. The first men who join are the soreheads whom nothing suits, who do not believe in the present order of things; many are of the belief that they should not have to work for a living. They are men who like to lead, and trouble is in the wind.

It is not strange then that when the companies are once committed to a 50-per cent. union they change their views. They want to deal with all their workingmen not with the soreheads only. They desire to meet a consensus, not a travesty, of opinion, and they begin to look forward to a time when every man will be in the union, when every man will attend meetings and vote and when the vote will go to the best man. They have the same ideals as should animate our political life.

The best thing about Mr. Archbald's article is the reference to the need for the open discussion of every labor problem. Some day the operator will be permitted to meet the union in council and argue his case. He will have a chance to face his men and tell his story. The future will find us all knowing something of the arguments of the other side and basing our attitude upon them. The miner and the operator now plot darkly and in silence, and they come together only in clashes.

The miners' leaders have been talking loudly about the present war. It is, they say, a crime of the chancelleries, and in some ways they may be right. But why do not the miners themselves abolish their chancelleries? Why do they deny the operator the right to state his arguments in union meetings? Why must he always meet only their leaders, their chancellors, and not the men themselves?

Perhaps, as has been said in condemning statesmen, the miners' leaders are partly right. If the *people* could have met and talked the matter over man to man the war would perhaps have never happened, and probably if the same had been done in disputes between employer and employee many a strike war would have been averted. But the military men in the one case and the labor leaders in the other would have been disappointed and their trade would have been ignored.

The popular will would have been supreme and the men would not have blindly followed courses which appealed to them merely because they never had heard the opposing point of view. When also the leaders no longer fear the whole truth the *United Mine Workers' Journal* will no longer be the painfully newsless and unfair sheet it now is, but will let real light in on the causes of conflict and paint a real picture in which all is not shadow.

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When Opportunity Knocks

All of us have been told from the time of our early childhood that Opportunity knocks at every man's door at some time or other and that each individual must be ever alert and responsive to the call. The coal industry is a business of great magnitude. Several thousand intelligent and experienced men are required to fill the important positions connected with the production of coal. Right now a number of large operating companies are searching for men who are qualified to fill positions of trust and responsibility.

A few days ago the manager of one of the largest bituminous operations in America asked us to recommend a man qualified to report on a peculiar problem that arose in connection with the operation of one of its mines. We remembered that a certain superintendent had recently prepared a paper covering in a general way the problem that confronted the bituminous operator above mentioned. There was a quick exchange of telegrams, and the author of the article was engaged to investigate the conditions and report a remedy.

This case is not an isolated one, for similar requests come to us at frequent intervals. What we want to emphasize is the desirability and advisability of mining men writing detailed accounts of their experiences, for it is only through such dissemination of practical information that great advances in the art of mining can be brought about. There is no doubt that what benefits the coal industry as a whole benefits also every individual engaged therein. It is likewise true that the greatest reputations attained by mining men have had their beginning founded on early literary efforts, which have brought them more than a purely local renown and focused attention on their practical sense, experience and ability.

Sociological Department

Kansas City First-Aid Contest

SYNOPSIS—A meet of first-aid workers at Kansas City, Mo., in which the miners from five states and their union were the chief factors, was held on July 10. The winning team, which is that from Lehigh, Okla., will go to San Francisco to represent Oklahoma, Kansas, Iowa, Missouri, Arkansas and Texas. The good work of the mining teams has started the first-aid movement in factories and in the police department of Kansas City.

One of the bright spots in the character of Dr. J. A. Holmes, the recently deceased chief of the Bureau of Mines, was the breadth with which he discerned that the first-aid movement is not an interest solely of the operator and of the men he might delegate, but of all workingmen, individually and in association. As a result of his work and that of his associates —one of whom, W. D. Ryan, is a former labor leader—the miners and the union have taken up first-aid training and contests and in many places are doing the work as their own, but with the friendly coöperation of the operators.

This is emphatically constructive unionism and demonstrates the fact that the union is organized for the welfare of the miner rather than for the perdition of the operator.

A first-aid contest and mine-rescue demonstration was held at Kansas City, Mo., July 10, under the patronage of the Public Safety Commercial Club of Kansas City, the Southwestern Interstate Coal Operators Association, the United Mine Workers of America and the United States Bureau of Mines.

The meet was held in the convention hall at 8 p.m., and about 2500 persons attended. Perhaps no meet of this sort outside Pittsburgh has been witnessed by so many people.

The committee on arrangements included also E. M. Clendening, secretary of the Kansas City Commercial Club; M. F. Ryan, president of the Brotherhood of Carmen; John T. Smith, business agent of the Industrial Council of Kansas City, Mo., who also represented the Missouri branch of the American Federation of Labor, and E. R. Sweeney, vice-president and general manager of the Gray-Bryan-Sweeney Coal Co., a member of the operators' association and also an active member of the Commercial Club.

The doctors who examined the dressings and action of the teams were C. C. Nesselrode from Kansas City, Kan., across the Kansas River; B. H. Zwart, P. F. Bohn, M. J. Owens, R. M. Meade, R. M. Schauffler, Logan Clendening and F. J. Ridge, all of Kansas City, Mo.

Many Labor Leaders Present

To show the general interest in the meet a list of those participating from outside the city may well be recited: George McBride, state labor commissioner of Kansas from Topeka, Kan.; P. H. Waterman, vice-president of the Iowa Coal Operators Association; W. H. Rogers, president, and John Gray, secretary, of the United Mine Workers of Iowa; George Hill, chief inspector of Missouri; Grant Parker, president, and George Heppel, secretary, of the United Mine Workers of Missouri; A. W. Dickenson, superintendent of the Central Coal & Coke Co.; Joseph Fletcher, general manager of the Cherokee & Pittsburgh Coal Mining Co., of Pittsburg, Kan., and vice-president of the American Mine Safety Association; John Pellegrino, mine inspector of Kansas; Bernard Harrigan, president of the United Mine Workers of Kansas; George Richardson, assistant commissioner of the Coal Operators Association of Kansas, and D. C. McAlpine, of Lehigh, Okla. The large number of labor leaders present may be noted with satisfaction.

The event was primarily a contest in first-aid work among teams from five states—Arkansas, Iowa, Kansas, Missouri and Oklahoma. The winning team was to be awarded the honor of representing the district at a contest in San Francisco. When it was proposed to hold the meet in Kansas City members of the operators' association who were also members of the Commercial Club realized that the coöperation of that institution would assist the safety-first movement and give wider publicity to the first-aid work now being done at mines.

How Funds for Contest Were Raised

The project was put in the hands of the Public Safety Committee of the club, and W. T. Grant, who is secretary of the Business Men's Accident Association of America, was made general chairman. The committee sold the manufacturers about 100 boxes in the convention hall and thus raised funds for the event. The manufacturers either used the box seats themselves or gave them to employees. About 10,000 tickets of admission were distributed by the committee among industrial employers, chiefly as formal notices of the meeting. General admission, however, was free.

About 2500 spectators attended the meet, though the night was hot and the general inclination was naturally to seek the parks and to stay outdoors. In the audience there were about as many women as men, and a large number of boys. It was notable that most of the men from industrial plants brought their wives and sons, and many their daughters also. The presence of the women and children was welcomed, as by their efforts safety-first and first-aid propaganda can be made to grow most rapidly.

Manufacturers Follow Lead of Miners

By special invitation the fire department of the city was also liberally represented. It had been specially announced that while the miners would demonstrate first-aid work as conducted at mines, the procedure would be similar to that in force at industrial plants and, indeed, wherever accidents occur.

As the object of the event was partly the promotion of safety-first propaganda, a few short speeches were made before the contest commenced. W. T. Grant, who introduced the speakers, reviewed the efforts made by large corporations to prevent accidents. He called attention to the large financial savings thereby accruing and to the loss of efficiency resulting from losing the services of men injured. He showed that the employed gained even more by saving their limbs and fingers, and even their lives in some instances.

Mayor Henry Jost of Kansas City declared that cities should be as careful to protect the citizens from accidents and from the ill effects of poorly treated injuries as it is to assure them safety from disease and rapid recovery from infection. These latter needs are now supplied by the work of boards of health, and in time we will learn to have an equal municipal regard for defense against accidents and their sequelæ. Senator James A. Reed declared that the police of the city could well go to school to the miners. Though the miners are the better trained, no one is called so often to the scene of an accident as the policeman, and he is usually as little prepared to give first-aid treatment as the ordinary citizen.

Rabid Remarks on Negligence

Senator Reed urged, with little reason, that one outcome of the present movement would probably be the establishment of the principle that an employer who allowed conditions under which fatal accident resulted would be regarded as guilty of criminal homicide. There is once in a while a demand that negligence shall be treated as severely as intention, but the public will continue to have more sense than such hotheaded law makers. No one is going to hang a miner for failing to close a door, much less an employer for having failed to see that some other miner or other employee closed it.

The miners, coal operators and others who promoted the event may be congratulated on the probable immediate outcome of the event, for a branch of the National Safety Council is to be organized in Kansas City, which will begin work with the eager coöperation of a majority of the manufacturers and men.

The contest was divided as usual into events for one and two men and for teams. The result, scoring by the table approved by the American Mine Safety Association, was as follows:

Oklahoma team from Lehigh, Okla., 888; Kansas team from Frontenac, Kan., 883; Iowa team from Hocking, Iowa, 843; Missouri team from Bevier, Mo., 823; Arkansas team from Calhoun, Okla., 822. A sixth team, of men appointed from among the visitors in the hall when the contest opened, took the place of the Texas team from Thurber, Tex., that did not appear. It scored 824.

Dangers of Mine in Dumb Show

Following the contest a demonstration of actual rescue work was staged. At one end of the hall a shed was erected about 5 ft. high, having low windows under the eaves except for about 12 ft. at one end. This represented a miniature mine. Inspectors examined the workings and reported gas in one chamber. There was a drunken miner with a pipe, an altercation, an entrance of the gas which filled the chamber and an explosion that filled the hall with smoke. A miner was projected through the tar-paper walls, apparently unconscious. The rescue teams rushed to the mine, and an automobile, filled with miners wearing breathing apparatus, dashed quickly into the hall. These rescuers dragged out the men caught in the explosion.

The rescue car from Pittsburg, Kan., No. 4, had been stationed for several days on a downtown switch track, and was visited by several thousand persons. After the meet this car returned to Pittsburg.

Meeting of Utah Fuel Co. Officials

At a recent meeting of the superintendents of the Utah Fuel Co. the subject considered was the education of foreigners. As the matter discussed was not of a technical nature but one of wide human interest, the meeting was largely an open one; consequently not only the superintendents, but the engineers, railroad men, mechanics, a veterinary surgeon and several mine and outside foremen, 18 in all, were invited and were present.

For the benefit of the visitors it was explained that the company had just made arrangements with the public schools in its various mining camps to give instruction in the rudiments of English, in American citizenship, sanitation and mining methods to all foreigners lacking a knowledge of the English language and American customs. The courses of instruction will follow closely those employed by similar institutions in the East, and motion pictures will be employed to illustrate the matters under consideration.

The need for this work is apparent to all those in charge of workmen; for of the more than 2000 men employed by the Utah Fuel Co., only 31.3 per cent. speak English, including Americans, white and colored, and British. Germans, Finns, Swedes, Austrians, French, Italians, Greeks, Japanese and Mexicans comprise the remainder, or 68.7 per cent. of the total. Of these 89.4 per cent. are Austrians, Italians and Greeks. A large percentage of these men can neither read nor write English, and understand it but little when it is spoken. They come to the mines with no knowledge of coal mining.

Many of these men, especially the middle-aged, have come to America solely with the intention of working just long and hard enough to save sufficient money to permit them to return to the homeland and live in comparative comfort for the remainder of their lives. It was the opinion of the meeting that there was only a small chance to educate such men and change their standards of life.

However, as a matter of safety for the majority of men in the mines, and as a means of rendering the work of the various foremen in charge of them less burdensome, the members of the council thought that no non-English-speaking man should be employed unless he would agree to take the course of instruction.

It was thought that the work should be concentrated largely on the young and ambitious and those who come to America as the land of promise and equal opportunities, for it was felt that greater success could be achieved with them. It was the consensus of opinion that special efforts should be made to instruct men in the fundamentals of mining and in methods of taking care of themselves and making their working places safe. The engineers in the meeting, speaking true to form, suggested that men be instructed how to obtain the greatest and best results with the least expenditure of labor and material.

It was recalled that when times were good and labor scarce great numbers of foreigners were employed, many of whom were not only ignorant of the way to mine coal but could scarcely make intelligible signs. Imagine the work of the poor foreman who had to maintain the output with such men.

Formerly all the drivers were Americans or British; now a large percentage are foreigners who, in their own countries, have had little or nothing to do with horses and mules. Many such regard an animal as merely a piece of mechanism entirely devoid of feeling, and treat it as such. As an example of the ignorance of the pulling capacity of a horse may be cited an instance related by the veterinary surgeon of the fuel company.

Two foreigners had hitched a horse to 12 large mine cars, each weighing when empty 2450 lb. In each of these cars was about a ton of grain. Two of the wagons were off the track and all were on an up grade, yet these men could not understand why the horse could not pull the load and abused it accordingly. The company has splendid animals, costing much money, and it takes pride in them. If by teaching men to understand English they can then be taught the care and abilities of a horse or mule, much would be accomplished.

While the details of this educational campaign are not all elaborated, it was the opinion of the meeting that it would be best to give an elementary course in reading and writing first and as the students become able to understand English to instruct them in mining methods, safety, etc. The public-school principals will be given authority to decide whether the men by their neatness and cleanliness are fit to enter the classes. It is hoped that in this way the desire for cleaner and more sanitary living quarters will be developed.

College of Mines, University of Washington

The annual short session for mining-men at the University of Washington recently closed its eighteenth year. In many respects it was the most successful in years, 38 students having registered for the work, 2 of whom were women. Of the entire registration 30 remained for practically the entire period. Quartz-mining subjects appealed to the greater number, with placer-mining next in interest. The oldest student was 52 years old, the youngest 19. Eleven of the men had previously attended some college and 3 were graduates. Most of the remaining students came with ordinary school preparation. Washington, British Columbia and Alaska were given as the addresses for most of those attending. Three students had previously attended the short session and returned for special work. Next year the nineteenth session will begin on Jan. 3 and will run for three months.

Discussion by Readers

Effect of Head on Pump Motor

Some time since there appeared in *Coal Age* (Vol. 7, p. 178) an inquiry by Richard Todhunter, asking what will be the effect on the motor driving a centrifugal pump if the head is reduced from 150 ft. to 75 ft. while the motor is operated at the same speed. The answer given at that time by some pump engineers was to the effect that under the reduced head a much larger quantity of water would pass through the pump, which would result in overloading the motive power, unless the pump was particularly designed to avoid this effect.

Later, H. D. Roberts opposed this opinion of the pump engineers, stating (*Coal Age,* p. 304) that he thought they were in error in saying that the motive power would be overloaded. Mr. Roberts presented some good figures to support his contention; but, in my opinion, the answer given by the pump engineers is correct. I will cite an instance that occurred under similar conditions, in my own experience, which proves the engineers' theory.

Our company had a double-gage, Weinman centrifugal pump, driven by a 40-hp. motor and discharging about 400 gal. of water per minute through a 4-in. discharge pipe. The pipe line was 1500 ft. long and had a vertical rise of about 10 ft. The pump was making 1100 r.p.m. under these conditions. As this arrangement was unsatisfactory in a wet season, it was decided to drive a ditch that would afford natural drainage. When the ditch had reached a certain point, I concluded to cut the pipe line and permit the water to flow into the ditch at that point. By this means the pipe line was shortened 600 ft. and the 10-ft. rise or head practically eliminated. I estimated that I could save power by doing this and use the extra pipe for the other pump.

At this time, however, my troubles began. The result of cutting the pipe line at the point mentioned was to cause a continual sparking on the commutator. We replaced the carbon brushes with soft graphite brushes; but that did not overcome the trouble. I then decided that, inasmuch as I had reduced the work of the pump nearly one-half, I should also reduce its speed, which could be done, as the pump was belt-driven. I took the matter up with the chief electrician and it was decided to use a smaller pulley on the motor, which would reduce the speed of the pump from 1100 to 920 r.p.m. This completely overcame the trouble.

In the course of time the ditch was completed and, as there was no longer any use for the pump at that place, it was moved to another location to take the place of two other pumps that were not doing satisfactory work. In moving the pump the small drive-pulley was damaged and we had to resort to the larger pulley formerly used for driving the pump. The result was that in two days the armature of the motor burned out. We put in another armature and bought another small pulley, after doing which there was no further trouble. In its new location the pump is discharging through a pipe line 1000 ft. long and having a lift of about 8 ft. This experience convinced me that when the lift of the pump is reduced one-half and the pump run at the same speed, the motor will be overloaded, as stated by the pump engineers.

PETER DRINNAN,
Mine Foreman.
Mannering, W. Va.

* * *

Longwall vs. Room-and-Pillar Mining

Letter No. 2—I am a great believer in the longwall method of mining, and would like to render my decision in respect to the relative merits of this method as compared with that known as the room-and-pillar system of mining. I read carefully the arguments on the two sides of this question, as presented by Fred Morck, *Coal Age,* July 10, p. 60.

I want to say, in the first place, that the longwall method is the most improved and uptodate system of mining coal in use at the present time, as it gives a larger extraction of coal, greater safety to the men and better ventilation of the mine, which reduces the risk of an explosion occurring to a minimum. Can the advocates of the room-and-pillar system claim for a moment that they are following the motto, "Safety the first consideration"? They must acknowledge that nothing is more dangerous in the mining of coal than the poor ventilation of the working face that is so general in the room-and-pillar system, especially after the rooms have advanced beyond one or two breakthroughs.

We have only to look back in the records to find that all the large explosions, costing many lives and destroying much property, have occurred in mines worked on the room-and-pillar system. I do not think there is any record of an explosion occurring in a longwall mine. This fact alone should be a great argument in favor of that system of mining.

Again, it must be acknowledged that there is a great waste of coal that cannot be recovered when the mine is worked on the room-and-pillar system. In many localities where that system is used, not more than 50 or 60 per cent. of the coal is taken out, the remainder being left in the pillars. While I freely admit that it is possible to work any seam of coal on the room-and-pillar system, I claim that system cannot be worked economically and the mine be made to pay in many cases.

There is another important item in favor of the longwall system, and that is the facilities it affords for the cheap transportation of the coal from the face to the shaft bottom. I mean that the roads are more direct, leading to all points of the working face in every longwall mine. I consider that these advantages are of the utmost importance in the mining of coal and show that the longwall method is safer, healthier and more economical than any other system of mining.

G. R. WADDELL.
Moundsville, W. Va.

The Mine-Car Question

Letter No. 5—In an article published in *Coal Age,* May 1, p. 752, R. Z. Virgin suggests that the present tendency to use mine cars of large capacity, and consequently heavy weight, together with the increase of weight due to various alleged improvements, may be unwise, since these all tend to increase the first cost as well as the cost of maintenance of both cars and trackage, to say nothing of the increased cost of operation.

Mr. Virgin suggests that, owing to the increase in dead weight of mine cars without a corresponding increase in capacity, there may result a reversion to the old style, lighter weight and smaller capacity of the car. He states that certain cars of 2 tons' capacity, weighing formerly 1800 lb., now weigh from 2800 to 3500 lb., which is certainly a disproportionate increase and, I should say, shows poor design.

I believe there is a practical limit to the size of mine cars, and a point where refinements increase instead of decrease the cost of underground haulage. When one reflects that transporting the coal from the place where it is mined to the surface where it is loaded for shipment constitutes the greatest factor in coal-mining economy, the design of cars that will give the maximum of efficiency deserves the most careful attention.

In my opinion the selection of the type and size of car best adapted to given conditions does not permit of a wide choice, but is limited by local considerations. Too often it has happened that the mine car in use is a development of an original type that someone thought best served the purpose, and changes were made from time to time, as dictated by experience. This has established a certain "standard" type, which was duplicated whenever new cars were added to the equipment of the mine.

In the study of the dimensions of the car best suited to existing conditions, the following items should be carefully considered:

1. Thickness of coal seam, as influencing the height of the car.
2. Nature of top and bottom of seam, as necessitating the driving of more or less narrow entries and thus influencing the width of the car.
3. A soft bottom having a tendency to heave may make it wise to reduce the height of the car so as to require less headroom in entries that may be affected by a squeeze.
4. The dimensions of the hoisting shaft that may limit either the length or width of the car, or both.
5. The gage of the track, as influencing the width of the car.
6. The loading of the cars at the working face, as influencing the height and style of the car.

The following conditions should be carefully considered in deciding on the capacity of the mine cars:

1. Where the coal is mined on a basis of screened coal—that is to say, where the operators' and miners' agreement provides for payment at a stipulated rate for all coal passing over a 1¼-in. bar-screen, 6 ft. wide and 12 ft. long, it is not possible to effectively screen more than two tons of coal dumped rapidly from the usual automatic dump-cage.
2. When operating on the mine-run basis, the only consideration affecting the capacity of mine cars is the ease of moving the cars, especially the handling of the cars by the miner in his working place. This question can only be decided after carefully studying the local conditions in respect to the grades of the haulage roads, the ease with which cars can be handled at the face, and whether mules or locomotives are used for gathering the cars. At the best, mine tracks are not surfaced or aligned like railroad tracks and are frequently subject to short heavy grades, which would forbid the use of cars of large capacity. It must be remembered that derailments are liable to occur at frequent intervals, and will cause much delay, unless the car can be quickly replaced on the track. These considerations call for the correct judgment of local conditions.

While it is true that the use of heavier cars calls for heavier locomotives and rails and better tracks, this fact can hardly be construed as a criticism of their use if transportation facilities are thereby improved, resulting in speedier trips, fewer wrecks and less power consumption per ton-mile, which all operate to produce cheaper coal, or reduce the cost of production. As the capacity of the mine car is increased the ratio of dead load to live load is lessened. It must be remembered that practically the same time is consumed for gathering the mine cars and hauling them to the surface whether the cars have a capacity of two tons or four tons each. Likewise, the operations of coupling, spragging, trapping, caging, hoisting and dumping are practically the same without regard to the capacity of the car. With these considerations in mind, it is difficult to see how a light car of small capacity possesses any advantage over a car of larger capacity, although the latter is heavier and requires heavier equipment generally, provided the conditions permit the use of cars of such capacity.

Mr. Virgin raises the question of whether the loader shares the benefit derived from the use of cars of large capacity. The answer to this question is that if the ratio of dead weight to live load is properly proportioned, the loader shares with the operator in the increased output afforded by cars of larger capacity. There is, besides, less chance of his being unable to load the coal mined, for lack of sufficient cars. The larger cars thus afford the miner a chance to increase his earnings, and incidentally attract to the mine a better class of loaders who are looking for places where they can earn more than an average wage.

Having decided on the capacity of the car that should be adopted in a given mine in accordance with the foregoing suggestions, the dimensions of the car must be worked out similar to that described in *Coal Age,* May 22, p. 904. The cross-section of the car must be determined first, the width of the bottom being made 6 in. less than the track gage when 1½ in. lumber is used. The height of the bottom portion of the car should be just sufficient to permit the flare-board to clear the wheels, allowing room for the cage-keeper, if in use, above the wheel. It is important to keep this height of the lower portion of the car as small as possible. It is determined by the half-diameter of the wheel, the thickness of the lumber used and the sizes of the axles and bearings.

The flare-board is often laid flatter than a 45-deg. angle, so as to increase the width of the car as rapidly as possible above the wheels. The support of this flare-board naturally is more difficult, as its inclination is flatter. A pitch of one vertical to four horizontal is not uncommon, and the width of the board often reaches 15 or 16 in. This must all be determined, however, in connection with the limiting width of the car.

The next step is to determine the height of the top-rail of the car above the track, or the depth of the car above the top of the flare-board. This, together with the amount of "topping" permitted, is limited by the maximum headroom allowed. Regard must also be had to the convenience of loading the car at the working face. My experience is that 44 in. is about the maximum desirable height of the top-rail of the car above the track, to permit of easy shoveling.

Having worked out the dimensions of the cross-section of the car and calculated its area, the inside length of the car is obtained by dividing the necessary cubical capacity (allowing, say 40 cu.ft. per ton of mine-run coal) by the sectional area in square feet. To the length so obtained must be added a sufficient allowance for the thickness of the end-boards and bumpers at each end of the car. It may happen that the results obtained will exceed the permissible length of the cars, as determined by certain limiting local conditions. In that case it will be necessary to alter the sectional dimensions sufficiently to give the desired length, or reduce the capacity of the car.

The size of wheel to be used will depend mostly on the weight of the loaded car. Larger wheels are easier-running and wear longer than wheels of less diameter. The width of the wheel through the hub should be sufficient to furnish a wide bearing on the axle, which should be symmetrical with the tread of the wheel on the rail.

Both square and round axles are in general use. The square axle is strapped directly to the car bottom, which construction is more easily maintained than the round axle running in boxes attached to the car bottom. The latter, however, permits a more uniform distribution of the load on the axle and produces a more uniform wear of the bearings than is possible in the use of square axles, where the weight rests on the journals at the ends of the axles. Channel-iron, plates and bars of special form are frequently used to maintain the boxes in proper position and alignment. The size of the axle may be calculated by considering it as a beam uniformly loaded and supported at its two ends, allowing an ultimate strength of 100,000 lb. per sq.in. for axle-steel and using 8 as a factor of safety.

The wheelbase of mine cars is necessarily small in order to facilitate the replacing of the car on the track when derailed. A short wheelbase also permits the use of curves of shorter radius. Approximately ¼ the length of the body of the car may be taken as the necessary wheelbase.

The track gage is usually determined by local conditions, present practice using wider gages than were formerly employed, which marks a general improvement in haulage equipment. Mine track gages of 36, 40, 42 and 48 in. are in common use. Car bumpers should be long enough to prevent the corners of the cars coming together on the sharpest curve allowed in the mine. The bumpers should be thick enough to prevent their riding each other. Couplings should be long enough to avoid cramping the bumpers on sharp curves.

The number and size of body irons depend on the size of the car; but irons of good thickness are economical, as the corrosive action of mine water wears them away. In my opinion, a reasonable increase in the weight of a mine car, caused by a suitable reinforcement that tends to prolong the life of the car and keep it out of the repair shop, and prevent the frequent occurrence of wrecks resulting in much delay and loss of output, is always well justified and desirable. These practical considerations are of even greater importance than the restriction of the ratio of dead weight to live load.

I have thus attempted to present in a general way what appeals to me as the more important considerations affecting the design of mine cars. My conclusions are based on my personal observation and experience in the design and use of such cars and a judgment that has led me to argue for a reasonably big car built for long service. While I realize that others, like Mr. Virgin, may take the contrary view, I feel that the subject is one of great practical importance, and I hope to see it thoroughly discussed.

W. E. Buss.

Harrisburg, Ill.

Mining Laws and Legislation

Letter No. 6—Referring to Mr. Hogarth's letter, No. 4, *Coal Age*, June 5, p. 988, in which he attempts to prove that the assistant mine foreman is a legally responsible official under the bituminous mine law of Pennsylvania, I want to ask him to point out the section of the law under which the assistant mine foreman can be held responsible for any of his acts in an official capacity. I have stated in a previous letter that by the phraseology of the law the assistant mine foreman is an irresponsible party. This statement is based not on opinion but on facts, confirmed by the reading of the law.

The bituminous mine law distinctly states that the assistant foreman shall act under the instructions of the mine foreman. This statement does not necessarily imply that the assistant must receive detailed instructions from his foreman relative to the work of each shift. To assume such a meaning would be to frustrate the purpose of this provision of the law, since the mine foreman would then have personally to inspect the entire mine so as to be able to direct the work in each section intelligently. The law provides the assistant to relieve the mine foreman of this burden. I understand, however, the intention of the law to be that the assistant shall have the authority of a mine foreman in his particular section of the mine, with the sanction and consent of the mine foreman, who is the responsible party.

I presume that Mr. Hogarth, as a citizen of the United States, knows that when an individual is elected as a representative either to a State Assembly or to a Federal Congress he is immune from arrest by the civil authorities, except for certain specific crimes. The reason for this is that the law recognizes such a representative not as an individual but as impersonating a constituency. The law regards that his actions during his term of office are virtually the actions of his constituents.

I would ask, again, why does a mine inspector make his recommendation to the mine foreman and not to the assistant foreman? The reason is plain—because the law permits him to hold only one individual responsible.

I believe Mr. Hogarth is in error when he states that "the mine foreman is responsible only for the orders given to his assistant, and the assistant for the faithful performance of the same." If this is true, the foreman's responsibility is limited to his issuing correct orders and the assistant's responsibility to the degree of faithfulness with which these orders are carried out. In my opinion, such a conception applies only to specific orders or instructions given by the foreman to his assistant. It appears to me that if the application were general, all responsibility would be shifted from the shoulders of the mine foreman to those of his assistant and the foreman would be free.

When a mine foreman gives a specific order to his assistant and an accident occurs as the result of the assistant's carrying out such an order, the responsibility for the accident is undoubtedly the mine foreman's; but Mr. Hogarth would have us believe that if an accident occurs under the direction of the assistant foreman when no specific orders have been given, the responsibility rests on the assistant and not upon the foreman. I do not regard this as the meaning of the law.

When Mr. Hogarth states that the mine foreman can be held responsible only for the orders he issues and for the employment of those whom he believes to be competent men to act as his assistants, he practically admits that the responsibility for the assistant foreman's official acts rests upon the foreman, inasmuch as he is made responsible for employing a competent man.

In reply to the insinuation that I regard the foreman as a mere figurehead, whom the law authorizes to employ a sufficient number of assistants to perform his work, I would draw attention to the reading of the bituminous mine law, art. 4, sec. 1, where it states in the second paragraph: "When the mine workings become so extensive that the foreman is unable, personally, to carry out the requirements of this act, pertaining to his duties, he shall have the right to employ a sufficient number of competent persons to act as his assistants," etc. As I understand the reading of this law, the entire work performed by the assistant makes up the duties referred to in the law as the mine foreman's duties.

Mr. Hogarth states that he does not think for a moment that any mine foreman would attempt to hide behind his assistant or throw the responsibility that was his own on the other man's shoulders. I want to refer him to the case of Willis vs. Commonwealth, in the 20th bituminous district of Pennsylvania. Mr. Hogarth seems to express his opinion of what the law should be, while I have tried to show what the law actually is as it reads.

I. C. Parfitt.

Jerome, Penn.

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Study Course in Coal Mining

By J. T. Beard

The Coal Age Pocket Book

Sources of Heat—In a sense the sun is the original source of most of the heat of the solar system—in other words, the sun is the power house of that system. It may be said that much of the terrestrial life and activity emanates from the sun. The source of the sun's heat is understood to be the chemical and possibly electrical activities being constantly developed in its huge mass and radiating heat, light and electrical energy.

The same chemical and possibly electrical activities are taking place to a less degree in the mass of the earth, creating internal heat. Both the radiated heat of the sun and the housekeeping ternl heat of the earth are **natural sources of heat.**

Besides these natural or physical sources of heat, there are the **mechanical sources of heat,** such as **friction, impact** and **pressure.** These each develop heat as the result of force applied mechanically.

Chemical Heat—Theory assumes that chemical heat is the result of the **chemical affinity** of material atoms for each other, by which they are drawn and held in more or less close contact and union. This condition is in harmony with the notion of "atomic heat," explained elsewhere, and suggests the estimation of the **heat of formation, or heat of combination,** as the result of chemical union.

In contrast with atomic heat, **molecular heat** is akin to specific heat and representative of the heat capacity of a substance, or the quantity of heat a particular substance will absorb, per unit weight, per degree of rise in its temperature. Theory assumes that all heat of any nature is a vibratory state of atoms or molecules and, as such, is convertible into or created by other forms of energy.

The **molecular heat** of a substance is found by multiplying a gram-molecule of the substance by its specific heat.

Combining Heat—All matter is assumed to possess a certain definite heat energy peculiar to itself, which is expressed in heat units, per unit weight of substance.

Heat of Formation—In the combining of atoms to form compound molecules, a neutralization of the energies of the combining atoms causes either an evolution or an absorption of heat, the molecule formed then possessing an amount of heat called "heat of formation" or "heat of combination."

Heat Due to Friction—Friction is caused by one body rubbing against another, whereby a molecular vibration is set up in the two bodies, as manifested by the heat generated.

Heat Due to Impact—The impact of one body against another likewise sets up a molecular vibration in the bodies, which is manifested by the heat generated.

Heat Due to Pressure—Pressure applied to a body having a degree of elasticity, or being compressible, forces the molecules of matter closer together, which reduces the intermolecular space and, as a result, there being no loss of molecular energy, the speed of vibration is increased in proportion as the space is diminished and heat is developed.

Transformation of Heat Energy—Heat energy of any nature, whether chemical or physical, is convertible, without loss, into mechanical energy measured in foot-pounds, which is the "mechanical equivalent of heat."

The Coal Age Pocket Book

THERMOCHEMISTRY

Thermochemistry treats of the heat changes that accompany all chemical reactions. A knowledge of such heat changes is of the greatest importance in the study of explosive phenomena.

Heat Changes—In a chemical reaction, combination always takes place, the heat energy of the compound or compounds formed being the **heat** or **heats of formation.**

Chemical reaction may also be accompanied by dissociation or decomposition of a compound, its heat of formation being then **heat of decomposition,** which neutralizes or is neutralized by the heats of formation of the products of the reaction. The heat of decomposition of a substance is always equal to its heat of formation.

The **heat of elements,** in a reaction, is always zero, there being no combination or dissociation in the element.

When the sum of the heats of formation of the products of a reaction is greater than the total heat of decomposition **heat is liberated** and the reaction is "exothermic." When the total heat of decomposition is the greater, heat is absorbed and the reaction is then "endothermic."

Heat of Combustion—This term is generally applied to the heat liberated in the oxidation of a combustible. The reaction is exothermic; and, in general,

$$\text{Heat of combustion} = \underset{\text{of products}}{\text{Heat of formation}} - \underset{\text{of combustible}}{\text{Heat of formation}}$$

The heat of combustion of a substance, like combining heat and heats of formation or decomposition, is expressed in heat units, per unit weight of substance. The following table gives the heats of combustion of some of the more important combustibles in mining:

TABLE OF HEATS OF COMBUSTION (Favre & Silbermann)

Combustible			Heat of Combustion, B.t.u. per Lb.
Methane, to carbon dioxide and water at 32 deg. F.			23,513
Olefiant gas, to carbon dioxide and water at 32 deg. F.			21,344
Carbon, to carbon dioxide			14,544
Carbon, to carbon monoxide			4,451
Carbon monoxide, to carbon dioxide			4,325
Hydrogen, to water at 32 deg. F.			62,032
Hydrogen, to steam at 212 deg. F.			51,717
Sulphur, to sulphur dioxide			4,000
Petroleum, heavy (sp.gr. 0.886)			19,000
Petroleum, light (sp.gr. 0.833)			18,200
Coal, average values,	(State)	(Fixed Carbon)	
Anthracite	Pennsylvania	84.3%	14,200
Bituminous	Pennsylvania	57.0%	14,900
Bituminous	West Virginia	65.8%	14,240
Bituminous	Illinois	46.4%	14,460
Bituminous	Ohio	51.5%	14,400
Bituminous	Kentucky	50.1%	12,700
Bituminous	Alabama	59.3%	13,700
Bituminous	Indiana	44.3%	14,140

The above are average values for each entire state, as taken from Government analyses and do not represent mining districts.

Inquiries of General Interest

Preserving Mine Timber

I desire to ask: (a) Is there any method in use for preserving mine timbers, particularly the crossbars used in mines, by dipping them in creosote, zinc sulphate or other preserving solutions, and what results have been accomplished by so doing? (b) Is it necessary to kiln-dry such timbers before dipping them? (c) What solution is considered best and cheapest for this purpose, and how long should such timbers be left in the solution? (d) Are there any data available showing the increase in the life of mine timbers when treated by any process intended to preserve the wood?

E. C. Leightty.

Danville, Ill.

These questions were submitted to the chemist of one of the largest manufacturers of wood preservatives and elicited the following reply:

(a) There are various methods in use of treating mine timbers with special preservatives—creosote, zinc sulphate, and the like. The results obtained have been satisfactory in proportion to the value of the material used and the thoroughness with which the treatment was effected. Owing to these varying conditions, it is impossible to state more explicitly the results accomplished.

(b) While it is not absolutely necessary that the timber should be kiln-dried before being treated, it is desirable that it should be as dry as possible, so that the wood will more readily absorb the preserving solution. This is particularly true in respect to creosote preservatives, which are the most efficient, because the creosote cannot penetrate the wood when the pores are full of moisture.

(c) In regard to what solution will prove the best and cheapest to use for preserving large timbers by dipping them, I may state that the coal-tar distillates have proved to be by far the most effective and economical. A wood preservative known as "conservo"—a brownish oily liquid distilled from coal tar—is the result of several years of experiments made to develop a liquid that will be sufficiently fluid to penetrate the wood and at the same time have sufficient substance to prevent its evaporation and loss, which would destroy the permanency of its preserving effect.

This preservative destroys bacteria and sterilizes the wood. It is practically nonvolatile and insoluble in water, which prevents its loss when timbers so treated are submerged or exposed to the action of moisture. It can be applied either hot or cold—with a brush, as paint is applied, or by dipping the timbers in tanks containing the liquid. The latter method is recommended for the treatment of mine timbers.

The length of time that the timbers should remain submerged in the tank depends on the character of the wood and whether the preservative is used hot or cold. It is always better to apply heat when that is feasible, because the heat increases the penetrating power of the preservative and drives out any latent moisture from the wood. A steam coil placed in the bottom of the tank will serve to heat the liquid and shorten the time of treatment, which can be varied from a few seconds to several minutes, depending on the degree of heat employed, the character of the wood and the thoroughness of application desired. The wood should be as dry as possible before placing in the tank. In special cases when great permanence is desired and the timbers are large, they are allowed to remain soaking in the tank for a longer period.

(d) The only available data respecting the increase in the life of timbers treated by different methods are to be found in the various publications of the Forest Service, United States Department of Agriculture. Circular No. 101, entitled "Treating Timber with the Open-Tank Process," is said to be out of print. There is much valuable information, however, contained in circulars Nos. 108 and 111, of the Forest Service Bureau—the former being entitled "The Strength of Wood as Influenced by Moisture," and the latter "Prolonging the Life of Mine Timbers." These publications were issued in the summer and fall of 1907. In addition to the brush and open-tank methods, the Government experimented on treating timbers in a closed cylinder under pressure, which greatly increased the penetration and effect of the preservative. The report shows that the life of timber treated with a creosote solution by these methods was prolonged as follows: Brush treatment, 6 per cent.; tank treatment, 41 per cent.; and cylinder treatment, 55 per cent.

⁂

Fireproofing Mine Canvas

Can you tell me how to fireproof canvas used for brattice cloth in the ventilation of a mine?

H. A. Everest,
Superintendent, Hazelton Coal Co.

Coalgate, Okla.

Numerous preparations have been used from time to time to render fabrics fireproof, and these attempts have met with variable success. For this purpose such salts as the silicates of zinc, lead and tin have been mostly employed. Certain firms interested in the question of fireproofing material have made a careful study of the subject, with the result that more or less effective fireproofing solutions have been prepared and are now offered on the market. The price of these solutions is practically prohibitive for mine use.

The Antipyros Co., 170 Greene St., New York City, offers for sale heavy duck canvas, in rolls of 50, 100 and 150 yd., 2 yd. wide, which is claimed to be fireproof and suitable for mine use as brattice cloth.

Readers of *Coal Age* will be glad to learn of the experience of any who have attempted the fireproofing of cloth and other combustible material used in mines. A preparation known as "oxylene" has recently been employed with much success in fireproofing timber in England, but has not as yet, we believe, been used in this country.

Examination Questions

Miscellaneous Questions

(Answered by Request)

Ques.—If a collar 6 ft. long and 8 in. in diameter supports a certain weight, what must be the diameter of a collar 12 ft. long to support the same weight?

Ans.—The question omits to state whether the entire load resting on the full length of the collar or the unit load per foot of length is intended. The solution is different in each case. For the same total load, the diameter of the collar varies directly as the cube root of the length of the collar; or, in other words, the diameter ratio is equal to the cube root of the length ratio, which gives in this case, calling the required diameter *x*,

$$\frac{x}{8} = \sqrt[3]{\frac{12}{6}} = \sqrt[3]{2} = 1.26$$

$$x = 8 \times 1.26 = \mathit{say}\ 10\ \mathit{in.}$$

The more usual condition in mining practice is, however, the unit load, or load per foot of length, corresponding to the roof pressure that the timbers must support. In this case the diameter of the collar varies directly as the cube root of the square of the length, which gives

$$x = 8 \times \sqrt[3]{2^2} = 8 \times \sqrt[3]{4}$$

$$x = 8 \times 1.58 = 12.6\ \mathit{in.}$$

Ques.—If the temperature of 10 cu.ft. of air is raised from 60 to 580 deg. F., what amount of work will be done?

Ans.—In the free expansion of air the external work performed is that required to overcome the atmospheric pressure (14.7 lb. per sq.in. or 2116.8 lb. per sq.ft., sea level). Assuming a column of air having a base of 1 sq.ft. and 10 ft. in height, and supposing the expansion to take place in the direction of the height of the column, since the volume of air varies directly as its absolute temperature, the height of the air column after expansion will be

$$\frac{460 + 580}{460 + 60} \times 10 = \frac{1040}{520} \times 10 = 20\ \mathit{ft.}$$

The increase in the height of the column is then 20 — 10 = 10 ft. and the work performed, in this case, is 2116.8 × 10 = 21,168 ft.-lb.

A similar result can be obtained by estimating the work on a heat-unit basis. Evidently the external work performed in the free expansion of air corresponds to the difference between the absorption of heat by air under constant pressure and that under constant volume. For a single pound of air, and one degree (F.) rise in temperature, this difference is the difference between the specific heat of air for constant pressure (0.2374) and that for constant volume (0.1689), which gives 0.2374 — 0.1689 = 0.0685 B.t.u.

The weight of 10 cu.ft. of air at atmospheric pressure (sea level) and a temperature of 60 deg. F. is 10 × 0.0766 = 0.766 lb. The total rise in temperature, in this case, is 580 — 60 = 520 deg. F. Then since 1 B.t.u. equals 778 ft.-lb. of work, the external work performed in the expansion of 10 cu.ft. of air, owing to a rise of temperature from 60 deg. to 580 deg. F., is

$$0.0685 \times 0.776 \times 520 \times 778 = 21{,}227\ \mathit{ft.\text{-}lb.}$$

Ques.—How many pounds of carbon will be required to burn 100 lb. of oxygen in the production of carbon monoxide?

Ans.—In the production of carbon monoxide by the burning of carbon in oxygen one atom of oxygen unites with one atom of carbon to form a molecule of carbon monoxide (CO). The relative weights of carbon and oxygen in this reaction are expressed by their atomic weights—carbon, 12; oxygen, 16. Hence, calling the weight of carbon required to consume 100 lb. of oxygen *x*, we have

$$16:12::100:x = 75\ \mathit{lb.}$$

Ques.—A fan running at 70 r.p.m. produces 120,000 cu.ft. of air per min. under a 2.5 in. water gage. At what speed must the fan run to produce 150,000 cu.ft. of air per min. in this mine, and what would the water gage be for this increased speed and circulation?

Ans.—In fan ventilation the volume is commonly assumed as being proportional to the speed of the fan. In other words, the volume ratio is assumed to be equal to the speed ratio of the fan. On this basis, calling the required speed of the fan *x*, we have

$$\frac{x}{70} = \frac{150{,}000}{120{,}000} = \frac{5}{4} = 1.25$$

$$x = 1.25 \times 70 = 87.5\ \text{r.p.m.}$$

In practice this result is not realized, but the fourth power of the speed ratio is equal to the fifth power of the quantity ratio, which gives, in this case,

$$\frac{x}{70} = \sqrt{\left(\frac{5}{4}\right)^5} = \sqrt[4]{1.25^5} = 1.32$$

$$x = 70 \times 1.32 = 92.4\ \mathit{r.p.m.}$$

For the same conditions in the mine, the water gage varies with the square of the quantity of air in circulation. Hence, calling the required water gage *x*, we have, in this case

$$\frac{x}{2.5} = \left(\frac{5}{4}\right)^2 = 1.25^2 = 1.56$$

$$x = 2.5 \times 1.56 = 3.9\ \mathit{in.}$$

Ques.—Under what conditions may afterdamp become explosive?

Ans.—When the afterdamp of an explosion contains considerable unburned methane or a large proportion of carbon monoxide the mixture may become again explosive by the addition of fresh air proceeding from other portions of the workings of the mine or supplied by the readjustment of the air current.

Ques.—What changes take place in the atmosphere of a mine during an explosion of firedamp?

Ans.—The oxygen of the mine air combines with the carbon and the hydrogen of the firedamp to form carbon dioxide and water vapor and some carbon monoxide is produced if the supply of air is limited.

Coal and Coke News

PENNSYLVANIA

Anthracite

Scranton—While the mining of anthracite by machine has not been generally adopted it is probably being used to a greater extent in the cutting of coal in this district than anywhere else in the anthracite region. The miners admit that the cutting of coal by machine is practically in its infancy, yet they realize that it is rapidly coming to be an important factor in the industry and are asking that an agreement be made with the operators whereby this grade of work will be paid for at an equitable rate.

Pottsville—The local strike which has existed at the Locust Gap colliery of the Philadelphia & Reading Coal & Iron Co. since last May has been practically ended by the men agreeing to return to work pending an appeal of their grievance to the Conciliation Board. The suspension was caused by a dispute as to the method of payment, and 1200 men have been idle for the past two months.

Packer No. 5 colliery of the Lehigh Valley Coal Co., at Lost Creek, has been shut down by a strike. Orders were issued that all inside men should remain on duty a half hour longer than usual. This order was disobeyed by several men and they were discharged. On learning of their dismissal the entire force of 1200 men refused to continue at work.

A new colliery to supply domestic trade is to be started by the Rosenberger Brothers on Sharp Mountain. A coal bed has been discovered which is much harder than any heretofore found in that region. Plans are underway for the construction of a breaker considerably larger than any here-to fore built in that locality.

Wilkes-Barre—Damages amounting to $25,000 are asked for in a suit filed by Frances Michock, of West Nanticoke against the West Nanticoke Coal Co. The husband of the Plaintiff was electrocuted about four months ago and the company is charged with negligence.

Tamaqua—During most of the summer, the Morea and New Boston collieries of the Dodson Coal Co. have been working three or four days a week. They have recently, however, started working full time.

Shenandoah—Five men were hurt in various mining accidents in the collieries of this vicinity in a single day the past week. Among this number, Peter Nitsavage received probable fatal injuries.

Shamokin—Nine hundred miners at the Hickory Ridge colliery of the Susquehanna Coal Co., recently went on strike to compel some of the employees to pay dues into the union. This tied up the entire plant.

Bituminous

Scottdale—The H. C. Frick Coke Co. recently ordered into operations 260 additional ovens. The plants affected by this order are Colonial No. 1, Continental No. 3, Edenborn, Hecla No. 3, Leisenring Nos. 1, 2 and 3, United, York Run, Hostetter and Whitney.

Connellsville—Nine hundred ovens were recently added to the producing capacity of the Connellsville coke region, bringing the possibilities of production up to 400,000 tons per week. This production has not been reached, but 371,000 tons weekly has been produced. The furnace ovens are operating at 76½ per cent. capacity, while the merchant interests are operating at 62.6 per cent. There appears to be no particular shortage of labor.

Monessen—A first aid contest to decide who shall hold the silver loving cup for a year will feature the annual picnic and outing of the miners of District No. 5, to be held on Saturday, Aug. 14, at Eldora Park. Over $300 in prizes will be awarded. Twelve teams are now entered in the first aid events, and probably more will enter. In addition to the cup, the members of the winning team will be given gold and silver medals.

Washington—Charged with violating the bituminous mining laws of the state by carrying black powder in excess of 5 lb. into the Penobscot mine of the Avella Coal Co., two Italian miners were recently placed under arrest on information placed by Mine Inspector C. J. Callaghan of the 26th District. The men were arraigned before Justice of the Peace J. F. Carmichael and held for court.

Herminie—Work has already been started on the grading and opening of the drift mine into the Waynesburg coal bed on the Mitchell farm near Herminie. E. G. Smith, of Irwin, has charge of the construction work.

WEST VIRGINIA

Bluefield—The Raleigh Coal & Coke Co. during June loaded 60,000 tons of coal, which is the largest one month's business ever enjoyed by that firm. Preparations are being made to increase the tonnage to 100,000 tons per month.

Mullens—The Mullens Smokeless Coal Co. recently shipped its first output. This operation is across the Guandotte River from the railroad the coal from the mine being transported across the river to the railway in buckets on an aërial tramway.

Parkersburg—The semi-monthly pay of the Consolidation Coal Co. for the first half of July was the largest since 1914, the miners in the Clarksburg Districts receiving $90,000. The past month was the best in the company's history but prospects for the current month are even better. Twenty-eight thousand seven hundred and fifty-six tons were recently mined in one day.

Moundsville—The Mound City Coal Co. has a force of men at work on a building which is to be used as a mine supply room. Here mine supplies of all descriptions will be kept ready for use at any time.

Gary—The No. 4 stable of the United States Coal & Coke Co. was recently destroyed by fire originating from an unknown cause. It is reported that 14 head of mules were lost in this fire as well as a considerable amount of hay and grain. The monetary loss is estimated at $4000.

Charleston—During the 21 months that the Workmans Compensation Law has been in effect in West Virginia, $136,000 has been paid in pension claims. The Eccles explosion has thus far cost $29,880, the Layland explosion $4000 and the Carlisle $590.

Prosecutions have recently been conducted in two of the mining districts of the state for violations of the law relating to the safety of operations. In one instance occurring at Yukon, McDowell County, a mine foreman was convicted of allowing miners to enter the shaft before the fans had cleared the atmosphere. In another case, 17 miners were found guilty of shooting coal from the solid. Each of the 17 were fined $10 and costs and warned not to offend again. The mine foreman who allowed the miners to enter before the mine had been cleared of gas was fined $50 and costs.

KENTUCKY

Lexington—The strike at the mines of the New Jellico Mining Co. in Bell County has been settled. The company granted a 10 per cent. increase to the men. There are still 600 miners out at other mines in Bell County.

Fleming—The Elk Horn Mining Corporation has received some large orders from the Great Lake region for early delivery and makes the announcement of increases in the output. The mines around Fleming, Haymond, McRoberts, Jenkins and Burdine are the most active since developments were first started. Already the railroads are taxed to handle the large tonnage. With increased output more trains will have to be added.

OHIO

Columbus — Ten thousand Hocking Valley miners, two-thirds of whom are idle and the other third earning only a fraction of normal income, have filed, through their officials, a petition with Governor Willis, asking that some means be devised for relieving the destitution of that region. One plan that had previously been proposed by the Governor was to begin construction on public highways throughout the Hocking Valley. The highway department announces that it is out of funds with which to prosecute this enterprise.

Wellston—The first shaft into the new coal region east of Wellston will be started as soon as the elevation of the coal measure can be ascertained by the drillers. The company has taken options on adjoining land which will be thoroughly drilled and proven, in order to determine the levels of No. 2, No. 4 and No. 5 coal beds. The first shaft will have an equipment capable of securing 2000 tons per day from the No. 2 measure. Six hundred men will be employed in the new Wellston mine.

INDIANA

Bicknell—Robinson Bros. of Lincoln who are sinking a shaft opening for a coal mine near Edwardsport, have reached the River vein. Later they will work a deep coal bed north of this mine.

ILLINOIS

Edwardsville—The suit in assumpsit for $15,000 by the Illinois Coal Operators Mutual Employees Liability Insurance Co., against the Lumaghi Coal Co., of Collinsville, has been dismissed at the request of the plaintiff. It is believed that a settlement was made out of court. The bill alleged that the defendant failed to live up to the terms of an insurance policy.

Judge J. F. Gillham, of the Madison County Circuit Court has issued an order directing the Illinois Coal Co., to produce its books in court to show how a dividend of $12,000 was dividend among stockholders on March 2, 1909, two days before suit for an accounting was filed by the Mount Olive and Staunton Coal Co. The Illinois Coal Co. was formerly a flourishing organization. Attorneys for the Mt. Olive and Staunton company have asked permission to file a bill of execution against the stockholders of the Illinois Coal Co. for $4,118.77, the amount of the judgment obtained in the suit for an accounting. The plaintiff company alleges that when the judgment was given there were no funds in the defendent company to satisfy the judgment.

Carlinville—The Superior Coal Co. has obtained an injunction against the Miller Oil Co. at Staunton and the Ohio Oil Co. in the same field to restrain them from drilling through the coal company's coal rights to reach the oil sands. The court proceeding has put a check upon the Macoupin County oil boom. It is expected that the case will be fought through to the highest courts and the mineral rights of the coal companies determined.

New Baden—The mine of the New Baden Mining Co. has been closed on account of damage to the shaft. It is expected to remain idle 10 or 15 days.

KANSAS

Topeka—John Pellegrino, state mine inspector, reports that the Western Coal & Mining Co., will open its mine in Franklin and expects to employ all the idle men there. The Sheridan Coal Co., is going to open mine No. 8 at Breezy Hill; the Western Coal & Mining Co., already has opened mine No. 14 at Fleming; and the Cherokee & Pittsburgh Coal & Mining Co., has leased mine No. 14 at Capaldo, and expects to start operations shortly.

Pittsburg—One miner was killed and another badly injured in a recent gas explosion at Mine No. 7 of the Sheridan Coal Co. near Mulberry. The plant had been idle several days because of water in the workings.

COLORADO

Denver—The long-pending suit of the Government against the Union Pacific Coal Co. will be heard shortly. The Government seeks to cancel the patents held by the company to 2400 acres of coal land in the vicinity of Durango that had been originally entered under the Timber and Stone Act.

FOREIGN NEWS

Berlin, Germany—It is reported that a mining engineer who went to Turkey, just before that country entered the war, for the purpose of hunting for coal deposits which might make the country independent of foreign sources has found three excellent coal measures. The Turks proceeded to develop these at once, and the German government now believes that the coal problem of its ally will not prove of embarrassment while hostilities last.

Wainwright Inlet, Alaska—It appears that the government can stop the whites from mining coal in Alaska, but not the natives. They have already mined several hundred tons from the bituminous seams near here, and have made arrangements to ship it to their villages. The Eskimos viewpoint since they have learned that black rock will burn, is that the rock was there before the government came along, and the Almighty must have put it there for them to use. Anyway, it burns much better than waterlogged driftwood.

Fernie, B. C.—A further inquiry into the explosion in the "B" North Mine, Coal Creek, which occurred on Jan. 2 of this year has been ordered by W. J. Browser, acting minister of mines in view of the commissioner's report on evidence taken at the investigation in March. This evidence, the minister declares, warrants a further investigation. The new inquiry opened with Judge Forin, of Nelson presiding as commissioner. The preliminary investigation found that the explosion was attributable to an accumulation of gas due to stoppage of the ventilating fan. The mine superintendent and mine foreman are charged with having been dilatory in their duties.

Juneau, Alaska—Discovery of an extensive coal field on Admiralty Island said to be the first of its kind found in Southeastern Alaska, has been reported. The coal was discovered about June 20 by Charles Sandman who at the time was engaged in cruising timber on the island. Having staked a claim Sandman hastened to Juneau where he interested some friends who are now financing the proposition. A patent has been applied for. According to the information obtained from Sandman the coal field is situated on the island 3 miles north of Killisnoo and 30 miles south of Juneau by water. The coal is said to crop out along the shore in such a position that it can be loaded into a steamship direct. Juneau operators are well pleased with the discovery.

PERSONALS

David Fleming, first resident superintendent of the Berwind-White mines, at Windber, Penn., after an absence of 15 years has returned to become the head of the Beacon shaft mine at Dunlo.

William J. von Bonies, mining engineer, of Louisville, Ky., formerly of Davies & von Bonies, engineers, of Louisville and Lexington, Ky., has given up that practice and accepted a position at Joplin, Mo.

James Matthews, president of the miners' organization in the vicinity of Shenandoah, Penn., has been presented with one of the pens used by Governor Brumbaugh in signing Senate bills Nos. 160 and 931, the approval of which acts brought the miners under the provisions of the Workmen's Compensation Law.

White L. Moss, of Pineville, Ky., has resigned his position as vice-president and general manager of the Continental Coal Corporation, whose operations are at Pineville and vicinity. The duties of the office were assumed by Maxwell S. Barker, of Louisville, Ky., chairman of the executive committee, pending the annual meeting held at Chattanooga, Tenn.

George Watkin Evans has been appointed to determine what areas of coal land shall be reserved by the government and what shall be thrown open to lease in Alaska. Mr. Evans is thoroughly familiar with both the Matanuska and Bering fields. While his name is mostly connected with the Matanuska field, owing to the fact that he was in charge of the government work in selecting and extracting the coal from this field to be tested to determine its availability for naval use he is even better acquainted with the Bering River coal field having been over the entire area many times.

OBITUARY

D. B. McClelland, vice-president, treasurer, and a director of Spang, Chalfant & Co., the Fayette Coal Co., and the Spang Land Co., died at his home in Pittsburgh on July 21.

James Elliott, of McAlester, Okla,, vice-president and general manager of the Haily-Ola Coal Co., of Hailyville, Okla., and receiver of the Great Western Coal & Coke Co., of Wilburton, Okla., and the Osage Coal & Mining Co., of Krebs, Okla., died recently.

J. W. Ganoe, a well-known merchant and coal operator died suddenly at his residence at Phillipston after returning from a convention of coal men at Buffalo, N. Y. Mr. Ganoe was 64 years of age, and a veteran of the Civil War. He is survived by his widow, four daughters, one son, two sisters and two brothers.

William H. Depew died at his home in Jermyn, Penn., recently, at the age of 66 years. Mr. Depew started work at the age of 16 years for John Jermyn, who owned the breaker known as Jermyn No. 1. This later became the property of the Delaware & Hudson Co., with which firm Mr. Depew remained after the transfer, becoming the head of the blacksmithing department for this company, which position he has held for the past several years.

Joseph R. Bailey, of Fairmont, W. Va., a former resident of Connellsville, was killed while crossing the railroad tracks at Rowlesburg, W. Va. Mr. Bailey came to Connellsville in 1900.

In 1907 he and W. G. McGinnis formed the Pittsburgh Steam Coal Co. and developed the Elizabeth mine. Later they purchased the Opekiska mine, of the Marietta-Stillwagon interests, holding it until about two years ago, when it was sold to the Connellsville Coal & Coke Co. Since then Mr. Bailey has been engaged in the coal and timber business in West Virginia.

TRADE CATALOGS

Joseph T. Ryerson & Son, Chicago, Ill. "Glyco." Illustrated, 70 pp., 4½x7¼ in.

The Milwaukee Fuel Co., Milwaukee, Wis., "Screenings." Illustrated, 15 pp., 6x9 in.

The American Steel & Wire Co., "American Wire Rope." Illustrated, 247 pp., 6x9 in.

Joseph T. Ryerson & Son. Chicago, Ill. "Forged Drills." Illustrated, 51 pp., 4½x7¼ in.

Dodge Sales and Engineering Co., Mishawaka, Ind. Catalog. "Gearing." Illustrated, 126 pp., 6x9 in.

The Gardner Governor Co., Quincy, Ill. "Gardner Air Lift Pumping." Illustrated, 16 pp., 6x9 in.

Knox Motor Associates, Springfield, Mass. "The Knox Tractor." Illustrated, 16 pp., 12x9½ in.

Joseph T. Ryerson & Son, Chicago, Ill. "Concrete Reinforcing." Illustrated 16 pp., 4½x7¼ in.

The Colonial Supply Co., Pittsburgh, Penn. "Safety First Manual." Illustrated, 88 pp., 7¾x10¾ in.

Scranton Pump Co., Scranton, Penn. Bulletin 102. "Duplex Plunger Pumps." Illustrated, 12 pp., 6x9 in.

The Kerr Turbine Co., Wellsville, N. Y. "Economy Geared Turbines." Sixteen pages, 6x9 in., illustrated.

The American Blower Co., Detroit, Mich. "Sirocco Products." Thirty-two pages, 8½x11 in., illustrated.

The Roberts & Schaefer Co., Chicago, Ill. "Marcus Patent Picking Table Screen." Illustrated, 8 pp., 9x11½ in.

Cresson-Morris Co., Philadelphia, Penn. Form No. 1001. "Barometric Condensers." Illustrated, 28 pp., 9x12 in.

The A. S. Cameron Steam Pump Works, 11 Broadway, New York. Bulletin No. 152. Eight pages, 6x9 in., illustrated.

International Mill & Timber Co., Bay City, Mich. Catalog. "Sterling System-Built Houses." Illustrated, 72 pp., 9x12 in.

The Walter A. Zelnicker Supply Co., St. Louis, Mo. "Net Price List of Hickory Handles." Unillustrated, 4 pp., 3¾x6½ in.

Joseph T. Ryerson & Son. Chicago, Ill. "The Largest Iron and Steel Warehouse in the World." Illustrated, 46 pp., 11x 8½ in.

Gifford-Wood Co., Hudson, N. Y. Bulletin No. 16. "Portable Wagon Loaders for Handling Coal, etc." Illustrated, 12 pp., 6x9 in.

Link-Belt Co., Philadelphia, Penn. Bulletin No. 221. "Circular Storage System for Storing Coal, etc." Illustrated, 4 pp., 6x9 in.

The Marion Steam Shovel Co., Marion, Ohio. Catalog No. 93. "Marion Reliability and Your Profits." Illustrated, 48 pp., 5½x8 in.

The A. S. Cameron Steam Pump Works, 11 Broadway, New York. Bulletin No. 300. "Cameron Triplex Pumps." Four pages, 6x9 in.

National Tube Co., Pittsburgh, Penn., National Bulletin, No. 20, "Index for National Bulletins Nos. 1 to 20." Illustrated, 32 pp., 8½x11 in.

Joseph T. Ryerson & Son, Chicago, Ill. "Internal Furnace Boilers with Morrison Corrugated Furnaces." Illustrated, 84 pp., 4½x7¼ in.

The A. S. Cameron Steam Pump Works, 11 Broadway, New York. Bulletin No. 104, "Cameron Pumps." Thirty-six pages, 6x9 in., illustrated.

Link-Belt Co., Philadelphia, Penn. Book No. 210. "Wagon and Truck Loaders for Coal, Coke, Stone, Sand, etc." Illustrated, 48 pp., 6x9 in.

The General Electric Co., Schenectady, N. Y. "Standard Unit Direct Current Power Plant Switchboard Panels." Illustrated, 21 pp., 8x10½ in.

Joseph T. Ryerson & Son. Chicago, Ill. "Ryerson's Ready Reference." A loose leaf book containing much valuable data on steel and steel products.

The A. S. Cameron Steam Pump Works, 11 Broadway, New York. Bulletin No. 104, "Cameron Centrifugal Pumps." Sixteen pages, 6x9 in., illustrated.

The A. S. Cameron Steam Pump Works, 11 Broadway, New York. Bulletin No. 151. "Cameron Turbine Centrifugal Pumps." Twenty pages, 6x9 in., illustrated.

The Harrison Safety Boiler Works, Philadelphia, Penn. Cochrane Engineering Leaflet No. 18, "Testing V-notch Meters." Forty-eight pages, 6x9 in., illustrated.

S K F Ball Bearing Co., 50 Church St., New York. Bulletin No. 25. "S K F Ball Bearings in Machine Tools and Shop Equipments." Illustrated, 68 pp., 6x9 in.

The A. S. Cameron Steam Pump Works, 11 Broadway, New York. Bulletin No. 153. "Cameron Centrifugal Pump for House Service." Eight pages, 6x9 in., illustrated.

Chicago Pneumatic Tool Co., Fisher Building, Chicago, Ill. Bulletin No. 34-U. "Instructions for Installing and Operating Class N-SO Fuel Oil Driven Compressors." Illustrated, 24 pp., 6x9 in.

Sullivan Machinery Co., 122 S. Michigan Ave., Chicago, Ill. Bulletin No. 66G. "Air-feed Stoping Drills". Illustrated, 12 pp., 6x9 in. Blue Booklet No. 115. Air Compressors." Illustrated, 32 pp., 3x5½ in.

The Jeffrey Mfg. Co., Columbus, Ohio. Bulletin No. 165: "Wagon and Truck Loaders for Crushed Stone, Sand, etc." Illustrated, 16 pp., 6x9 in. Bulletin No. 166. "Wagon and Truck Loaders for Bituminous and Anthracite Coals." Illustrated, 24 pp., 6x9 in.

RECENT COAL AND COKE PATENTS

Coke Oven. A. Roberts, Evanston, Ill. 1,132,685 Mar. 23, 1915. Filed Sept. 8, 1914. Serial No. 860,583.

Coal Device. D. Hilleman, St. Louis, Mo. 1,133,141 Mar. 23, 1915. Filed Apr. 7, 1914. Serial No. 830,275.

Mine Tipple Car. J. Cozilets, Coupon, Penn., 1,141,442, June 1, 1915, Filed July 14, 1913. Serial No. 778,967.

Miner's Safety Lamp. E. F. Koehler, Hudson, Mass. 1,132,522 Mar. 16, 1915. Filed Oct. 28, 1912. Serial No. 728,154.

Mechanical Stoker. J. E. Murphy, Winnipeg, Canada, 1,140,761, May 25, 1915. Filed Mar. 10, 1914. Serial No. 823,731.

Steam Boiler Furnace. C. E. Googins, Brooklyn, N. Y., 1,140,674, May 25, 1915. Filed June 15, 1914. Serial No. 845,134.

Coal Loading Machine. F. S. Converse, Binghamton, N. Y. 1,133,008 Mar. 23, 1915. Filed Aug. 10, 1914. Serial No. 856,023.

Mine Car Wheel and Axle. F. A. Sweet, Salt Lake City, Utah, 1,141,990, June 8, 1915. Filed Nov. 28, 1914. Serial No. 874,383.

Coal Washer. A. J. Sayers assignor to Link Belt Co., Chicago, Ill., 1,142,060, June 8, 1915. Filed Aug. 29, 1913. Serial No. 787,254.

Smoke Consumer. G. O'Neil, Moncton, New Brunswick, Canada. 1,131,944 Mar. 16, 1915. Filed Oct. 19, 1914. Serial No. 867,441.

Apparatus for Ejecting Ashes. W. S. Parsons, Ladywell, England. 1,131,951 Mar. 16, 1915. Filed Aug. 4, 1911. Serial No. 642,373.

Screening Conveyor. T. F. Webster assignor to Link Belt Co., Chicago, Ill., 1,142,060, June 8, 1915. Filed Jan. 27, 1912. Serial No. 673,708.

Miners Acetylene Gas Lamp. J. A. Gustafson, Idaho Springs, Colo., 1,142,699, June 8, 1915. Filed Aug. 29, 1914. Serial No. 859,259.

Coal Washing Apparatus. E. G. Burks, and N. Hayes, Birmingham, Ala. 1,132,422 Mar. 16, 1915. Filed July 3, 1914. Serial No. 848,985.

Mechanically Operated Grate for Furnaces. W. R. Wood, London, Eng., 1,141,226 June 1, 1915. Filed Nov. 28, 191 Serial No. 874,537.

Draft Regulator and Smoke Purifier. J. A. and M. L. McFerran, Louisville, Ky., 1,142,721, June 8, 1915. Filed Oct. 3 1914. Serial No. 869,463.

Mining Machine. F. L. Sessions, assignor to Jeffrey Mfg. Co., Columbus, Ohio. 1,132,800 Mar. 23, 1915. Filed Sept. 3, 1910. Serial No. 580,410.

Construction of Water Tube Boilers. R. Delaunay, Belleville, St. Denis, France. 1,132,458 Mar. 16, 1915. Filed July 20, 1914. Serial No. 852,077.

Water Tube Boiler. J. E. Bell, assignor to Babcock & Wilcox Co., New York, N. Y., 1,141,520, June 1, 1915. Filed Dec. 26, 1905. Serial No. 293,170.

Automatic Stoker. D. T. Williams assignor to Standard Stoker Co., Wilmington, Del., 1,142,293. June 8, 1915. Filed Oct. 29, 1913. Serial No. 798,009.

Mining Machine Car Truck. C. E. Davis assignor to Goodman Manufacturing Co., Chicago, Ill., 1,141,943, June 8, 1915. Filed Sept. 14, 1912. Serial No. 720,366.

Operating Device for Coke Oven Doors. C. V. McIntire, assignor to H. K. Koppers Co., Chicago, Ill., 1,141,132, June 1, 1915. Filed Dec. 8, 1913. Serial No. 805,216.

Mining Machine and Truck. E. R. Merrill, assignor to Jeffry Manufacturing Co., Columbus, Ohio, 1,142,348. June 8, 1915. Filed Sept. 12, 1910. Serial No. 581,489.

Coal Gas Generating Apparatus. H. A. Carpenter, assignor to Riter-Conley Mfg. Co., Pittsburgh, Penn., 1,140,798, May 25, 1915. Filed Jan. 2, 1915. Serial No. 118.

Gas Producer. E. A. W. Jeffries and G. H. Isley, assignors to Morgan Construction Co., Worcester, Mass., 1,142,100, June 8, 1915. Filed Mar. 2, 1908. Serial No. 418,656.

Baffle System for Stirling Boilers. D. S. Jacobus assignor to Babcock & Wilcox Co., Bayonne, N. J. 1,132,014 Mar. 16, 1915. Filed Aug. 12, 1913. Serial No. 784,313.

Furnace Stoker for Feeding Coal Dust or Other Comminuted Fuels. C. L. Heisler, Schenectady, N. Y., 1,140,817, May 25, 1915. Filed Jan. 20, 1913. Serial No. 743,202.

INDUSTRIAL NEWS

Garrison, W. Va.—The Roberts & Schaefer Co., of Chicago, Ill., recently closed a contract with the Webb Coal Mining Co. for the equipment of a Marcus patent coal tipple for immediate installation at Garrison.

Birmingham, Ala.—The United States Supreme Court in an action against the Louisville & Nashville, Nashville, Chattanooga & St. Louis, Tennessee Central and Illinois Central railroads has reduced rates on coal from Kentucky mines to Nashville from $1 to 80 cents.

Grafton, W. Va.—J. M. Shackelford, of Glenville, it is reported has sold all of his coal holdings in Gilmer and Braxton counties, consisting of about 2000 acres to Lloyd Beeghley and Andrew Admiston, both of Weston. The price paid is said to approximate $200,000. The coal is all of the Pittsburgh vein 8½ ft. thick.

Harrisburg, Penn.—The first monthly reports of coal production by the anthracite companies have reached the office of the Auditor General under the provisions of the tax act of 1915. At a recent conference of coal operators and state officials it was arranged that these reports should be as of the 20th of each month.

Harrisburg, Ill.—The Roberts & Schaefer Co., of Chicago, has been awarded a contract by Charles I. Pierce, president of the Saline County Coal Co. for the equipment of a Marcus patent coal tipple for installation in the Harrisburg, Ill. field. Also an order for the building of two modern bath houses at the mines at Harrisburg.

Portsmouth, N. H.—The entire Navy Yard fire department was recently called out to fight a stubborn fire in the forward bunkers of the United States auxiliary collier "Vulcan." The vessel carried approximately 12,000 tons of coal, 1000 tons of which it is believed have been destroyed. No material damage was done to the collier.

Billings, Mont.—Coal-bearing lands purchased in 1910 as grazing land for $2 per acre have been finally awarded to the purchasers, Yegen Brothers & Simonsen and their associates. The land is appraised by the government at $30 per acre, and is said to run rich in coal, but through some error, in the office at Washington, it was sold for $2 and the government has decided to issue the final certifications, thereby completing the sale.

Scranton, Penn.—The first real effect of the war on the labor situation has been noticeable recently, when 3000 Italian reservists employed in and about the collieries in this vicinity left the city on their way to Italy. The outlook is that quite an additional number will soon be on their way. Because of the dull times at the collieries the men are apparently taking advantage of the opportunity to get back home for a visit.

Rush Run, Ohio—Officials of the Beech Flats Coal Co. have been looking over their property in this section and it is believed anticipate making an important land deal. It is understood that this firm, together with the Blythe Coal Co. wishes to purchase three or four farms which adjoin the mining property of the two firms. As yet no deal has been consummated so far as is known. It is thought that part of this land will be stripped in order to secure the coal.

Whitesburg, Ky.—R. D. Baker, of Big Stone Gap, Va., and others are involved in an interesting coal and timber land litigation. Several years ago representatives of the Swift Coal & Timber Co. went into the Line Fork Creek section and purchased some 10,000 acres of coal and timber property. It developed that about 12 months before, R. D. Baker and others representing a Philadelphia corporation had taken options on the same property, the option still being good. A few weeks ago, the Swift Coal & Timber Co. began preparations to develop part of the holdings. Suit was then entered by Mr. Baker and others against this firm, claiming that they were the legal and proper owners. This is one of the largest coal and timber land litigations perhaps ever entered in eastern Kentucky.

Louisville, Ky.—Under a trust agreement filed with the Louisville Trust Co., holders of about $2,100,000 of bonds of the Continental Coal Corporation, are expected to acquiesce in payment of interest at the rate of 3 per cent. per year, instead of 6 per cent., for the next two years. According to M. S. Barker, chairman of the Executive Committee of the corporation, bondholders having about $900,000 of the bonds have sent in their consent already, while consent of 80 per cent. of the bondholders is required before the contract becomes effective. This much progress was made in 15 days and completion of the plan is thought to be likely. A semi-annual payment was due July 1, and this disbursement would be affected by the agreement. General depression of business is represented by the officers of the company as the reason for the temporary reduction. The bonds in question were issued in 1911.

Louisville, Ky.—First reviews of the forthcoming official report of C. J. Norwood, chief of the State Department of Mines, shows that 20,168,150 tons of commercial coal were mined in Kentucky in 1914, exceeding the output of the state during any previous year. The net increase is 743,968 tons over 1913, is explained by a big increase in production in Eastern Kentucky and in spite of a decrease in the production in western Kentucky, which showed a falling off of 664,242 tons. During the year there were 53 casualties in the mines of the state. The report also will show that the state had 270 companies operating a total of 364 mines at the end of 1914, located in 39 counties and employing from 32,000 to 33,000 miners. Prof. Norwood will urge the need of additional inspectors and states that he will call all present inspectors to a conference at Lexington, to consider means of making the best of the circumstances until the Legislature makes provision for more inspectors.

New York, N. Y.—Default having occurred in the payment of interest coupons due July 1, 1915 to the holders of Kanawha & Hocking Coal & Coke Co. 50-year first mortgage five per cent. sinking fund gold bonds issued under mortgage to Morton Trust Co., trustee, dated July 1, 1901, a committee has been formed to protect the interests of the bondholders. This committee is of an opinion that an effective demand should be made forthwith upon the companies which guaranteed the principal and interest of the bonds to make good the default of the interest payment and in order to do this bondholders are requested to deposit their holdings with the Bankers Trust Co., No. 16 Wall street. The committee consists of Daniel E. Pomeroy, chairman, vice-president, Bankers Trust Co.; Walker Buckner, vice-president, New York Life Insurance Co.; Lewis L. Clarke, president, American Exchange National Bank, and Stacy C. Richmond, of Winslow, Lanier & Co.

Columbus, Ohio—A gathering of railroad officials and Ohio coal operators, to the number of about 70, considered the question of coal rates from Ohio fields, at Columbus, on July 19 and 20. The conference was of an informal, friendly nature, to discuss the matter of raising the differential between Ohio and West Virginia. The operators held to their contention that under existing conditions there must be relief in the matter of rates or the bulk of the mines would have to remain idle. It was the belief of some of the railroad men that Ohio producers in some districts had allowed their markets to get away from them through suspension of operation, and that present troubles were due as much to labor as to rate conditions. A committee of 14, composed of railroad men and operators was appointed to present a scheme of action. Another conference will be held at Cleveland shortly when the committee is expected to make a partial report. Every mining district was represented on the committee, as were the following railroads: Hocking Valley, Baltimore & Ohio, New York Central lines, Pennsylvania lines, Wheeling & Lake Erie, and the Wabash-Pittsburgh Terminal. The railroads are suffering large loss of revenue through idleness of Ohio mines.

Coal Trade Reviews

General Review

Anthracite situation continues discouraging. Bituminous slow and export business erratic with competition more aggressive. Pittsburgh district firmer due to activity in steel. Full summer dullness prevails in Middle West.

Anthracite prices show no indication of bracing up, although some of the large companies are making an effort to increase operations which would indicate that they believe the dullest part of the year has passed. The individual companies are making heavy concessions on the circular, but they are finding the going hard, most purchasers preferring to deal with the large companies in order to strengthen their connection with them in anticipation of labor troubles next spring. In the meantime the current situation continues discouragingly dull. The storage capacity of the large companies is being taxed to the limit, while the independents are moving a tremendous volume of coal to Tidewater where stocks are already abnormal. The Lake movement continues to decline, and there are persistent rumors of a shortage of storage room at the upper ports.

There is a total absence of any spot demand in the bituminous market and the past week has been one of the worst of the summer. Practically the entire movement is being applied on contracts. Export business is erratic; the Hampton Roads piers are consistently breaking all records, while the movement out of Baltimore has taken a heavy slump and shipments generally are confined more closely to direct contracts while it is noted that a few options for export tonnage have not been taken up. Competition for this business is also becoming more keen, due to the complete lethargy in the general market.

Pittsburgh district operators are slightly firmer in their views as regards prices, due to the beneficial effects resulting from the increased operations at the steel mills. The bituminous movement is apparently increasing and with the large grain shipments now getting underway, it is likely that the pressure on the railroads may be of sufficient proportions to affect the trade. The Lake trade continues discouraging, the only cheerful feature being the possibility of an increase in the August movement.

Generally negative conditions still prevail in the Ohio market. The harvesting of the largest crop in the history of the state is not relieving the pressure in any way although it may help some when the rail movement starts. Industrial conditions are slightly better than during the first half of the year, but this is offset by the extreme caution on the part of the buyers. The stocking season is much behind, and all attempts to force action in this line have met with little success.

The full mid-summer dullness prevails in the Middle Western market, but prices are running somewhat higher than last year, due to the careful restriction in shipments. Intermittent buying of screenings by the large consumers has caused a relapse in this branch. General commercial conditions show some improvement but this is offset by the extreme conservatism in the coal business which is further accentuated by the backwardness in the crops. Heavy war orders continue the most encouraging feature of the market.

A Year Ago—Anthracite trade touches the low point of the year. Firmer tone and improved sentiment in bituminous. Stocks exhausted and buyers finding they have overstayed the market.

BUSINESS OPINIONS

Boston News Bureau—If the new strength of war stocks foreshadows the closing up of additional business, then the market is in a position to receive a fresh impetus, but otherwise an unhealthy situation prevails. The international situation is bound to hang fire for several weeks. In the meantime the index to industrial conditions is best furnished by the heavy advances in the prices of steel products along with tremendous bookings. These tell their own story.

Modern Miller—A very small percentage of winter wheat crop was threshed this week. In a few favored localities threshers were able to work, but in general the wheat is still standing or in the shock drying out. More activity is expected next week. Rain has fallen in Nebraska, Kansas, northern Oklahoma, northern and southeastern Missouri and Ohio. In Illinois, Indiana and Kentucky the crops are rapidly drying out.

Iron and Steel—The speculative orgy in the market for steel stocks has attracted more attention than the improvements at the steel mills, which is noteworthy. The leading interest is operating about 93% of its ingot capacity, compared with 91% a week ago, and some of the independent mills are now at full rated capacity. It is estimated that at least 25% of current operations are for war orders or the like. There is an unusual program of new steel-plant construction projected in and around the Youngstown district. Prices of billets have again advanced, and on some special commodities prices are unusually high. The activity of the steel mills is so great that the situation in ferro manganese promises again to become acute. Activity in the machine-tool industry continues on just as large a scale as ever.

Southern Lumberman — Enlarged activity in industrial lines, settlement of certain local labor trobules with continued absorption of idle working men, further heavy war orders, increase in bank clearings, and the good crop outlook, are all contributing factors.

American Wool and Cotton Reporter—Manufacturers are cheerful over the openings on lightweight goods. The turning point in the market has arrived, it is felt by some. Prices of goods at the openings were based on present market prices for wool. The goods opened at higher prices than a year ago, and a fair volume of sales was consummated.

Dun's—Apart from the development of further labor controversies, the general situation maintains its favorable aspects. Recent settlement of labor troubles in the building trades in the West has been followed by the adjustment of the local clothing strike, but fresh disturbances have arisen here and elsewhere, notably at oil plants in New Jersey.

Marshall Field & Co.—Although weather conditions have not been conducive to normal retail selling throughout the country, the volume of current wholesale distribution has about equaled that of the same period last year. Fewer merchants have visited the market than a year ago.

Bradstreet's—Growing activity in industrial quarters turning out metals and their products, prospects of big crops, optimistic sentiments as to the future, and better collections, contrast with midsummer quiet in the larger merchandising lines, unrest in labor circles, some conservatism, generated by international political matters, and quite slow buying for fall account.

ATLANTIC SEABOARD

BOSTON

Prices on Hampton Roads coals practically unchanged. Export trade still spotty and coastwise market drags. Georges Creek now in plentiful supply. Pennsylvania grades dull and anthracite very quiet.

Bituminous—No improvement can be reported in the market for Pocahontas and New River. There has been no price movement of any kind and those shippers who were offering concessions a week ago are doing so today. Receipts here are about normal but practically every ton arriving is being applied to contract purchases and not being absorbed by any spot market. The latter simply does not exist. It is a good sign that so little coal is being forced on this territory and it gives reason to hope that if things do start up in the fall there will be room here and there for coal. The fact that the trade is in no worse shape than when last reported is also ground for encouragement.

Agents who distribute coal for inland delivery from Tidewater points are still selling at minimum prices. There is much rivalry for this trade in the larger ports like Boston, Providence and Portland, and it is believed that some of those who have rehandling plants of their own are seeking in this way to discourage competition on the part of shippers who must use the facilities offered by the railroads.

While the volume of coal moving off-shore is still large, it is mostly on old sales. New business is not coming in with quite the push it had earlier in the season.

Georges Creek is now in ample supply at all points and contractors in New England are beginning to get their full share of this popular grade. If the off-shore demand improves as it is almost certain to do later on it is likely that Georges Creek will again be in arrears in the coastwise trade.

With the Pennsylvania grades trade is also in a dull state. While for some weeks the quality coals had all the business wanted, the operators are now again looking for orders.

Water Freights—There is little to add to last week's report. Rates depend on conditions that change almost daily. There is a surprising amount of rechartering: i.e., shippers who have tonnage under charter are in several cases turning over barges to other shippers at current market rates; 40c. is still the minimum freight on small barges, New York to Long Island Sound ports like Providence and New Bedford.

Anthracite—July business this year is somewhat ahead of 1914, but there is no life to the demand. The last week of the month is usually less dull and while little is said it is realized that July will stand up pretty well for tonnage, considering we are now in the midst of summer dullness.

Prices on bituminous at wholesale are about as follows:

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines*	$0.85@1.40	$1.15@1.60	$1.67@1.77	
Philadelphia*	2.10@2.65	2.40@2.85	2.92@3.02	
New York*	2.40@2.95	2.70@3.15	3.22@3.32	
Baltimore*	....	....	2.85@2.95	
Hampton Roads*	....	....	....	$2.65@2.80
Boston†	....	....	....	3.55@3.68
Providence†	....	....	....	3.45@3.68

* F.o.b. †On cars.

NEW YORK

Bituminous contract coals moving freely. Spot market quiet. Good demand for export and bunker fuels. Anthracite situation dull. No demand at Tidewater.

Bituminous—Contract coals continue to move freely but shippers report practically no spot demand. Demand for export and bunker coals remains fairly active. New inquiries are being received from France, Spain and Italy and some contracts are reported as having been closed. The end of the month should see as large if not larger export tonnage than in June.

Production in the Pennsylvania regions has been at about half capacity. The local situation shows no improvement. There is a great quantity of unsold coal at the docks while the harbor contains many filled bottoms. Some of the cheaper grades can be bought at about $2.35 f.o.b., fair grades at 15c. more, while the choice grades are quoted at $2.65 to $2.80. Some of the larger New York companies with Philadelphia connections have received inquiries from foreign countries and are preparing to make shipments.

Current quotations are on the following basis·

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.30@3.40	$3.30@3.40	$3.30@3.40	$1.75@1.85
Georges Creek Tyson	2.90@3.00	2.90@3.00	....	1.35@1.45
Clearfield:				
Medium	2.65@2.80	2.55@2.65	....	1.10@1.25
Ordinary	2.55@2.60	2.55@2.60	....	1.00@1.10
Broad Top Mountain				1.10@1.45
Cambria County:				
South Forks	2.90@3.05	....	....	1.35@1.50
Nanty Glo	2.75@2.80	....	....	1.20@1.25
Barnesboro	2.65@2.70	....	....	1.10@1.15
Somerset County:				
Quemahoning	....	2.70@2.85	2.70@2.85	1.20@1.30
Medium	2.65@2.70	2.60@2.65	2.60@2.65	1.10@1.15
Latrobe	2.45@2.55	....	....	.90@1.00
Greensburg	2.75@2.80	....	....	1.10@1.15
Westmoreland	2.95@3.20	....	....	1.15@1.40
West Virginia Fairmont ¾		2.60@2.70	2.60@2.70	.80@ .90
Fairmont mine-run	....	2.50@2.60	2.50@2.60	.70@ .80
Steam	....	2.45@2.50	2.45@2.50	.90@ .95
Western Maryland	....	2.35@2.40	2.35@2.40	.80@ .85

Anthracite—With the passing of the two dullest months of the year, handlers of anthracite coal are looking forward to increased business. A reflection of this optimism may be seen in the efforts of a couple of the large companies to operate their mines six days this week. So far demand has not increased at tidewater and there was not the customary rush of orders during the last week of the month to save the discount.

Shippers are disposing of much coal inland and the Lake trade is calling for regular shipments. The Tidewater docks are well loaded and the number of filled bottoms about the harbor has not decreased. Independent miners continue to send all their surplus coal to Tidewater. The companies are reported as storing considerable of their product.

Concessions continue to be made on some of the prepared sizes. The average price on individual coal has made no material change in several weeks. Occasionally a bargain can be picked up at lower figures than the average quotation.

The steam-size situation is practically at a standstill. There is any quantity of the buckwheat coals on hand. The better grades of Nos. 2 and 3 are very scarce. Pea coal is being stocked.

Current quotations follow:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$4.85		$4.90	
Egg	5.10	$4.70@5.10	5.15	$4.75@5.15
Stove	5.10	4.70@5.10	5.15	4.75@5.15
Chestnut	5.35	5.00@5.35	5.40	5.05@5.40
Pea	3.35@3.50	2.70@2.95	3.40@3.55	2.75@3.00
Buckwheat	2.50@2.75	2.00@2.25	2.55@2.80	2.05@2.30
Rice	2.00@2.25	1.70@1.85	2.05@2.30	1.75@1.90
Barley	1.75@2.00	1.45@1.70	1.80@2.05	1.50@1.75

PHILADELPHIA

Anthracite shows slight improvement, although extreme dullness continues. Nut size remains a burden, with stove the most active. Pea moving fairly well, but other steam sizes are weak. Bituminous has the poorest week of the year.

Anthracite—While there has been a very slight improvement, the trade shows no real prospect of bracing for some weeks yet. This is the dullest season of the year and most dealers are only buying to meet actual needs, although some continue to stock up because of the extremely low prices.

This is particularly true of pea; several dealers continue to buy heavily of this size, taking the stand that they can make a larger margin of profit at the existing prices with less capital invested, than if they put their cash in the domestic grades. Plenty of pea is still moving at $1.50 and there is no trouble at all to buy first grade coal at $1.75.

Chestnut continues to be the real drug of the market, with egg and stove the most active. A large sale of this latter size has been reported at April circular, but this reduction was made on account of carrying a good tonnage of chestnut with it. Chestnut has been freely offered in several instances at 10c. off April circular. The general price fluctuations are from 10c. below April circular to 10c. below current circular for the family sizes.

Collections continue to be a great source of worry, both to the operator and the dealer, and some of the dealers who are urged to take in coal at attractive prices state that they cannot collect enough money to even pay the freight. The steam sizes continue to follow in the trend of the other low prices and can readily be bought at from 10c. to 25c. off the circular. However, the small steam users who have been accustomed to buy their fuel as needed at the prevailing market prices are becoming a little uneasy over the labor outlook and are asking for contracts. Even with offerings at extremely low prices, many of the dealers are declining to buy from the individuals, placing what few orders they have with the larger companies, whom experience has taught them can take care of them in times of trouble in the mining region.

Reports are coming in daily from the mining regions that the men are prepared for the strongest fight—should it come to that—they have ever made. A suspension of two months would benefit the business, as such a condition would enable the market to right itself as to the extremely low prices that have been prevailing for a long time.

The prices ruling the past week, to which should be added the state tax of 2½% per ton, are as follows:

	City	Tide		City	Tide
Broken	$3.20	$4.45	Pea	$2.50	$3.25
Egg	3.45	4.70	Buckwheat	1.25	2.25
Stove	3.70	4.70	Rice	.85	1.75
Chestnut	3.85	4.95	Barley	.50	1.50

Bituminous—The bituminous trade has probably experienced its worst week so far this summer. Mines are on very short time, with practically no demand except on contracts. This continued inactivity of the domestic market has led some of the operators who have never touched export trade to inquire into the possibilities of that line, and it is altogether likely that there will be stronger competition for this trade in the future. The tide shipments this week have continued in good volume to both European and South American ports and the prospects are that the tonnage will continue to increase, although the lack of vessels continues to be more than ever a serious question.

The prevailing prices are as follows:

Georges Creek Big Vein	$1.65@1.75	Fairmont gas, mine-run	$1.15@1.25
South Fork Miller Vein	1.50@1.60	Fairmont gas, slack	.65@ .75
Clearfield (ordinary)	1.00@1.20	Fairmont lump, ordinary	.85@ .95
Somerset (ordinary)	1.00@1.15	Fairmont mine-run	.75@ .85
West Va. Freeport	.85@ .95	Fairmont slack	.45@ .50

BALTIMORE

Falling off in export movement but large movement expected later. Market remains soft, and prices low.

The feature of the coal trade during the past ten days has been the falling off in the export movement. This became rather pronounced the first week of this month but the following two weeks showed somewhat of a gain, although much below the same period of June. Last week saw another slump, and the outlook is probable that only about 200,000 tons will be moved from Baltimore to foreign ports this month; this is a loss of about 100,000 tons from the previous month. Call for bunker fuels is becoming heavier all the time, however, and the tonnage for July will run between 55,000 and 60,000 tons.

Many charters for loading the next 60 days or so are being made, however, and there are some who believe that a new record for foreign shipment will be made during that period.

The domestic trade remains dull, despite talk of activity among firms making war orders. Coal is offering very cheap at the mines. While better grades are moderately firm in Maryland, West Virginia and Pennsylvania at from $1.10 to $1.40, poor to ordinary fuels can be bought at 75 to 85c.

HAMPTON ROADS

Export shipments continue heavy, particularly to Italy. Trial shipments of high volatiles to South American ports.

Coal shipments from Tidewater continue heavy to Italy with a few shipments to South American ports. There is still some shortage of New River and Pocahontas and few shippers are accepting prompt orders. The coastwise movement has been mostly to New England ports although some small shipments have gone to Savannah, Jacksonville and Charleston. Prices on all of the standard grades of New River and Pocahontas remain about at the circular, although there is some shortage.

In addition to the smokeless coals going foreign there has also been some small shipments of high volatile grades to South American ports; these, however, have been more in the nature of trial parcels with a view to introducing American gas coals and it is not believed any large movement can be expected as yet for this coal. The outlook still continues bright for a record month for July, and unless vessel tonnage now due is delayed the coming week's dumpings should be one of the heaviest of the month.

Railroad Tonnages—Dumpings over the local piers for the past several weeks compare as follows:

	Week Ending				
Railroad	June 26	July 3	July 10	July 17	July 24
Norfolk & Western....	213,279	211,017	174,822	180,090	197,913
Chesapeake & Ohio....	79,870	83,678	76,397	116,862	......
Virginian............	87,840	58,455	57,467	78,710	86,523
Totals............	380,989	291,828	308,686	375,662	......

VESSEL CLEARANCES

The following steamers have cleared from Hampton Roads July 16 to 23, 1915:

Norfolk

Vessel	Destination	Tons
Berwind	San Juan, P.R.	3015
Vinland	Rio	5477
Queen Helena	Santa Liberata	5900
Ocland	Cristobal	4800
Tordenskjold[1]	Cristobal	5500
Mariorga Goulandris	Spezia	5186
Gemma	Genoa	4470
Clara A. Davis	Maceio, Brazil	1096
Andrea	Savona	5000
Eleanora Maersk	Copenhagen	2677
Polynesia	Leghorn	2633
Luigi Ciampa	Civita Vecchia	5000
Sava (bark)	Naples	1641
Harald	Curacao	4500
Wm. E. Litchfield	Puerto Plata	736
Ellen S. Little	Pernambuco	2000
Torrington	Genoa	7500
Florence Howard	Pernambuco	1318
M. D. Cressey	Bahia	2975
Hornelen	Buenos Aires	4930

Newport News

Vessel	Destination	Tons
Rhydiven[2]	Taranto	6700
Campeiro	Maddelena	4400
Nolisment	Genoa	7500
Dorington Court	Spezia	7000
Magnus Manson	Pernambuco	2410
Apsleyhall		6300
Verdun	Rio de Janeiro	7200
Malm	St. Jago	1700
Hackensack	Tiburon	3200
Panaghi Vagliano	Italy	4200

Note—Steamers are indicated by **bold face** type, others being barks and schooners.

[1] Smokeless Fuel Co. [2] Berwind-White C. M. Co.

The following vessels cleared with coal from New York Harbor during the week ended July 21:

Vessel	Destination	Tons
Matura	Port of Spain	140
Geo. B. Cluett	St. Anthony	87
L. P. Whitmore	St. John	438
Siberia	Frontera	50
Timandria	Rio de Janeiro	455
Francis Sawyer	St. John	598
Jost	Yarmouth	350

Note—Steamers are indicated by **bold face** type, all others being schooners.

Clearances for foreign ports from Baltimore for the week ending July 24 were as follows:

Vessel	Destination	Tons
Andrea Costa	Italy	4,885
Driebergen	Cuba	2,802
Oceano	Italy	5,777
Urubamba	Peru	146
St. Dimitrios	Greece	5,220
Styliani Bebis	Italy	5,514
Drammensfjord	Norway	2,907
Cleanthis	Italy	4,738
Totals		31,989

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	To	Tons	Rate
J. Manchester Haynes	Wilmington	683	
Dalmore	Marseilles	3048	
Hamborne	Santiago	742	
A. B. Sherman	Savannah	950	$1.10
R. M. Thompson	West Indies	1605	
Stormount	Antilla	1231	
Camilla May Paige	Mayport	567	1.00
Harold B. Cousins	St. John, N.B.	360	
Moama	St. John, N.B.	384	
Norther	Marseilles	2912	

BALTIMORE

Vessel	To	Tons	Rate
Stryn	Malmo	1315	
Frederick Knight[2]	River Plate	2322	8.28[1]
Blackfriargate[2]	River Plate	1758	8.28[1]
Pennine Range	Montevideo[3]	2215	8.16
Fannie Palmer	San Juan		
Fert	Spezia		8.88
Fagersand	Point-a-Pitre	486	
Eleni Stathatos	Palermo		9.84
Sydic	Sweden	2560	
St. Andrews	Montevideo	3054	
Oleanthis	Italy		
Three Marys	Porto Rico		

BALTIMORE—(Continued)

Vessel	To	Tons	Rate
T. J. Hooper	Mayport		
Fagersand	Guadaloupe		
Isle of Jura	Alexandria	2485	

[1] July and Aug. [2] Or Virginia. [3] Option Buenos Aires or La Plata $8.28 Aug.

ATLANTIC RANGE

Vessel	To	Tons	Rate
Polamhall	Italy[1]	2581	$9.84
Anne Lord	St. John, N.B.[2]	246	

[1] Five trips. [2] Thence Rerring Cove to Philadelphia with lath.

VIRGINIA (Inc. Hampton Roads)

Vessel	To	Tons	Rate
Isthmian	Caleta Colosa	3464	$6.30
Frederick Knight[2]	River Plate	2322	8.28[1]
Blackfriargate[2]	River Plate	1758	8.28[1]
Andreas Gerakis	Italy	1939	8.76[1]
Chas. G. Endcott	Maranham	751	6.50
Marcus L. Urann	Rio Janeiro	1576	
E. S. Greeley	Pernambuco	1198	
Chas. A. Campbell	Para	1493	

[1] July and Aug. [2] Or Baltimore. [3] Option Buenos Aires or La Plata $8.28 Aug.

Note—Steamers are indicated by **bold face type,** all others being schooners.

OCEAN FREIGHTS

The number of steamers available for coal has decreased materially and the freight market is considerably firmer, owing to the increased demand for steamers for grain. Owners are not willing to accept shippers' views on these grain freights, but shippers are advancing their ideas, and probably a number of steamers will be chartered for grain in the near future.

This grain demand makes it difficult to quote probable freight rates on Mediterranean coal with any degree of certainty. We would quote freight rates on coal by steamer as follows:

To	Rate	To	Rate
Havana...............	$2.00@2.25	Bermuda..............	**$3 00**
Cardenas or Sagua......	**2.75@3.00**	Vera Cruz.............	3.25@3.75
Cienfuegos............	2.75@3.25	Tampico..............	3.25@3.75
Port au Spain, Trinidad.	3.50	Rio..................	8.40@8.64
St. Lucia..............	**3.25@3.50**	Santos*..............	8.40@8.88
St. Thomas............	3.00	Montevideo...........	8.22@8.34
Barbados...............	**3.50**	Buenos Aires or La Plata	8.28@8.40
Kingston..............	2.75@3.00	Rosario..............	8.64@8.88
Curacao...............	3.25	West Coast of Italy.....	8.88@9.60
Santiago..............	2.50@3.00	Barcelona**...........	8.16@8.64
Guantanamo...........	2.50@3.00	Valparaiso or Callao....	6.25@6.50
Demerara..............	**4.25@4.50**	Marseilles............	8.64@9.12

Note—Rates noted in **bold face** type are only approximate.
* Consignees paying dockage dues. **Spanish dues for account.
W. W. Battie & Co.'s Coal Trade Freight Report.

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge. 24c. per net register ton per day demurrage."

LAKE MARKETS

PITTSBURGH

Manufacturing demand increased. More export demand for Connellsville. Prices a shade firmer. Operations at 50 to 55% of capacity.

There has been a further improvement in demand for coal from manufacturers, particularly in the iron and steel industry, which is now operating at more than 90% of capacity, in the case of western Pennsylvania and eastern Ohio, though the steel industry as a whole is operating at somewhat under 90%. The increased demand noted is almost wholly on contracts and does not operate to stiffen the market materially.

The demand for Connellsville coal for export has increased and operators who have participated in this trade of late are somewhat firmer in their views as to prices. Shipments in the Lake trade continue light and altogether unsatisfactory, but in some quarters predictions are made that August will show a material improvement. As a result of heavier manufacturing demand and light Lake shipments slack is a shade stiffer, and Youghiogheny gas slack readily brings 55c., slack from other divisions going at about 50c. Mining operations in the district are at 50 to 55% of capacity.

While prices are not quotably changed except on slack the market seems to be firmer all around, at the following levels for prompt coal: Slack, 50@55c.; nut and slack, 90@95c.; nut, 95c.@$1; mine-run, $1@1.05; ¾-in., $1.10@1.15; 1¼-in., $1.20@1.25, per net ton at mine, Pittsburgh district. On contract to Apr. 1 the market on mine-run seems to be from $1.05 to $1.15.

BUFFALO

Increased activity in bituminous and still more anticipated soon. Price advances will be slow as the natural output is large and all operators are eager to increase their trade. No improvement yet in anthracite.

Bituminous—The volume of bituminous moving appears to be steadily increasing and there should be a constant improvement from now until fall. Grain will soon begin to move and it is expected that there will be enough demand on the railroads to affect coal. There is no better call for slack, but there are not quite so many reports of cut prices and the general improvement is no doubt helping it some.

The Canadian situation is not materially improved; in fact the latest report from there notes the shutdown of a mill that had for a long time bought coal in considerable quantity here. The additional tariff, the reduction in the price of Canadian coal and the lessened consumption, all contribute to cutting down sales in that direction. Prices continue on the basis of $2.70 for best Pittsburgh lump, $2.55 for three-quarter, $2.45 for mine-run and $2.25 for slack, with slack less firm than sizes.

Anthracite—The demand does not improve. All branches of the trade appear to be dull now, so that the mines have no other alternative than to run slow and they are turning out less coal than for a long time. There is a fairly good report from some of the independent mines. By making an extra effort to push their coal on the road and by preparing it as well as they can, they are able to keep running. If they can do that now they should do a fair trade till the fall demand sets in.

There is considerable dropping off in Lake shipments which, till within a week or two, had kept up well. There is report that storage space is short at the receiving ports. The vessels have loaded only 80,900 tons here during the past week.

TOLEDO

Pocahontas supply still less than the demand and prices are holding to list. Domestic and steam grades slow. Lake movement still light.

A little stronger Lake market and other lines at a standstill are the salient features of the local market. Domestic trade is slow and even the anthracite movement is extremely light in spite of the fact that this is the period when contract coal is usually being put in. The threshing season is now on full with one of the biggest crops known in this section, but the additional demand has scarcely been noticed.

Kentucky coal seems to have held up as well as anything in the domestic lines. Anthracite is selling off the circular, which is an unheard of situation at this point. West Virginia prices are so low that they are moving the best; Pocahontas No. 3 is the exception this grade holding at full list prices. The Lake shipments are holding up well and there was a little spurt during the past week due to the regular August increase in the circular. There is little demand for smokeless coal outside of the Pocahontas grades and the situation is generally weak. Little Youghiogheny is sold on this market and Pittsburgh No. 8 is going at the buyers' price.

COLUMBUS

Production shows no increase and conditions are generally unsatisfactory. Buyers cautious and a reaction in prices seems imminent. Lake movement a big disappointment.

Efforts to force the backward stocking season are not meeting with much success in the case of the domestic coals. Production in Ohio fields has increased little, if any. West Virginia and Kentucky operators also, find conditions very unsatisfactory in this market. Under these circumstances there is considerable sacrifice of prices.

There is a slightly better feeling in the steam trade most factories working better time than during the first half of the year. This is offset in a measure by the cautious buying of public service plants and other large consumers, particularly in the matter of fine coal. The opinion is generally held that prices, which have so far been well maintained are going to break in the near future. The production of domestic lump will be much increased shortly, owing to limited stocking up to the present time, and this will create a surplus of screenings. Absence of any large Lake shipments either in the Hocking Valley or Eastern Ohio has been a big factor in holding up West Virginia nut, pea and slack to from 15 to 20c. above normal.

It now seems almost a certainty that the Hocking valley will have no Lake season in the real sense of the word. Beginning at about this date last year, when the new mining scale was signed, about 600,000 tons were sent to the docks before navigation closed. The dock movement at Toledo is slow. During the week ending July 19 but 51,069 tons were handled. The total tonnage for the season up to that date is 961,462. Slow movement by rail to the interior in the Northwest still keeps the upper docks in a congested condition.

Prices in Ohio fields are:

	Hocking	Pomeroy	Kanawha
Rescreened lump	$1.50	$1.60	.....
Inch and a quarter	1.35	1.35	$1.30
Three-quarter inch	1.25	1.30	1.25
Nut	1.15	1.25	1.15
Mine run	1.10	1.10	1.05
Nut, pea and slack	.70	.75	.65
Coarse slack	.60	.70	.55

Mines have been working at about the following percentages of full capacity.

District	Week Ended July 3	July 10	July 17	July 24	District	Week Ended July 3	July 10	July 17	July 24
Hocking	25	20	25	25	Cambridge	20	25	35	25
Jackson	25	15	25	20	Masillon	15	25	30	25
Pomeroy	30	45	40	40	Eastern O.	40	60	50	55
Crooksville	55	30	20	20	Average	30	31	32	30

CINCINNATI

Improving demand for prepared grades, especially for the Lake ports, but steam business is still slow, with virtually no market.

A slightly improved domestic market is noted and the Lake movement is also picking up quite perceptibly. The certainty of a normal domestic consumption is moving the coal ,although the volume is restricted. The market, however, is still very far from normal. The increased production of screenings resulting from the domestic improvement has weakened the steam market still further and heavy price concessions are noted both on contract and spot coal. While the machine-tool and related lines are running overtime, as a result of war orders, few other manufacturers have much to do.

CLEVELAND

Coal receipts increased somewhat, but prices continue firm and slightly stronger on fine coal. Retailers book orders for number of orders ahead.

Receipts of coal are larger than at the opening of last week, but the demand pretty well cleaned up the market Monday. Pittsburgh coal brought $1.55 and Youghiogheny as high as $1.65. Sales for shipment are being made at slightly better prices, and the demand for fine coal seems to be growing. The large steam consumers who have been dependent upon orders for war materials are continuing to take as much fuel as they have been and manufacturers of lines not sold as war material are taking a little more coal.

The demand for coarse coals continues light. The market has been cleaned up and the low priced Ohio No. 8 that was offered a week ago has disappeared. There is some West Virginia No. 8 at $1.80 for three quarter, but not enough to disturb prices.

The Lake business shows no change; it will be three weeks at least before it begins to increase.

Retail dealers are booking considerable business, but the delivery is being delayed as customers are not taking the coal. There seems to be no hurry to take coal that commands a discount for delivery and payment prior to Sept. 1.

Quotations for shipment are:

	Pocahontas	Youghiogheny	Bergholz	Fairmont	Ohio No. 8
Lump	$3.45	......	......	....	......
Lump, ¾ in.	.....	$2.15	$1.90	$1.85@1.90	$1.85@1.90
Egg	3.45	......	......	....	......
Mine run	2.65	2.05@2.10	1.80	1.80	1.75@1.85
Slack	......	1.60	1.55	1.55	1.55

LOUISVILLE

Mine operations continue much curtailed. Substantial cut in retail prices being considered.

Negative conditions continue in the Kentucky coal trade, with little or no improvement in any direction. Mines in Eastern Kentucky are reported to be averaging from two to three days a week, while those in the western part of the state are making about a day less. The demand from the cotton seed crushing mills in the South is developing, but the ice factory trade throughout the whole section is less than normal. The retail stocking, movement is not a big item, as yet, and it is stated that a sharp reduction in the retail price is to be made.

Prices, f.o.b. mines are based on from $1.35 to $1.90 for block, while nut and slack range 30 to 40c. and 50 to 60c. according to grade. Western Kentucky screenings are to be had in considerable quantities.

COKE

CONNELLSVILLE

Better outlook, additional merchant furnaces being expected to blow in, and quotations are stiffer. Production and shipments approximately the same as at the beginning of the month.

Prospects have improved for an increased demand for furnace coke as the pig-iron market has taken such a turn as to suggest that several additional furnaces will soon blow in. Ella furnace at West Middlesex, controlled by Pickands Mather & Co., is expected to blow in early in August, while the third of the Shenango furnaces is likely to go in at about the same time.

An Eastern consumer has contracted for 6500 tons of furnace coke a month for three months, the price being in the neighborhood of $1.75. For longer delivery periods the operators are disposed to quote on a sliding scale basis, depending on the price month by month of basic pig iron at valley furnaces. Spot furnace coke has stiffened again as shipments on contracts are somewhat better and there is little free coke available. We quote: Prompt furnace, $1.70; contract furnace to Oct. 1, $1.75; contract furnace to Jan. 1, $2; prompt foundry, $2.25@2.40; contract foundry, $2.25@2.60, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ending July 17 at 371,144 tons, an increase of 30,402 tons, and shipments at 365,615 tons, an increase of 35,542 tons. The increases represent the recovery after the holiday week.

Buffalo—There is some advance in the price of coke, though it does not appear to have materialized in this market to any great extent. So long as steel continues to do well there will be a liberal output of coke, though prices may not be very strong. There is frequent report of new ovens firing up, which shows confidence in the market, though it is easy to overdo it. Quotations are stronger on the basis of $4.25 for best Connellsville foundry and $3.30 for stock coke.

Chicago—Coke prices have shown somewhat of a tendency to stiffen during the past week, with the greatest strength in foundry sizes. Byproduct sizes are in better demand, and prices have steadied. Quotations are as follows: Byproduct, $4.55@5.10; Connellsville, $4.75@5; Wise County, $4.65; gas coke, $3.75@3.90, furnace, $4.65@4.75.

MIDDLE WESTERN

GENERAL REVIEW

Demand quiet with prices fairly well maintained. Screenings slightly softer. Anthracite still backward.

Midsummer dullness has prevailed this week, and the expected revival of buying over the month end has not materialized. There is but little spot coal on tracks. Shipments to the country districts have not been so large as expected, due to the backwardness in the crops. General commercial conditions show betterment, but extreme conservatism prevails in the retail trade and among large industrial buyers.

Prices are holding firm because of the close restriction of shipments, although some operators state that current quotations do not allow them sufficient margin to show a reasonable profit. Nevertheless, it is admitted that prevailing prices are better than they were at this time last year. It is anticipated that August orders will be larger and at better prices, because of the small shipments thus far. The movement of Lake coal has increased during the past two weeks.

CHICAGO

Market somewhat heavier and prices lower. West Virginia grades continue the leaders. Anthracite unusually weak.

Franklin and Williamson County domestic shipments have been smaller this week, and it is reported that some coal has gone forward at from 10c. to 15c. per ton under circular prices, although generally the $1.50 price is maintained. Saline County domestic lump usually sells at $1.35, but an increasing number of shipments are noted from Williamson County at $1.25. Most of the screenings from Southern Illinois mines have been averaging 75c. per ton.

In the Springfield district orders for domestic lump have been very slow, although the operators are endeavoring to maintain the $1.50 price. It is reported that a number of sales have been made at 25c. under this figure during the past week. Screenings from the Springfield district have been steady at around 70c.

The output of Indiana domestic coals has increased slightly. Industrial shipments from the Indiana mines show little betterment, but the operators are confident that the fall trade will bring a decided revival in this class of business. The demand for Fourth Vein Indiana coal has been steady at fair prices, while Fifth and Sixth Vein grades have been very quiet. Some shipments for threshing trade have been moving to Iowa and Northwestern points.

Prepared sizes of Pocahontas and West Virginia smokeless coals continue strong, egg coal being easier than the others. Mine-run has stiffened, and most of this grade is selling at $1.25. Splint coals show no improvement, and prices quoted show a wide range. Splint nut and slack has been as low as 45c. per ton, f.o.b. cars at the mines for spot shipment.

The Pennsylvania smokeless demand has receded, but there is no demurrage coal to be absorbed. The demand for egg and nut has been very slow.

The circular price for Hocking lump is $1.50, but to meet the strong competition from West Virginia and Kentucky coals, shipments have been going forward at an average discount of 25c.

Kentucky grades are still in a bad way. The demand for Kentucky block has been more active, but there is practically no movement of other sizes.

Anthracite is fully as backward as bituminous grades. Lake shipments have declined in volume, being much less than for several weeks past. Shipments to far Western points have been made this week at discounts of from 25c. to 35c.

Quotations in the Chicago market are as follows:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump......	$1.35@1.50	$1.25@1.50	$1.35@1.50	$1.25@1.50	$1.40@1.50
Steam lump	....	1.15@1.25	1.10@1.15	1.15@1.25	1.15@1.25
2½-in. lump.	1.25	....	1.25@1.35	1.25@1.35	1.30@1.35
1¼-in. lump.	....	1.25	1.20@1.30	1.15@1.25	....
Egg	1.25@1.50	1.25@1.35	1.15@1.25	1.10@1.15	1.15@1.25
Nut	1.25@1.35	1.10@1.25	.95@1.05	.90@1.05	1.00@1.05
No.1washed	1.25@1.50	....	1.45@1.50	....	....
No.2washed	1.25@1.35	....	1.35@1.40	....	....
No. 1 nut..	1.35@1.50	....	....	....	....
No. 2 nut..	1.25@1.35	....	....	....	....
Mine-run...	1.15@1.25	1.00@1.10	.85@ .95	.90@1.00	.85@1.05
Screenings..	.70@ .80	.65@ .75	.60@ .75	.65@ .75	.70@ .80

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump......	$1.25@1.35	$1.35@1.75	$1.90@2.00	$1.40@1.60	$1.35@1.50
1¼-in. lump.	1.10@1.25	1.25@1.50	....	1.25	1.25@1.35
Egg.......	1.25@1.35	1.10@1.35	1.75@1.90	1.35@1.50	....
Nut.......	....	.90@1.10	1.40@1.60	1.25@1.35	1.15@1.25
No. 1 nut..	1.25@1.35	....	....	....	....
No. 2 nut..	1.25@1.35	....	....	....	....
Mine-run...	1.10@1.15	1.00@1.15	1.15@1.25	1.00@1.25	1.15@1.25
Screenings..	.65@ .75	.65@ .75	....	....	....

Receipts by Lake—Arrivals by Lake for the week to July 26 and for the month and season to date were as follows:

From	1915		1914	
	Anthracite	Bituminous	Anthracite	Bituminous
Buffalo................	13,642	....	26,060	8,400
Toledo................	....	10,023	....	20,500
Ashtabula.............	....	2,400	....	....
Cleveland.............	....	5,546	....	....
Oswego................	....	....	2,348	....
	13,642	17,969	28,408	28,900
July total to date........	105,153	45,674	111,627	69,898
Season total to date.....	363,399	209,244	282,880	325,987

INDIANAPOLIS

Screenings are lower, the supply exceeding the demand temporarily. Retailers more active. Steel and related industries very busy and consuming large quantities of coal.

An easing off in the price for screenings is the only feature of interest in the Indiana coal industry. Nos. 5 and 6 are now selling at 65 to 70c. Operators are unable to account for this, though the cause apparently lies in Chicago. The buying there is not constant and if big purchasers stay out of the market for a few days, the effect is immediately noticeable. During these periods, the supply exceeds the demand and some sellers, alarmed by the surplus, are tempted to make concessions.

The demand for domestic lump is slightly better, the retail yards having been forced to replenish supplies. The movement as yet to the railroads has not shown the acceleration due to crop-marketing times, as yet the weather having been a delaying factor. The activity at Gary, Kokomo, Anderson and other cities where there are steel manufactories has increased. At Kokomo, where the auto factories are working on war, as well as domestic business, the factory buildings are not adequate and tents have been erected. Retailers report an increasing movement to consumers' bins.

ST. LOUIS

Some domestic coming in but screenings continue to drag. Mt. Olive mines suspend operations for 30 days.

Domestic orders are beginning to come in for lump and egg coal, cutting off the demand for nut, which has become a drug on the market. Screenings are still at the bottom of the price list for some unexplained reason. The Mt. Olive mines are closed down for thirty days and consumers of this grade are being supplied with Staunton coal. There have been numerous changes in prices during the past week and quotations are now as follows:

	Wilm. & Frnk. Co.	Sparta	Mt. Olive	Standard
6-in. lump	$1.25@1.35	$1.25	$1.25@1.35	$0.95
2-in. lump	....	.95	1.25	.85
3-in. lump	....	....	1.25@1.35	....
3x6 egg	1.25@1.35	....	....	.85
No. 1 nut	1.15@1.20	....	....	....
No. 2 nut	1.00@1.05	....	....	....
No. 1 washed	1.35	....	1.35	....
No. 2 washed	1.25	....	....	....
No. 3 washed	1.15	....	....	....
No. 4 washed	1.10	....	....	....
No. 5 washed	.80	....	....	....
Screenings	.65@ .75	.70	....	.65@ .70

KANSAS CITY

The retail market has shown very little activity during the past week, though it has picked up to a slight extent. It is understood that prices will be advanced on the first of August. The wholesale market has been slightly better and retailers are pushing strong for business by energeticly advertising their product.

Prices for July delivery are as follows:

Bonanza smokeless (semi-anthracite)	$6.00	Penn. anth. (furnace)	$10.50
Cherokee lump	4.25	Penn. anth. (stove)	11.00
Cherokee nut	4.00	Arkansas anth. (furnace)	8.00
Missouri block	4.00	Arkansas anth. (stove)	8.50

PRODUCTION AND TRANSPORTATION STATISTICS

IMPORTS AND EXPORTS

The following is a comparative statement of coal imports and exports of the United States for May, 1914-15, and for the eleven months ending April, 1913-14-15, in long tons:

	May		Eleven Months		
Imports from:	1914	1915	1913	1914	1915
United Kingdom	551	957	8,750	10,684	33,919
Canada	55,410	77,213	1,255,854	938,182	1,036,285
Japan	410	4,510	78,812	83,851	77,490
Australia and Tasmania	3,136	6,040	140,825	230,081	160,947
Other countries	183	420	3,257	3,613	2,248
Total	59,690	89,140	1,487,498	1,256,411	1,310,889
Exports:					
Anthracite					
Canada	469,441	412,479	4,131,075	3,469,646	3,269,000
Uruguay	....	....	....	84	....
Other countries	6,042	10,215	73,741	56,119	60,552
Total	475,483	422,694	4,204,816	3,525,849	3,329,552
Bituminous					
Italy	....	285,027	....	....	1,245,260
Canada	705,562	589,512	10,563,330	10,678,541	7,551,864
Panama	22,150	34,321	443,249	336,617	295,664
Mexico	20,951	30,247	406,249	280,526	369,166
Cuba	82,851	107,650	1,167,681	1,048,379	990,222
West Indies	50,824	34,471	550,055	532,108	413,486
Argentina	11,078	108,730	....	129,432	406,058
Brazil	16,391	65,183	....	229,059	404,780
Uruguay	11,581	14,401	....	56,252	91,671
Other countries	162,425	134,735	1,060,966	1,228.486	711,414
Total	1,083,813	1,404,277	14,191,530	14,519,400	12,479,585
Bunker coal	674,805	647,918	6,666,494	7,124,527	6,334,773

NORFOLK & WESTERN RY.

The following is a statement of coal handled by the N. & W. Ry. during June and the past four months in short tons:

	March	April	May	June
Pocahontas Field	1,003,437	1,163,948	1,259,992	1,493,776
Tug River District	282,886	285,243	322,881	348,737
Thacker District	227,817	245,887	278,775	238,688
Kenova District	66,605	112,076	90,642	81,794
Clinch Valley District	144,031	138,970	144,576	155,689
Other N. & W. Territory	2,478	3,271	2,323	3,418
Total N. & W. Fields	1,727,254	1,949,395	2,099,189	2,322,102
Williamson & Pond Creek	48,052	55,311	84,086	75,573
All other railroads	129,446	195,845	251,339	282,790
Grand total	1,904,752	2,200,551	2,434,614	2,680,465

BALTIMORE & OHIO

The following is a statement of coal and coke tonnage moved over this system and affiliated lines during June and the previous two months:

	April		May		June	
	1915	1914	1915	1914	1915	1914
Coal	2,159,914	2,131,812	2,564,481	2,357,119	2,883,959	2,380,795
Coke	289,369	343,962	297,897	301,163	329,130	298,237
Total	2,449,283	2,475,774	2,862,378	2,658,282	3,213,089	2,679,032

I. C. C. Decisions

I. C. C. Nos. 5919, 5920—Alpha Portland Cement Co. vs. Baltimore & Ohio R.R. Co., et al. Baltimore & Ohio R.R. Co., et al. vs. Pennsylvania R.R. Co

1. Rate of $2 per gross ton for the transportation of bituminous slack coal in carloads to Martins Creek, Penn., from mines in the Fairmont region of West Virginia and in the Westmoreland region of Pennsylvania, not found to be unreasonable or unjustly discriminatory.

2. The requirement of a differential between slack and other sizes of bituminous coal not found to be justified.

I. C. C. No. 6796—San Toy Coal Co. vs. Akron, Canton & Youngstown Ry. Co., et al.

1. Complainant attacks as unreasonable and unduly discriminatory defendants' rates on bituminous coal in carloads from San Toy, Ohio, and other points in the Crooksville, Ohio, coal district to Chicago, Ill., and to points in the states of Illinois, Indiana, and Michigan. Upon the facts disclosed of record: **Held,** That the rates unjustly discriminate against shipments from mines of complainant and others located in the same district in favor of mines located in the middle district of Ohio. Defendants required to remove the discrimination.

2. Complaint is also made of rates from San Toy and other points in the Crooksville district to Lake Erie ports for transshipment; **Held,** That the evidence fails to show that the rates complained of are unreasonable or otherwise in violation of law.

I. C. C. No. 6271, Monroe Coal Co. et al. vs. Chicago & Eastern Illinois Ry. Co. et al.

Rate of 87c. per ton on coal to Chicago from mines in the Sullivan-Linton group of Indiana found not to be unduly discriminatory as compared with the rate of 77c. applicable to the same destination from mines in the Brazil-Clinton district of Indiana. (For a detail analysis of the Illinois and Indiana freight rates see p. 1056 of Vol. 7.)

I. C. C. No. 7408—Reeves Coal Co., vs. Pere Marquette R.R. Co., et al.

A shipment of bituminous coal en route from La Follette, Tenn., to Vermilion, S. Dak., was ordered reconsigned to Ghent, Minn. Defendants failed to effect the reconsignment, and higher charges were collected than would have accrued if complainant's instructions had been followed. Reparation awarded.

FOREIGN MARKETS

GREAT BRITAIN

July 16—The two important events of the week in the coal industry have been the issue of the text of the new Price of Coal (Limitation) Bill, which has naturally been freely and widely discussed, and the strike of the miners in South Wales. Both have interfered with business materially. With regard to the former, the announcement in the House of Commons yesterday disposes of the controversy as to whether the Bill applies to coal not yet delivered under existing contracts. It does not. Contracts made before the passing of the Act are unaffected by it. As for the strike in South Wales, a speedy resumption of work is expected, but it is pointed out that should the men prove deaf to the appeals of patriotism and reason the Government, while unable to punish thousands in any other way might lay an embargo upon the funds of the unions, and make it penal to either distribute or receive money which there is reason to believe is to be used for strike pay. The stoppage of supplies should prove a potent check to the strikers if such action becomes necessary.—"The Iron & Coal Trades Review."

July 16—The whole of the Welsh coalfield being on stop since yesterday, business has come to a standstill. Hopes are entertained that better counsels will prevail, and that the meeting today between the Government and the representatives of both sides will be the means of arranging matters so that work can be resumed at once. Quotations are nominal.

Freights—Chartering is, if course, also at a standstill, but some little business is being done in anticipation of an early settlement of the dispute. Rates are approximately as follows:

Gibraltar	$3.84	Naples	$5.37	St. Vincent	$4.80
Marseilles	4.64	Alexandria	6.00	Rio de Janeiro	6.72
Algiers	4.27	Port Said	5.88	Monte Video	6.00
Genoa	5.28	Las Palmas	4.56	River Plate	6.24

Financial Department

Lehigh Coal & Navigation Co.

President S. D. Warriner reports for the year 1914 as follows:

As a result of the inauguration of operations at the new power plant of the Lehigh Navigation Electric Co., the Lansford power house of your company has been closed and power is now being purchased from the Lehigh Navigation Electric Co. The increased amount of current available has permitted a more complete electrification of the plants of your company at points where economies may be realized. An electric hoist has been installed at No. 5 Shaft and is now in successful operation. The new shaft at Rahn Colliery has been equipped with two sets of electric hoisting apparatus, and electric pumps and air compressors are being installed. On the completion of this installation, the boiler plant at this colliery will be abandoned. The increased use of electric fans has allowed the abandonment of long steam lines, thereby securing material economy.

RESULTS FOR CALENDAR YEARS.

	1914—Gross	—1913	1914—Net	—1913
Coal	$12,115,852	$11,279,914	$761,374	$464,746
Canals	211,627	213,490	loss 35,160	loss 57,645
R.R. rentals received	2,608,103	2,646,414		
Investments	902,621	441,802	3,315,405	3,328,727
Miscellaneous	329,852	713,067		
Total	$16,168,055	$15,294,687	$4,041,619	$3,735,828
General administrative expenses			134,694	136,656
General taxes			233,251	232,459
Interest on funded debt			1,175,567	953,034
Other interest			14,528	41,168
Dividends paid (8%)			2,124,636	2,124,636
Balance, surplus			$358,943	$247,875

BALANCE SHEET DEC. 31

Assets	1914 $	1913 $
Coal lands, mines and property	18,256,963	17,456,799
Canal property	3,403,479	3,414,857
Real estate	1,055,934	1,018,753
Physical property	16,048,549	16,847,133
Securities pledged	12,973,072	7,988,311
Securities unpledged	4,375,438	6,286,786
Sec. uncontrolled cos. pledged	....	432,750
Co.'s securities pledged	2,199,000	3,399,000
Bonds and stocks in treasury	x1,845,700	423,513
Sec. of uncontr. cos.	....	638,066
Cash	1,334,696	984,444
Customers' acc'ts	1,680,470	1,231,306
Coal stock	1,697,166	1,188,295
Materials and supplies	336,707	383,976
Sundry debtors	606,587	512,958
Miscellaneous	4,538	25,813
Susp. deb. items	569,634	281,161
Total	66,387,933	62,513,921

Liabilities	1914 $	1913 $
Capital stock	26,587,650	26,587,650
Funded debt	30,668,000	26,515,333
Loans and acc'ts pay	....	978,975
Audited vouchers and payrolls	967,993	909,550
Sundry creditors	33,089	884,059
Matured bond interest	402,072	177,301
Accrued taxes	569,568	378,156
Accrued bond interest	53,614	69,895
Mat. and accr. rents	2,828	2,802
Divs. unclaimed	7,633	6,991
Susp. credit items	107,581	63,466
Deprec. and other res.	4,597,815	4,055,359
Profit and loss	y2,390,090	1,884,384
Total	66,387,933	62,513,921

x Includes stocks in treasury, $29,700 yearly, and bonds in treasury, $1,816,000 in 1914 against $393,813. y After adding sundry accounts adjusted, $146,763.

The sales of coal during 1914 amounted to 3,572,641 tons, an increase of 43,547 tons compared with the year 1913. Market conditions in 1914 were not satisfactory, owing in part to the mild weather during the early months of the year, and, while mining was continued during the summer with a fair degree of steadiness, in the latter months an overproduction in the market caused more or less suspension of mining operations. The slight increase in the sales of coal for the year, in the face of the unfavorable market conditions, was due to the energetic development of additional markets for your company's coal.

The net revenue derived from coal during the year was $761,373, an increase of $296,627 as compared with 1913. This increase was due to the economies realized in the more efficient operation of your company's mines as well as to the higher average rate of production per breaker hour operated.

The production of coal in 1914 from the lands of the Alliance Coal Mining Co., in which your company owns a substantial interest, was limited entirely to the operations of the tenants of that company under lease, the operation of the Alliance Colliery having been suspended throughout the year.

The total tonnage carried on canals during the season of 1914 was 349,586 gross tons, of which 242,587 gross tons were anthracite coal. There were 14,321 gross tons more of anthracite coal transported in 1914 than in 1913, and 17,976 gross tons more of miscellaneous tonnage, the latter increase being due to increased shipments of coal recovered from pools in the Lehigh River. The net loss resulting from canal operations for the year was $35,160, as compared with a net loss of $57,645 for the year 1913. The amount charged to operation on account of depreciation of plant and property was $18,992, as compared with $18,000 in 1913.

As mentioned in the last annual report, the Panther Creek R.R., formerly operated by your company in the Panther Creek and Nesquehoning Valleys, was sold to the Panther Creek R.R. Co., which was subsequently merged and consolidated with the Lehigh & New England R.R. Co. Your company is, therefore, no longer engaged, directly or indirectly, in the railroad transportation business.

During the year, your company increased its holdings of Lehigh & New England R.R. Co. stock by the purchase of 27,100 shares, and now owns 119,950 shares of the par value of $5,997,500. Dividends on this stock aggregating $425,600 were received during the year; this amount, together with the rentals paid by the Central R.R. Co. of New Jersey, and other dividends and interest received upon railroad stocks and bonds owned by your company are included in miscellaneous revenues.

The construction of the Lehigh Navigation Electric Co.'s power plant at Hauto, Penn., and its sub-station at Siegfried, Penn., together with the main transmission and distribution lines, was completed and placed in full operation on May 1, 1914. The plant is being operated steadily at about half its capacity, producing an average of over 200,000 kw.-hr. per day, which is sold to consumers with which connections have been made during the year. The amount of power sold is gradually increasing, and negotiations are under way which it is hoped will soon provide a market for the entire capacity of the present installation.

Note—For previous annual report of this company see Vol. 5, p. 754.

⁂

The Consolidation Coal Co. in 1914

Retiring directors of the Consolidation Coal Co. were reëlected at the annual meeting of the stockholders. Under the company's charter the stockholders also vote directly for officers, who were reëlected as follows: President, J. H. Wheelwright; vice presidents, F. S. Landstreet and G. T. Watson, and chairman, C. W. Watson. There was no other business transacted. No reference was made to Rockefeller interests.

The annual report for the year ended Dec. 31, 1914, showed the income account as follows:

	1914	1913	1912
Total income	$14,828,980	$15,443,246	$14,520,416
Net	3,392,645	3,826,703	3,746,890
Interest and sinking fund	1,382,913	1,366,974	1,243,531
Balance	*2,009,732	2,459,729	2,503,357
Dividends	1,500,000	1,500,000	1,358,865
Surplus	509,732	959,729	1,144,492
Previous surplus	8,774,252	7,814,523	7,014,023
Less adjustments	70,656	....	....
Total surplus	9,213,328	8,774,252	8,159,415

*Equal to 8.03% earned on $25,000,000 capital stock outstanding, compared with 9.8% earned in 1913.

The balance sheet of Dec. 31, 1914, shows total assets $74,782,841, of which coal lands, mining and railroad equipment owned is valued at $53,915,030. Stock and supplies on hand amount to $1,607,862, bills and accounts receivable $5,955,452 and cash on hand $1,555,227. In its liabilities the company includes $25,000,000 outstanding capital stock and $6,190,500 stock authorized but not issued, and bonded indebtedness is $29,916,000. Bills payable amount to $2,782,633.

In 1914 the total tonnage of bituminous coal mined by the company and its subsidiaries was 9,562,515 gross tons, a decrease of 397,296 from 1913. Coke manufactured last year amounted to 58,202 tons, a decrease of 17,848 from 1913. Coal mined by lessees in 1914 totaled 479,971 gross tons, 271 less than in the previous year.—"Philadelphia News Bureau."

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

✚Indicates contracts regarding which official information has been received.

Recast

In the following table we give a list of all old contracts coming up for consideration during the ensuing week. The table gives our contract number, the name of the purchaser, city, tonnage and page on which the detail notice appeared.

No.	Purchaser	City	State	Tonnage	Page
944	Brighton Foundry Co.	Chicago	Ill.		40
945	Butler Bros.	Chicago	Ill.	2500b	40
945	Butler Bros.	Chicago	Ill.	2500a	40
946	Artesian Stone & Lime Wks	Chicago	Ill.		40
948	Co-operative Ent. Glass Co.	No. Vernon	Ind.	500b	40
949	The Acme Malting Co.	Chicago	Ill.	2 (cars) [1]	40
952	Fairport Municipal Com.	Fairport	N. Y.	2000b	40
953	Board of Education	Lynn	Mass.	2057b	40
954	Light & Water Dept.	Port Gibson	Miss.	1600b	40
955	Manistee Flour Mill Co.	Manistee	Mich.		40
956	Abbott Lt. & Power Co.	Petersburg	Ill.	3200b	41
958	Electric Works	Washington	Ind.	5000b	41
960	Harriman Water & L. Dept.	Harriman	Tenn.	2160b	41
973	Board of Education	St. Cloud	Minn.	300b	41
990	General Hospital	Kansas City	Mo.	100b	76
998	Water Works Dept.	Kansas City	Kan.	20,000b	77
1003	Wesley Hospital	Kansas City	Mo.	150b	77
1005	Board of Education	Cleveland	Ohio	2800a	77
1005	Board of Education	Cleveland	Ohio	36,000b	77
1006	Proctor & Gamble Mfg. Co.	Kansas City	Kan.	200b	77
1018	Kelley Milling Co.	Kansas City	Mo.	20 (tons) [2]	77
1021	Western Sash & Door Co.	Kansas City	Mo.	20 (cars)	77
1030	Spalding's Col.	Kansas City	Mo.	10 (cars) [3]	115
1032	Board of Education	Cleveland	Ohio	300a	115
1032	Board of Education	Cleveland	Ohio	38,500b	115
1050	Baker & Lockwood	Kansas City	Mo.	6 (cars)	116
1065	Board of Education	Kansas City	Kan.	2000b	116
1080	Morris & Co.	Kansas City	Mo.	750b [1]	117
1084	Board of Education	New Lexington	Ohio		117
1086	Deputy T. Jennings	Clinton	Mo.		117
1093	City Government	Franklin	Pa.	2400b	117
1096	Montgomery Ward & Co.	Kansas City	Mo.	6000b	157
1098	Board of Education	Huntingdon	Penn.	250b	157
1103	Michigan Farm Colony	Wahjamega	Mich.	60 (tons) [3]	157
1103	Michigan Farm Colony	Wahjamega	Mich.	100a	157
1104	Borough School Bd.	Springdale	W. Va.	4000	157
1116	Board of Education	Windsor	Mo.		158
1124	Board of Education	Ipswich	Mass.	100a	158
1124	Board of Education	Ipswich	Mass.	200b	158

[1] Per week. [2] Per day. [3] Per month. a Indicates anthracite coal b Indicates bituminous.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

✚**No. 801—Henderson, Ky.**—Two bids have been received on this contract (Vol. 7, pp. 1005, 1126), which provides for furnishing the Municipal Electric Light Plant with about 9000 tons of coal. The Peoples Coal Co., which operates in this immediate vicinity, has bid $1 per ton, and the St. Bernard Mining Co. 85c. A severe fight is being made to award the business to the Peoples company because of the fact that a great many of the miners working for that concern are residents of Henderson. The question is now in the hands of a committee which will probably act on it shortly. Address Supt. L. P. Hite, Municipal Light Station, Henderson, Ky.

✚**No. 848—Chicago, Ill.**—While it was expected that awards on this contract (Vol. 7, p. 1049), which provides for furnishing the local Board of Education with its fuel requirements during the ensuing year, would be made on July 2, the matter was deferred until July 7, and on that date was again deferred for an additional two weeks. No information can be obtained as to when the contract will finally be placed. Address Secy. L. E. Larson, Bd. of Edu., Tribune Bldg., Chicago, Ill.

No. 894—Richmond, Ind.—All the bids submitted on this contract (Vol. 7, p. 1086), which provides for furnishing the Board of Public Works with approximately 10,000 tons of nut and slack coal, have been rejected. Requests for new bids will be readvertised. Address Pres. Alfred Davis, Bd. of Pub. Safety, Richmond, Ind.

✚**No. 905—Logan, Ohio**—Bids have been received on this contract (Vol. 7, p. 1126), which provides for furnishing the local Board of Education with approximately 400 tons of coal, as follows: Charles Vories, 1¼-in., screened, $2; Hocking Valley Brick Co., 2-in., screened, $2.15; Barthelson & Son, 1¼-in., screened, $2.10; Richard Barthelson, 1¼-in., screened, $2.12½; Helm Clay Products Co., 1¼-in., screened, $2.05. Address Clk. Herbert R. Harrington, Logan School Dist., Logan, Ohio.

1010—Kansas City, Mo.—This contract (p. 77), which provides for furnishing the fuel requirements of the Kansas City Soap Co., will be let about Aug. 15 if satisfactory propositions are received, and otherwise the company will continue to buy in the open market. Address H. L. Fetters, Kansas City Soap Co., Shawnee and Railroad St., Kansas City, Kan.

1066—Pella, Iowa—Bids on this contract will be received until 6 p.m., Aug. 3, instead of July 20, as previously announced (p. 116). Lump, mine-run and steam coal are required and quotations should include cost of delivery in the bin at the light plant. Address City Clk. A. C. Kuyper, Pella, Iowa.

1088—New York, N. Y.—Bids have been received on this contract (p. 117), which provides for furnishing the Department of Bridges with about 250 tons of both No. 1 buckwheat and mine-run coal as follows:

	Buckwheat No. 1	Mine-Run
Burns Bros.	$3.25	$3.30
Gavin Rowe	3.48	3.48
John F. Schmadeke, Inc.	3.51	3.61

Address Bridge Comr. F. J. H. Kracke, Municipal Bldg., New York City.

New Business

✚**1131—Wellington, Ohio**—The Municipal Electric Light Plant at this place usually contracts some time in the fall for their annual requirements of coal aggregating approximately 900 tons of three-quarter lump. The customary price is about $2.35 per ton, and the business is done on a competitive basis. Address Supt. C. E. Gadfield, Municipal Elec. Lt. Plant, Wellington, Ohio.

✚**1132—Bloomington, Ill.**—The Board of Education at this place received sealed bids until 4 p.m., July 26, for furnishing approximately 1000 tons of bituminous lump coal. The storage capacity of the school buildings is to be filled prior to Sept. 1, and payments will be made Jan. 1 and July 1. The successful bidder will be required to furnish a satisfactory bond for $6000. Address Chn. R. E. Williams, Bd. of Edu., 602 Peoples Bank Bldg., Bloomington, Ill.

✚**1133—Springdale, Penn.**—The Board of Education will receive bids until 6 p.m., Aug. 3, for furnishing approximately 4000 bu. of mine-run coal to be delivered in the basement of the school buildings. Address W. A. Clowes, Jr., Boro. of School Bd., Springdale, Penn.

✚**1134—Butte, Mont.**—The Board of Education at this place usually receives bids about Sept. 1 for furnishing the coal supply amounting to approximately 3000 tons per year. Lignite coal is used principally and the usual price is about $4.50 per ton. Address District Clerk, Box 1413, Butte, Mont.

1135—Louisville, Ky.—The annual contract of the Louisville Provision Co. for their coal supply involving about 2400 tons of nut and slack coal expires on Sept. 1. The company requires delivery by wagon. Address J. M. Emmart, Louisville Provision Co., 916 East Market St., Louisville, Ky.

1136—Bloomington, Ind.—The trustees of Indiana University are requesting bids for furnishing the School of Medicine and the Robert W. Long Hospital with coal during the ensuing year. Specifications are on file at both the medical school and the University. Address John W. Cravens, Bd of Trustees, Bloomington, Ind.

✚**1137—Jefferson City, Mo.**—Sealed proposals will be received until Aug. 2 for furnishing the Missouri State Penitentiary with about 25,000 tons of coal during the year beginning Nov. 1. No. 1 Illinois washed egg coal and 6-in. Missouri and Illinois lump are required. Bids should be made f.o.b. Penitentiary switch. A bond for $10,000 will be required for the faithful performance of the contract, and all bids must be accompanied by a certified check for $1000. Address Warden D. C. McClung, Missouri State Penitentiary, Jefferson City, Mo.

+1138—Cuyahoga Falls, Ohio—Sealed proposals will be received until Aug. 5 for furnishing the local schools with either Pittsburgh, Youghiogheny, or Bergholtz three-quarter lump coal. Bids may be submitted on either one or all three of the buildings involved. Address Secy. H. N. Rook, Cuyahoga Falls School Bd., Cuyahoga Falls, Ohio.

+1139—Marion, Ohio—The Board of Education received sealed bids until noon, July 26, for furnishing about 480 tons of coal required at the different school buildings during the ensuing year. Bids were requested on Hocking, Sunday Creek or Pomeroy domestic lump, or coal of equal quality. Address Clk. Jeanette L. Hutchinson, Bd. of Edu., Marion, Ohio.

+1140—Beaver Falls, Penn.—The School Board at this place will receive bids until 5 p.m., Aug. 1, for furnishing and delivering 1600 bu. of three-quarter inch Pittsburgh forked coal to be rescreened at the car. Address Secy. H. J. Shaefer, Beaver Falls Bd. of School Dir., Beaver Falls, Penn.

1141—Princeton, Ill.—Bids will be received until Aug. 2 for supplying the Court House and Jail with coal during the ensuing year. Address County Clk. James Fletcher, Bd. of Supervisors, Princeton, Ill.

+1142—Sprague, Wash.—The Board of Education will receive bids until Aug. 20 for furnishing 75 tons of washed steam coal and 16 tons of lump coal. Address Clk. J. F. Hall, School Dist. No. 6, Sprague, Wash.

+1143—Spokane, Wash.—The Board of Education at this place usually contracts for their annual fuel requirements some time in August. The call for bids is advertised, and the customary price is about $5 per ton. British Columbia mine-run coal is used and about 1500 tons is required. Address Board of Directors, School Board, Spokane, Wash.

+1144—Nelsonville, Ohio—The Board of Education at this place will receive bids until noon, Aug. 26, for furnishing the mine-run coal required at the several school buildings during the ensuing year. Address Clk. E. B. Beard, City Bd. of Edu., Nelsonville, Ohio.

+1145—Galesburg, Ill.—The City Government will receive sealed bids until 4 p.m. for furnishing its fuel requirements during the period ending Apr. 30, 1916. Bids for the Poor Departments and other city buildings, excepting the Water and Electric Light Plant, are to include cost of delivery, and bids for the Water and Electric Light Plant are to include delivery to the shed at the water-works. All bidders must furnish a sample lot of the coal they propose supplying sufficient to run the plant 24 hr. A certified check for $100 must accompanying each bid, and the successful bidder will be required to furnish a bond for $2500. Address City Clk. William L. Boutelle, Galesburg, Ill.

+1146—Wichita, Kan.—The Board of Education at this lace usually contracts for their annual fuel requirements some time in August. About 2500 tons of bituminous and semi-bituminous coal is required. Bids on the current contract were as follows, Weir City Coal being bid on exclusively: Mill, $3; lump, $4.40; nut, $3.60; slack, $2.75 to $3. Address Board of Education, City Hall, Wichita, Kan.

1147—Philadelphia, Penn.—The Martin & W. H. Nixon Paper Co. at this place usually contract for its annual fuel requirements, involving about 1500 tons of mine-run bituminous, on Aug. 1. The company has a storage capacity for 1000 tons, and deliveries are by rail at the rate of approximately 50 tons per day. Address Pur. Agt. J. O. Hayes, Martin & W. H. Nixon Paper Co., Manayunk, Philadelphia, Penn.

+1148—Tingley, Iowa—The school board at this place received bids until July 23 for furnishing 1000 bu. of Illinois and Centerville coal to be delivered in the bins. Address Secy. H. W. Edwards, Tingley, Iowa.

+1149—Broken Bow, Neb.—Bids will be received until noon, Aug. 10, for furnishing Custer County with its coal requirements during the ensuing year. All bids must be accompanied by a certified check for $25 and quotations are required on nut coal, f.o.b. sidetrack at Broken Bow. Address County Clk. R. E. Waters, Broken Bow, Neb.

+1150—Muscatine, Iowa—Sealed bids will be received until 1:30 p.m., Aug. 2, for furnishing approximately 400 tons of bituminous coal for use in the County Institutions. Bids should be on four- and six-inch lump coal, f.o.b. cars at Muscatine. About 200 tons must be delivered during August. Address County Audr. H. C. Shoemaker, Muscatine, Iowa.

+1151—New York, N. Y.—Bids will be received until 11 a.m., Monday, Aug. 2, for furnishing and delivering 23,700 gross tons of anthracite and semi-bituminous coal for the Board of Education. Blank forms and further information may be obtained on application. Address Supt. of School Supplies Patrick Jones, Bd. of Edu., 59th St. and Park Ave., New York, N. Y.

+1152—Minot, N. D.—The School Board of Harmony School District, No. 151, will receive sealed bids till 2 p.m., Aug. 14, for furnishing the coal requirements at School No. 2 of that district during the ensuing year. Address Clk. Cole Larson, School Bd. Harmony School District, Minot, S. D.

+1153—New Philadelphia, Ohio—The Board of Education will receive sealed bids until noon, Aug. 5, for furnishing the coal required at the several school buildings during the ensuing school year. Bids are requested on screened forked coal. Address Clk. A. A. Stermer, Bd. of Edu., New Philadelphia, Ohio.

+1154—Kingman, Kan.—The Board of Education will receive sealed bids until Aug. 2 for furnishing 200 tons of Cherokee nut, one-half the deliveries to be made during August, and the balance during the Christmas vacation. Address Clk. Beulah Russell, Bd. of Edu., Kingman, Kan.

+1155—Harvey, N. D.—The Board of Education will receive sealed bids until 8 p.m., Aug. 2, for furnishing 100 tons of the best grade Hocking Valley coal. Bids are to include cost of delivery in the boiler room at the High School. Address Clk. P. J. Reimer, Bd. of Edu., Harvey, N. D.

1156—Marcus Hook, Penn.—The Pure Oil Co. at this place will receive bids until Aug. 1, for furnishing from 7500 to 10,000 tons of bituminous coal. Address Purchasing Agent, Pure Oil Co., Lafayette Bldg., Philadelphia, Penn.

+1157—Brookings, S. D.—The City Government will receive sealed bids until 8 p.m., Aug. 2, for furnishing the annual coal supply during the ensuing year. Quotations should be made f.o.b. cars at Brookings and deliveries are to be made in box cars. Bids are also requested for hauling the coal. Address County Audr. G. H. Stoddard, Brookings, S. D.

+1158—St. Clairsville, Ohio—Sealed proposals will be received until 1 p.m., Aug. 16, for furnishing the coal requirements of Belmont County Court House and Jail during the ensuing year. A satisfactory bond or certified check for 25% of the amount bid must accompany all proposals. Address County Audr., Emerson Campbell, St. Clairsville, Ohio.

+1159—Plains, Penn.—Sealed proposals will be received by the Board of Education until 7 p.m., Aug. 9, for furnishing the coal required at the local school buildings during the ensuing year. Address Secy., James J. Judge, Bd. of Edu., 5 S. Main St., Plains, Penn.

1160—Kansas City, Mo.—The Park View Hotel at this place will be in the market about Sept. 1 for approximately 200 tons of semianthracite, nut and slack coal. Address Manager, Park View Hotel, 10th and Paseo St., Kansas City, Mo.

+1161—Colorado Springs, Colo.—The Board of Education of this place will contract about Sept. 1 for its annual requirements of coal, amounting to approximately 3000 tons of mine-run lignite. The current contract is being filled at about $2.50 per ton. The call for bids is advertised and deliveries are to be made as required. Address Board of Education, D. E. Graff Bldg., Colorado Springs, Colo.

1162—Delphi, Ind. — Sealed proposals will be received until Aug. 3, for furnishing the County Poor Asylum, Jail and Court House with approximately 250 tons of anthracite and Hocking Valley or some other grade of soft coal. The coal is to be delivered as required. Address Aud. M. G. Huan, Carroll County, Delphi, Ind.

1163—Carthage, Mo.—The Board of Education will receive bids until Aug. 3, for furnishing 250 tons of Nevius coal to be delivered in the bins of the various buildings. Address Chn. W. F. Maring, Supply Com. Bd. of Edu. Carthage, Mo.

1164—Fargo, N. D.—The Board of Education will receive bids until 8 p.m., Aug. 4, for furnishing 2000 tons of screened lignite coal to be delivered at the different school buildings as required, during the period ending June 1, 1916. Bids are also requested on 200 tons of Pocahontas mine-run. All bids must be accompanied by a certified check for $100. Address Secy. E. G. Guthrie, Bd. of Edu. High School Bldg., Fargo, N. D.

1165—Greensburg, Penn. — The Board of Education of Greensburg will receive bids until Aug. 4, for furnishing and delivering No. 1 screened coal and good stock coke, to the different buildings as required. Address Secy. Harry E. Blank, Bd. of Edu., Greensburg, Penn.

1166—Emporia, Kan.—The Board of Education will receive bids until Aug. 2, for furnishing its coal requirements during the ensuing year. Address Clk. M. N. Champe, Bd. of Edu., Emporia, Kan.

1167—Guthrie Center, Iowa—Bids will be received until noon, Aug. 3, for furnishing the Guthrie County Court House with coal during the ensuing year. Address Chn. W. H. Neal, Bd. of Supervisors, Guthrie County, Guthrie Center, Iowa.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

No. 363—Toledo, Ohio—This contract (Vol. 7 pp. 566, 955), which provides for furnishing the local Water Works with approximately 6000 tons of coal for use at the Broadway Pumping Station, has been awarded to the **M. A. Hanna Co.** at $1.90 per ton. Address Supt. P. R. Cook, Water Works Dept. Toledo, Ohio.

+No. 726—New York, N. Y.—This contract (pp. 76, 157) has been awarded as follows: **William Farrell & Son,** Item No. 1, $6819.50; **Bacon Coal Co.,** Item No. 2, $3510; **Commercial Coal Co.,** Item No. 3, $3708. These were the lowest bids on this business. Address Fire Comr. Robert Adamson, Municipal Bldg., New York City.

+No. 810—Oelwein, Iowa—This contract (Vol. 7, p. 1006), which provides for furnishing the City Government with approximately 900 tons of coal, has been awarded to the **Norwood White Coal Co.** on steam coal at $2.03 per ton. Address City Clk. E. H. Burlingham, Oelwein, Iowa.

+No. 824—Detroit, Mich.—This contract (Vol. 7, p. 1049), which provides for furnishing the local Board of Health with coal, has been awarded to the **United Fuel & Supply Co., William E. Besancon** and **Daniel Sullivan.** About 2000 tons of bituminous mine-run and 500 tons of anthracite will be required. Address Secy. John F. McKinley, Bd. of Health, 223 St. Antoine St., Detroit, Mich.

No. 929—New Orleans, La.—The price at which this contract was awarded (Vol. 7, p. 1127, Vol. 8, p. 42) was $2.65 per short ton. The contract calls for Pratt washed nut and slack coal, with a guarantee of 14,500 B.t.u., not to exceed 6% ash or 3% moisture. The contract covers the year from July 1. It was awarded to the **Tennessee Coal, Iron & Land Co.** through its agent, Frank S. Walsh, of New Orleans. Address Fred W. Matthews, Charity Hospital, New Orleans.

Contract Notes

St. Louis—Bids for supplying coal to the City of St. Louis for all city institutions, departments and offices except the waterworks for the twelve months ending July 31, 1916, were opened July 9, at noon. The bids were as follows, the probable successful bid being noted in **full face** type:

	Lump Coal											Nut		Washed						Coke	
	Four Courts and Courthouse	Industrial School	Engine Houses	Parks	Infirmary	All other City offices	Workhouse (car)	Asphalt Plant (car)	Harbor Boat	Harbor Boat (wagon)	Robert Koch Hospital (car.)	Sanatarium (car)	Sanitarium (wagon)	City Hospital	City Hall	City Hosp. Inf. & San.[1]	All other offices[2]	Fire Dept.[3]	All City offices[4]	Fire Dept.	All other
Boehmer Coal Co.	$1.88	**$1.86**	**$1.98**	**$2.03**	$1.98	**$1.98**	**$1.49**	**$1.49**			**$1.74**	**$1.31½**	$1.62½	$1.49	$1.79	**$2.54**	$5.14	$5.49	$7.89	**$4.82**	$4.89
Polar Wave Ice & Fuel Co.	1.86	1.92	2.00	2.33	....	2.00	1.54	1.54			1.86	1.38½	1.58½	1.57	1.94	2.62	**5.00**	**5.45**	7.85	4.84	4.84
Bald Eagle Mining Co.	**1.81**	1.91	....	....	**1.96**	....	1.52	1.52			1.78	1.34	**1.59**	1.67	1.91	2.60	....	....	....	....	....
Southern Coal, Coke & Mining Co.	....	....	....	....	....	....	1.67½	1.67½	**$1.94¾**	$2.30	1.89	....	....	....	....	....	....	....	....	....	....
Inland Valley Coal Co.	1.98	2.10	2.10	2.50	....	2.10	1.67	1.67	....	2.10	1.95	1.42½	1.77½	....	....	2.75	5.25	5.75	7.85	5.10	5.50
Madison Coal Corporation	....	....	....	....	....	....	....	....	2.25	....	....	....	....	....	....	....	....	....	....	....	....
Stephan Coal Co.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5.60	....	....	....	....
Donk Bros.	1.89½	....	....	....	....	....	1.60½	....	....	**1.98**	1.98½	....	....	1.46	1.82	....	....	....	....	....	....
McConnell & Pilcher	1.82½	....	....	....	....	....	....	....	....	....	....	....	....	**1.43½**	1.69½	....	....	....	....	....	....
Last year prices	1.77	1.87	1.99	2.00	2.00	2.00	1.48¾	1.48¾	1.98	2.00	1.90	1.35	1.60	1.41	1.89 1 42	2.57	5.04	5.23	7.90	4.84	5.00

[1] Carterville egg. [2] Smokeless. [3] Youghiougheny. [4] Anthracite.

Because the bids for delivering lump coal to the harbor boat by wagon were higher than that of the Boehmer Coal Co. for delivering lump to all other city offices, the contract under the harbor boat classification was awarded to the Boehmer Co. under the other classification. The Stephan Coal Co. bid $5 on Pennsylvania smokeless but as the specifications called for West Virginia smokeless the contract will go to the Polar Wave Co. on its bid of $5. Comparison with last year's figures shows that the prices are, on the whole, a little lower. The quantities estimated to be required during the year are as follows: Sanitarium Pumping Station, 20,000 tons nut; City Hospital, 12,000 tons washed; City Hall, 10,000 tons washed; Robert Koch Hospital, 3000 tons lump; Work House, 3400 tons lump; Industrial School, 2600 tons lump; Infirmary, 1500 tons lump; Harbor Boat and other offices, 2500 tons lump; coke, 3500 tons; anthracite coal, 250 tons; Youghiogheny coal, 250 tons; Carterville egg, 600 tons; smokeless coal, 600 tons. Address Supply Comr. J. B. Thomas, City Hall, St. Louis, Mo.

+Louisville, Ky.—Contract of the American Creosoting Co. for 3000 tons of screenings per annum has been let to the **Consolidated Indiana Coal Co.** until Apr. 1, 1916.

Corinna, Me.—Burrill & Clark at this place purchase about 600 tons of steam coal per annum as required. They have a storage capacity of 200 tons and deliveries are made by water and rail. Address E. R. Clark, Corinna, Me.

+LeSueur, Minn.—The city contract at this place has been awarded to the **St. John Grain Co.,** on "Orient" egg coal to be shipped from Franklin County, Ill. The price was $1.35 per ton f.o.b. cars at mines.

Fairview, Okla.—The Local Electric Light Dept., consumes approximately 1680 tons of mine-run coal per annum which usually costs about $3.68 per ton. The business is let on competitive bids. Address Supt. P. H. Wimpey, Fairview, Okla.

Putnam, Conn.—The Putnam Light & Power Co., at this place buys its coal under a 100,000-ton contract made by the Saylesville Bleacheries, at Saylesville, R. I. The business is let on competitive bids, and New River coal is used. Address Gen. Mgr. R. Y. Thurston, Putnam Light & Power Co., Putnam, Conn.

Rock Rapids, Iowa—The Municipal Electric Light Plant at this place consumes about 1400 tons of coal per annum which is bought entirely in the open market. Iowa steam coal is used principally, and the cost is about $3.25 per ton. Address Supt. W. F. Gingrich, Municipal Electric Light Plant, Rock Rapids, Iowa.

Carrollton, Ky.—The Light Department at this place consumes about 2200 tons of bituminous nut coal which usually costs about $2.75 per ton. The business is not done on competitive bids. Address R. L. Bartlett, Carrollton, Ky.

Bayfield, Wis.—The Bayfield Light, Power & Water Plant, at this place consumes about 400 tons of Pittsburgh screenings per annum, the coal being required only during three months. The business is not done on a competitive basis and the approximate cost is $2.30 per ton. Address Supt. F. M. Herrick, Bayfield Light, Power & Water Plant, Bayfield, Wis.

Watkins, N. Y.—The Watkins Municipal Light & Water Plant, consumes about 1200 tons of bituminous coal per annum which is bought at approximately $2.30 per ton. No contracts are made and the business is done on a competitive basis. Address Supt. Charles E. Dennis, Watkins Municipal Light & Water Plant, Watkins, N. Y.

Waukon, Iowa—The Interstate Power Co. at this place consumes about 700 tons of washed screenings per annum, which is usually bought at approximately $3.40 per ton. The coal is not bought on competitive bids. Address E. B. Gibbs, Interstate Power Co., Waukon, Iowa.

Erie, Penn.—Bids for furnishing the local Fire Department with coal during the ensuing year were opened on July 1, as follows: Burnwell Coal Co., $5.15, anthracite f.o.b., and $5.90 in bin; G. B. Gebhardt, $5.77½ for anthracite f.o.b. and $2.75 for Pittsburgh coal; Erie Coal Co., $5.15, anthracite f.o.b., and $5.65 in bin; Wittman-Pfeffer Co., $5.15, anthracite f.o.b., $5:65 in bin, and $3.75 for Pittsburgh coal; Momeyer Coal Co., $5.15, anthracite f.o.b., and $5.65 in bin; Guelcher Bros., $5.15, anthracite f.o.b., and $5.90 in bin; Mutual Coal Co., $5.25, anthracite f.o.b., and $5.70 in bin; W. L. Scott Coal Co., $6, anthracite f.o.b., and $6.35 in bin; Saltsman Coal & Supply Co. and the J. F. Siegel Coal Co. each bid $5.15 per ton, anthracite f.o.b.

+Portland, Ind.—The contract for the coal needed to operate the city light and power plant for the coming year will be let to the **Southern Coal & Coke Co.,** of Knoxville, Tenn. The coal will be purchased at 90c. per ton the freight rate being $1.55, making the total cost of $2.45.

COAL AGE

Vol. 8 NEW YORK, AUGUST 7, 1915 No. 6.

What is a Mining Engineer?

A MINING ENGINEER *is an individual who cherishes hopes that some day—the day when he will be able to call himself a superintendent or consulting engineer—he may be able to earn as much money per month as does the average coal digger or other indispensable personages connected with the mining industry.*

OCCASIONALLY a mining engineer manages to get control of a modest bank account by capitalizing some of the information he has gathered from various sources at various times as to values of undeveloped mineral tracts. On such occasions, however, some employer or past employer is certain to come forward to insist that the engineer betrayed a trust in using information that he was supposed to acquire for the benefit of anyone who might wish to use it except himself.

If an executive officer absorbs general information given to him by his engineer and then passes it on to a son or other relative having no connection with the company and allows him to make the most of it, his directors may censure him on the ground that he is giving too much attention to outside business, but the director hasn't yet been born who would class such procedure as a betrayal of trust.

And the reason is not far to seek—directors do not expect employees to mortgage themselves body and soul when they seek employment. Truth is, directors are not fond of defining too closely the rights of individuals in the employ of others, because directors realize that they, too, are only individuals in the eyes of the law.

Mining engineers are considered the logical referees in all cases where disputes arise between land owners and leasing companies, and their decisions are seldom questioned even though one of the parties to the dispute is the employer of the engineer.

In times of labor troubles mining engineers are pressed into service as mine guards, and in slack times, when they begin to find enough idle time to brush up on the theory of their profession, they are permitted to assist the clerical forces—mining engineers are so good at figures, you see.

But in times of extreme prosperity, when dividends begin to pile up and stock values change daily, many coal companies conveniently forget that the mining engineer might be willing to share in the general improvement and do it as uncomplainingly as he shouldered the gun for guard duty.

Possibly he might be willing to use part of the easy money that came his way to prepare one of his sons to follow in his footsteps, even though up to the present writing a mining engineer, son of a mining engineer, is almost a curiosity.

Ideas and Suggestions

Day-Labor Cost of Operating Coal Mines

By George S. Brackett*

The price paid the miners and loaders for placing the coal on the mine car at the working face is the largest single item in the costs of operating bituminous coal mines. The next largest is the day-labor expense. The former is practically fixed for each region and does not vary. Every ton of coal produced costs just so much, and regardless of the management it remains the same. It is not subject to adjustment by the ability of the superintendent or foreman. It is entirely eliminated from any discussion as to methods of reducing the cost of production, being an item beyond the management's power to change. The royalty charges are also fixed and not amenable to adjustment. The supply account is much the same from month to month, as the necessary material must be purchased as needed. Extra expenditures for material may be postponed temporarily, but in the long run from year to year little change can be made in the supplies used at the mine.

The superintendent's ability to handle and operate a mine successfully hinges principally on the one item—the day-labor cost of operation. This he can reduce or raise at will within certain limits. He can improve the underground conditions while better market prices rule or reduce the amount of labor done during dull times. The success or failure of the mine depends largely on this labor cost. It is subject to more variation than any other cost item on account of its being dependent almost entirely upon the individual ability of the management, and this quality has as many variations as there are individuals.

The question of what this cost should be is much disputed, and many estimates are made based on any one or group of mines. Each superintendent knows what he is doing himself, but there is more or less reticence in exchanging figures with neighboring mines.

Establishing an Average

An average value for this cost of labor is important, and the impracticability of obtaining average figures over large sections for periods of considerable time has led to much misunderstanding and criticism of the local management. The average cost is not what, in the opinion of a few men, the work should be done for, nor is it a few months' test run. It is a figure covering a long period of time, allowing for considerable mining difficulties and embodying some allowance for the labor necessary to the general maintenance and repairs of the mine and plant. It should include a wide variety of conditions, both favorable and adverse. Granting that this average can be established, the benefit to the operators is evident.

The accompanying diagram is compiled from published figures of 454 mines in Pennsylvania and West Virginia. The number of mines entering into the average is so great that any inaccuracy that may occur in the report from any one mine would be inappreciable in the result. Any temporary conditions such as an unusually high or low cost simply influence the result in making the figures represent average conditions through long-time operation. Also mines were selected which worked over 230 days in the year, so that the estimate may be taken as of mines producing their capacity and maintaining their equipment and mine conditions.

The foundation of the diagram is the mean force of day employees requisite at the mine for a period of one year; and the average daily shipments are based on the annual production. Some mines included in the average may be going through that period of reconstruction and betterment that is advisable periodically. Others may be using every means of economy. In fact, the figures may be taken as being very fair operating expenses covering a considerable period of time and variable conditions. They do not represent the cheapest mine nor the most expensive. Certain mines must necessarily call for higher labor costs than others, but these conditions are known, and any such allowance made to fit the individual case. Although the figures include an average amount of rock work they do not represent exceptions; and they represent the average haul over the large number of mines.

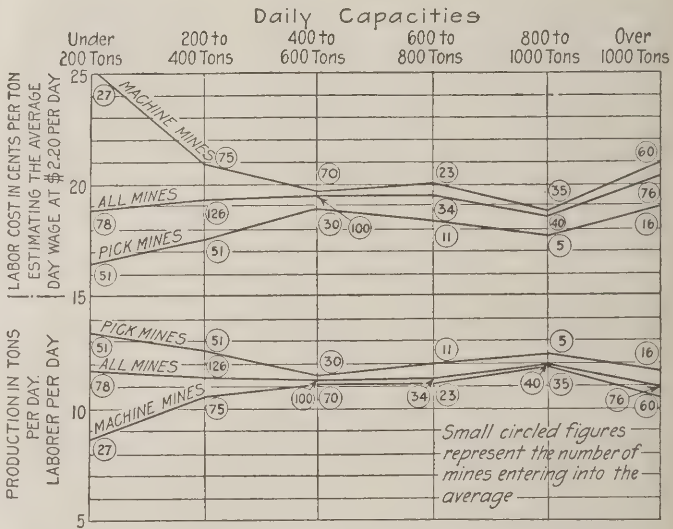

DIAGRAM SHOWING LABOR COST OF PENNSYLVANIA AND WEST VIRGINIA COAL MINES

Basis of the Calculation

The basis of the diagram is the number of tons output per day-employee or day-laborer per working day. It does not take into consideration any extra-time track men, drivers and others who may be working while the mine is idle. It is customary for some day-men to work in idle time on something that may be then more easily done. Although this is a small percentage of the regular day-labor expenses it is something, and it would accordingly increase the cost given in the diagram. In explanation of the chart, it may be added that the force of miners or loaders necessary to produce the tonnage is not figured in the day-labor cost, the coal being loaded on the mine car at the working face by the requisite number of miners. The coal is hauled by drivers, track laid and repaired by trackmen, doors opened by trappers; these, with the motormen, brakemen, dumpers, trimmers, car shifters and all other day-labor necessary to move this tonnage from the working face to the loaded railroad car, are represented on the diagram in the "Production in Tons per Day-Laborer per Day" and "Labor Cost in Cents per Ton, Estimating the Average Day Wage at $2.20 per Day."

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*Flemington, W. Va.

Calculating an Average Cost per Ton

Firebosses are included when employed, also shopmen and carpenters; but not the superintendent or mine foreman or the mine-office force. It is simply the bare day-labor cost. The cost per ton is derived from the tons per day-man per day. The greater the tonnage the less the cost. The averages given in the lower half of the diagram show that the production per day-man runs from 8.7 tons for the low-capacity machine mines up to 13.4 tons for the low-capacity pick mines. These are the extremes in the averages.

To reduce these figures to cents per ton, an average day wage throughout the industry must be assumed. This average varies in different regions, and the upper half of the diagram may have to be readjusted to a small extent to fit the prevailing wage scale. Curiously the average production per day-man per day remains practically unchanged throughout many thicknesses and characters of coal—for the central Pennsylvania thin steam coals, western Pennsylvania thick gas and coking coals, thick steam coals of southern West Virginia and the thick and thin gas coals of central and northern West Virginia.

If any variation from this is to be noted it is in a little greater efficiency in the regions where the higher wage rates are in effect. For this reason a moderate average day rate was established; namely, $2.20 per day—little higher than the existing average in the low-rate regions and lower than those existing in western Pennsylvania. Considering this, I doubt very much if the costs per ton shown on the diagram can be changed materially for a wide range of mining conditions and wage rates throughout the bituminous coal regions.

Great Variation in Production

There is an almost inexplicable variation in the production per day-laborer per day when individual mines are considered, extreme cases running from 20 tons down to 5 tons. This indicates some confusion in this mine-labor item and the lack of any well-founded base for what this cost really should be.

It will be noticed that 51 pick mines with a capacity of less than 200 tons daily were operated with a labor cost of 16.6c. per ton—the cheapest group of mines. The interpretation is that these mines are so small and simple in their organization and so few men are employed that it is almost impossible to blunder in their operation. The only explanation advanced as to the rise in costs in pick mines up to 400 or 600 tons capacity is that these mines outgrow the crude management of the smaller mines up to that point; and from there up to the 1000-ton mark the more experienced management is in evidence.

Small capacity machine mines are a failure, as the cost of the power house and appliances are prohibitive for such small tonnages, and the operating costs of these mines decline generally up to 1000-ton capacity. There is little variation in this decline, as their equipment calls for experienced men in the start.

The reason for the increase in cost of all mines over 1000-ton capacity can only be speculation, but the evidence points to their being too large for almost any human being to exercise the proper supervision. Large mines are almost always equipped with the most modern labor-saving appliances, and their labor costs should be correspondingly less.

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Temporary Center Post

The majority of accidents in the bituminous mines of Pennsylvania occur from falls of roof at the working faces. This fact has led to devising means whereby the danger at these places might be reduced. About a year ago the state inspectors having charge of the mines in the coke region decided after much investigation, to enforce the placing of a temporary center post at the working face of all places, regardless of whether the apparent condition of the sustaining roof appeared to require it or not.

Instructions to this effect were sent to all the operators and met with but little opposition. The inspectors did not claim that the center post was necessary at every face and admitted that in many places it appeared ridiculous to require it; but they did maintain, and rightly, that there should be no exception. It is well known that where the roof is naturally bad it is impossible always to judge just how safe the roof really is. Places that appear almost absolutely safe are sometimes the most dangerous.

It was to guard against these unseen as well as the known dangers that made the placing of the center post imperative in *all* places, in the judgment of these inspectors.

By this method a post is set in the center of the place within a foot or two of the face, by the miner before he begins to dig or load coal. As he advances in his work during the day, he will set another post if the face advances more than 3 ft. from the first post. In this manner the workman is always protected from falls of roof. The cost is small, as the post, being only temporary, can be set in a few minutes by the miner, and may be used time after time.

At one group of mines where the roof is very treacherous it is known that several accidents have been prevented in the last year through this precaution, and there were probably many more of which we do not know.

One of the inspectors is authority for the statement that the setting of a center post has reduced his accidents fully 40 per cent. All of the operators agree that this is one of the best orders put in force in late years, and this region will show a decrease in fatalities at the working faces in the next report.

Mining With a Conveyor System

By J. F. K. Brown*

SYNOPSIS—By installing 300-ft. conveyors and changing the general plan of operation of the mine, not only was mining rendered more safe, but the output was increased and the costs lowered.

The method of operation by conveyor herein described has been in use in a number of collieries belonging to a company working some comparatively thin measures in one of the coal fields in Scotland, and has proved its success and applicability through a period of at least 10 years. In some respects the method adopted was unusual in that while conveyors are in operation by themselves no coal-cutters are employed, undercutting being done by hand. Present-day practice always considers conveyor work an adjunct to machine mining; but here is a case of conveyor practice by itself. Another distinctive feature is that the opening and development of the mine for additional faces, as well as running the usual long-wall faces with the conveyor, are being done with a conveyor wall.

The coal seam on the average is 3 ft. 9 in. thick, but owing to the presence of stone bands is rather broken up, a correct section being as shown in the accompanying drawing. This means that after removing 31 in. of coal there remains to be disposed of somewhere about 14 in. of stone. The thick stone parting near the bottom of the coal is a yellow-white sandstone that breaks in flat squares, eminently suited for building the road pillars in longwall working.

The roof, which is an important factor in any mine's success, and particularly so in this case, consists of 10 to 12 in. of a strong "bind" (shale), above which is at least 5 ft. of a "mealy" soft "bleas"—also a local term for a shale—which possesses no adhesive powers of its own, and invariably flows into the workings wherever the shale immediately below it gives way.

Above this "mealy" shale is a thick bed of a heavy blocky sandstone. This naturally exerts a considerable downward pressure through the fine shale and on the "bind," which forms the only stiff parting in the roof, unless the whole 5 ft. of the "bleas" was taken down up to the sandstone above. To do this made too high a working, and proved too costly to practice; consequently efforts were always made to keep the "bind" unbroken.

In working under the old system, "dooks," or "deeps," were driven direct to the dip, the inclination being 8 deg. These "dooks" were driven in the solid coal, with pillars turned off every 150 ft. on the dip and 60 ft. on the level course. Every 300 ft. levels were broken off right and left, and a longwall face commenced two pillar lengths from the center deep, in a fan-shaped fashion, which as it opened out gradually edged uphill until its upper corner worked along the waste of the level above, and the face stretched from one level to another.

In driving the "deeps" three roads were allowed—one for haulage and intake air current while the two on either side where needed for return air. In order to operate the longwall faces at low cost, slants were driven uphill from the lowest level, and from the slant levels parallels to the main bottom level turned into the coal face, these being a distance of 40 ft. apart.

Every 200 ft. along the bottom level a fresh slant would be commenced, the object being to cut off the continually lengthening tramming levels and so provide a shorter haul to the level below, whence horse haulage conveyed the coal to the "deep."

As the working was only 45 in. high, it was necessary in all cases to "brush" the roof every night on each face 4 or 5 ft., and sometimes back-brushing 70 or 80 ft. behind the face could not be avoided in the levels. In some cases also it was necessary to brush slants owing to the rapid sinking of sandstone rock after the "bind" was once broken. Naturally, this brushing had to be carried up to the sandstone above the coal, and as much of the material thus brought down was fine and "crumbly," it had to be hoisted to the surface and disposed of there, all of which spelled loss in capital letters.

The building of the needed pack walls was done with the "bind" from the road heads, the stone from the seam itself, and partly from the sandstone taken down in back brushing. It was found by practice that this way of setting out working in semicircular fashion amounted practically to an invitation to the roof to fall in heavily in the center, where the lines of pressure converged.

By This Method the Roadhead Was Unsafe

In this method of operating the seam the "bind" was fractured in the regular course of working, and in such a manner as to create a series of parallel breaks running sometimes across the strike of the coal bed, or at any angle thereto. These breaks had a tendency to extend in advance of the coal, rendering the roadhead, unless special precautions were taken, an unsafe working place in comparison with the rest of the face.

Possibly owing to the dip and the nature of the overhead strata, there was also noticed a decided "creep" of the roof downhill, and in the course of a few weeks the rise side of each of the levels would start to press out the "mealy" shale, necessitating constant cleaning of the road. This also created trouble due to large holes or caves being left, which had afterward to be supported with fresh packing or timber. In short, troubles from the roof were constantly recurring, resulting in excessive costs.

Under these circumstances the officers in charge decided to experiment in the introduction of conveyors. With these in operation they expected to be better able to control the roof, not through the actual installation of this or any other machine, but through the regularity of working imposed by the fresh conditions introduced by the conveyor's advent.

The coal was still cut by hand. The chief idea of the introduction of the conveyor was to secure a better, safer and more easily handled working section, which would improve the speed of extraction and reduce the cost, mainly through a considerable reduction in the number of dead-work men in each section.

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*149 Park St., Sydney, N. S.

During the ordinary longwall methods of working the following men were employed in the section: Miners, 14; brushers, 7; trackmen, 2; timbermen, 3. The output was 45 tons.

The miners trammed their own coal to the main level. In the layout of the workings for the conveyor there was little actual difference in the direction of development. The faces still extended across the strike; but in place of the three parallel deeps a longwall face was laid out at an angle between the dip and strike, so that the left-hand end was the most advanced, which allowed the coal and water to gravitate to one point. The driving and formation of pillars were thus dispensed with, and the longwall system of extraction became a developing system as well.

Levels were laid out every 300 ft., and those lower down the deep, being started at a later date, were naturally behind the others, a distance that varied with the speed of travel in the advancing face.

Formerly seven or eight roads were used in the waste in each section after the coal had been extracted, but in the new system only two roads were so maintained—the main working haulage level and one other a distance of 40 to 45 ft. below it. To reach the latter, short angle deeps or slopes were driven at frequent intervals, each slope being superseded by a fresh one; but special care was taken to arrange that no part of this bottom road was cut off or abandoned unless the face from the level below was in advance of the portion thus cut off. Instead of building the walls on the down side of this level as a continuous wall, spaces were left every 10 ft. or thereabout, the length of the pack being taken along the face rather than along the road.

BOTTOM ROAD IS MADE A "SAFETY VALVE"

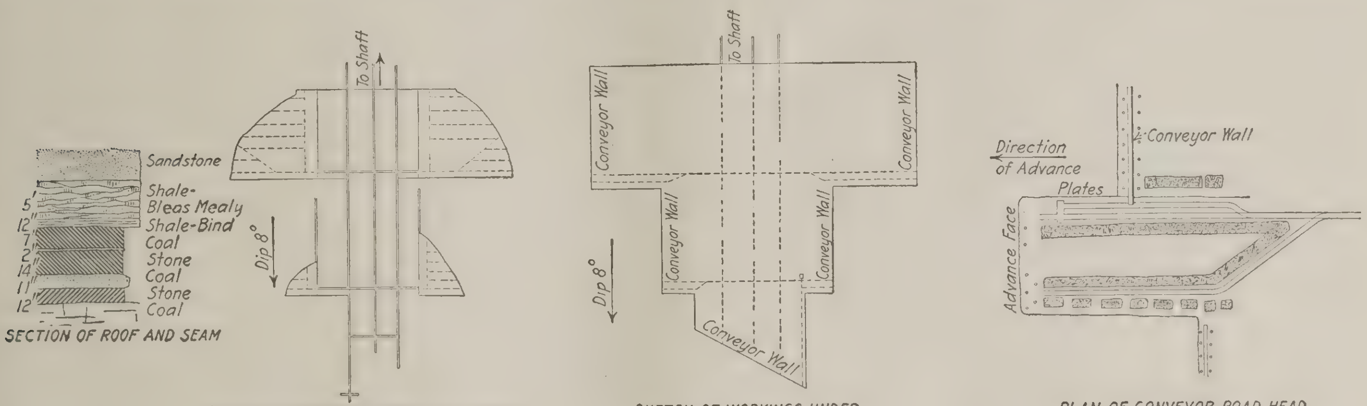
The object of driving this bottom road was solely for the purpose of obtaining a "safety valve" for roof pressure. As already stated, the roof had a decided tendency to creep downhill, and since with the conveyor working the roof "bind" was not broken at all, except by its own weight back in the waste, it was found that this movement downhill was, if anything, increased. In order therefore to provide some space into which the pressure of the roof could exert itself without causing damage to the main level, this second level was driven, and with well-built pack walls on the main level, the roof rode over it, to break in the level below.

It might naturally be inferred that the lowest level should have been the haulage road, since otherwise coal would have to be raised to the road above. In practice it was found that the cost of constantly repairing the roof and floor of the lower level when used as the haulage road was exceptionally heavy, and the idea was then adopted of moving the main road to a level higher up and allowing the roof pressure to exhaust itself into the old road. This arrangement worked satisfactorily. The extra cost of lifting the few tons of coal extracted from the face below to the level of the main road was more than compensated for by the lesser upkeep of the haulage road.

All timber, tools or other material needed for the men of the lower section is brought in by the main level of the section above, and through this lower level and the opening in the pack wall, is passed into the top of the conveyor, and hence down to the man or men requiring it. This saves considerable handling and hauling of material and supplies up a long conveyor face, and is an improvement over the old method of hauling timber to the face.

Each conveyor face is approximately 300 ft. long, at right angles to the strike, and consequently parallel to the dip and rise. The top of each face abuts on the lower waste side of the level above, at a distance of not more than 100 ft. back from the upper conveyor. Each section works in conjunction with the other, and is kept back or advanced so that this distance is maintained.

The stretch of face that is in advance of the conveyor line is worked as a two-roaded longwall section by hand to keep ahead of the conveyor, and is double-shifted. Pack walls in the conveyor face are built only on the

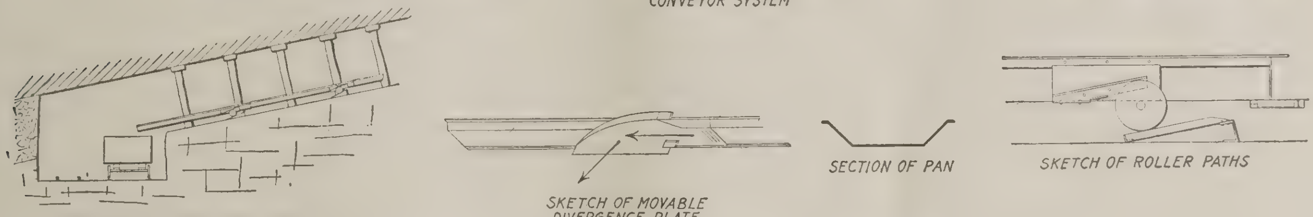


SECTION OF ROOF AND SEAM

SKETCH OF WORKINGS UNDER OLD SYSTEM

SKETCH OF WORKINGS UNDER CONVEYOR SYSTEM

PLAN OF CONVEYOR ROAD HEAD



SECTION ACROSS CONVEYOR ROAD HEAD

SKETCH OF MOVABLE DIVERGENCE PLATE

SECTION OF PAN

SKETCH OF ROLLER PATHS

SOME OF THE DETAILS OF CONVEYOR OPERATION top side of the main haulage level and in the advance face. On the whole length of the conveyor face no stone is built into position. The rock from the seam is cast back, but is not specially built into packs.

Instead a regular system of face timbering, that must be strictly adhered to, is in vogue. In this method props are set in line and at regular spacing up and across the face, the actual distance being determined by experience. This is maintained irrespective of the roof breaks, or any irregularity in the roof. Under the old system, patches of bad roof developed, but under the new arrangement, these seldom appear, and where they do, they are attended to not by putting the regular system out of line but by the addition of extra timber.

The object of this regular propping is to obtain and hold control of the roof. This has been successfully done, in a manner that could not be attempted before, and which was only made possible by the straight lines of the conveyor face. When the ordinary longwall working was in operation, the pressure of the roof was upheld upon a series of solid packs. This caused the pressure to exert itself in several directions simultaneously into the waste spaces, into the roads, into the opening between the coal and the pack walls, etc. These spaces were unequal in size and area, the supporting points were various distances apart, and so the pressure was unequally distributed, which in turn developed lines of force that ran apparently in any direction and were not, nor could they be, intelligently directed.

In the conveyor face, owing to the long stretch of free roof available, these lines of force are controlled and directed by the regular propping, and the result is the overflowing of the roof pressure in places designed for it—namely, the lower level and the waste space left behind the coal—and not into the roads and the actual working face where falls of roof can be well dispensed with.

The timber used at the conveyor is drawn as regularly as the conveyor is shifted, and as progress is more rapid than under the old system, the roof does not need to stand so long before the men operate under fresh cover. The setting of the props in a straight line, using timber pointed on the top, produces a "line of break" parallel to the face, and at each succeeding setting of the props the roof breaks at that point and falls into the waste, while the resulting pressure from the overhanging and supported piece has a beneficial effect on the breaking out of the coal. It is a fact proved in practice that this break can be accurately regulated so as to produce just the right pressure on the face of the coal.

Floor Is Lifted Instead of Brushing the Roof

At the bottom of the conveyor, or conveyor head, the layout of the roads is as shown in the sketch, and instead of the roof being broken to get the needed height the floor is lifted. The end of the conveyor projects over the roadway from the bottom of the seam, and is continually discharging into cars placed underneath it.

The amount of bottom that has to be lifted depends on the height of the cars in use; in this case 30 in. It must be lifted the full width of the double road. This will be understood when it is considered that the tonnage at this one point is 65, and that it is being delivered at a regular rate into cars, the arrival of which is intermittent. A double road is therefore necessary, both for storage purposes and to provide a passby for the empty and loaded cars. Horse haulage has been adopted from the conveyor head to the rope haulage in the "deeps."

In the operation of the conveyor face the number of men employed was somewhat as follows: Miners, 12; conveyor attendants, 5 per night; deadwork men, 2; timbermen are included with conveyor attendants.

Output, 55 Tons

In arranging the conveyor the machine is set up parallel to the line of the coal, a foot or so therefrom. A certain length of the seam is allotted to each miner, who commences at the top end of his particular length, with a breaking-in shot, if that is required. He afterward works downhill, loading out and breaking down with the conveyor operating past him, on his right- or left-hand side, but not at his back. On the 300-ft. face 12 men were at work regularly, this giving a space of 43 ft. to each man and a production per day of 55 tons.

Timber, tools and supplies come from the level above, and run down the conveyor to the man requiring them. Loading is continuous and from any point. Contrary to hand-mining practice, there has been no excessive loading periods. As a rule, and in this particular colliery, the "getting" on the whole length of the face is by contract. Otherwise it is only by measurement that each man's tonnage can be ascertained. Contracting puts each face output in the hands of one man, and the number of cars from each section can easily be reckoned at the haulage end by the usual means.

In this mine there are in all nine faces almost exactly similar. A feeling of friendly rivalry was introduced between the operators of the various faces, and at some periods of the year a bonus was paid the contractor who successfully extracted the greatest tonnage in any one fortnight. Generally speaking, the men welcomed the change from the old method to the new one. Contracting also was popular and satisfactory to both men and company. The men, after they had experience with the conveyor, were eager applicants for a contract, and the company had less overseeing work to do.

Shaking Conveyor Is Employed

The conveyor in use is of the shaking type, and has been adapted from continental practice. The height from the floor to the edge of the pan is only 9 in. This means that the workman is required to raise the coal only slightly over this height, instead of a former 29 in., which accounts for more work with decreased effort. The width is only 18 in., and this allows of the distance from coal face to waste line of props being kept at a minimum.

As shown, the conveyor rocks back and forth on rollers working in specially arranged paths. These are so designed as to cause the machine to fall sharply at the end of the forward stroke, whereby the motion imparted to the coal is continued in the material itself, while the conveyor draws back for the next stroke. The number of strokes is approximately 60 per minute, and the regulation of their length is an important feature in the design affecting the output and being influenced by the grade. In this case the grade is considerably in favor of the coal.

The principal dimensions of the driving engine are as follows: Horsepower of engine, 12; air consumption at

60 strokes per min. and 60 lb. pressure, 18 cu.ft.; stroke of engine, 5 in.; diameter of cylinder, 7 in.; weight of engine, 572 lb.

The theory of the machine is exactly that of a shaking screen. Movable sides are provided that can be taken out and placed across the conveyor, thus acting as chutes for the divergence of the coal or other material from the traveling pan. This has proved useful on not a few occasions, as any useless material can be readily shelved off the conveyor at any convenient point without the necessity of removing it by hand or loading it into cars at the foot, for disposal elsewhere.

The conveyor pan is built in 6-ft. sections which are easy to handle in confined spaces and simple to put together.

The engine, driven by compressed air, is a simple, plain, air cylinder, with broad bed-plate, which may be bolted to planks, which are in turn wedged against the roof by timber. The total width is 18 in., and the length 24 in. Connection to the conveyor is through a lever action and rigid attachment, the cylinder being placed at right angles to the line of the conveyor.

The pack walls on the top side of the driving road are uniformly built in line, 2 ft. or so back from the edge, this space being utilized for the engine. Air is furnished from a power-driven air compressor that stands in a little recess in the side of the road. The principal dimensions are as follows: Horsepower, 15; r.p.m., 960; amperes, 16.5; voltage, 500; cycles, 50; air pipe, 1½ in.; cylinders, 4; strokes per min., air cylinders, 480; pressure, 70 lb.; space occupied, 5 ft. 6 in. by 3 ft. 5 in. The air is passed through an 18-ft. hose to the air cylinder of the conveyor.

On the whole this arrangement has proved simple and reliable. The air cylinder is easily moved and held in position, while the air compressor may be shifted when the full length of hose is run out. The compressor runs on a bogie fitted with wheels to the gage of the road, and can, if desired, be placed in advance of the conveyor in the road driven ahead.

Rate of Advance Was Increased

The rate of advance changed from 160 ft. in six months under the old system to 270 ft. over the same period under the conveyor system. This is not remarkable compared to machine working advances, but it represents a considerably increased rate of extraction for handwork. The operation of each face in the colliery is regular and at the same rate, the only determining factor being the number of men employed.

Some extra organization is needed with such a conveyor face, in that it is necessary to see that the face is maintained in a straight line. This implies that it must be stripped every second or third day, depending on the rate of working from top to bottom. Otherwise there is left a "nose" of coal that interferes with the lining up of the conveyor when the time comes for shifting it. This coal has to be removed at the cost of extra labor and time.

Shifting of the conveyor takes place every second night, so as to get under the fresh rock as soon as possible; but this is governed by the rate of cutting and loading. The air engine is moved at the same time as the conveyor, but the compressor only when the length of hose is reached. The operation of shifting is accomplished by a night force of eight, who also shift the compressor when necessary and set all timber required.

Getting the conveyor ready for removal is done by unbolting the sections, after which whatever timber is to be moved is drawn section length, by section length, each section being in turn inserted in the space thus made, until the whole conveyor roughly occupies the new line, when the whole is again reconnected. The timber is again set section by section behind the conveyor, while the outside line, next the waste, now no longer required, is drawn. The original setting of the timber is done by the miners when working downhill in loading out the coal, the conveyor serving as the measurement line.

The opening-out section to the dip is operated at an angle to both the strike and dip and rise with the intention of causing any water made to gravitate to one point where it can be easily handled by a pump. Should the conveyor be placed at too flat an angle with the strike, it is apt to crawl up on the miners and has to be strongly stayed in position. There is also the trouble of the coal running entirely on one side of the conveyor and dropping over, if working extra full.

The exact angle at which the best and quickest work is performed is really a matter of experiment. There is no difference between the opening-out section and the other conveyor section in the actual operation method. It is true there are two fast ends, and consequently the coal cost is a fraction more than from the other faces; but it is much less than the rate formerly paid per ton for driving "deeps."

As this deep face proceeds it opens out on either side fresh conveyor faces that are ready to commence operations across the dip and rise without preliminary straightening or other work that would have been needed had the old policy been still in operation. The roof pressure is of course much greater in and about the center road; but once the roof has settled there is absolutely no further trouble.

Costs Were Decreased

A comparison of the costs of operation and performance accomplished by the old and the new systems has worked out much as follows:

	Hand Operation	Conveyor Operation
Tons, per man	3.2	4.6
Length of face	300 ft.	300 ft.
Tons, per section	45	55
Length of face, per man	43 ft.	40-50 ft.
Number of miners	14	12
Number of deadwork men	12	2
Number of conveyor men	...	1
Shifting conveyor	.. (Average per night)	4
Number of roads to maintain	7	2
Tons per road	6.4 Main level Bottom "	49.00 6.00
Time stripping	9 hr.	9 hr.
Distance bottom level in advance	....	40 ft.
Costs		
Cutting Shooting Loading	0.72	0.72
Brushing	0.41	(Done by squad shifting conveyor.)
Maintaining roads	0.08	0.08
Tramming	(Included with shooting and loading)	(Included for lower level in tonnage rate)
Shifting conveyor	....	.15
Operating conveyor	....	.03
	$1.21	$0.98

It will be seen that the saving in cost finally effected is entirely due to the elimination of roof troubles, which the conveyor system made possible. There are now installed 10 conveyor faces, and because of their success they are likely to be extended.

Coal Holdings of the New York Central R.R.

A phase of the New York Central's investments one hears little enough about is its coal-land holdings and developments. Few, if any, of these have reached the stage of paying direct money returns as dividends, and probably they will not for an indefinite time to come. The reason is that they have been acquired almost solely with a view to creating a fuel reserve for the Vanderbilt system. Cost of locomotive fuel or of power-house fuel, as the case may be, is becoming a more serious problem to most railroads every year. Apparently the Vanderbilt roads have solved it as far as it can be solved.

Among the investments of the Central is all the stock, $825,000, of the Clearfield Bituminous Coal Corporation, owning and controlling coal lands and mines in central Pennsylvania. It owns in fee 47,000 acres and leases 12,000 acres, besides owning the equity in various tracts aggregating about 80,000 acres subject to underlying mortgages. The corporation produces no commercial coal, its entire present output being taken by the Central and affiliated roads. The company does not wholly meet its fixed charges, but it is the means of assuring the eastern half of the system an ample fuel supply at reasonable prices.

West Virginia Properties

In 1905 the Pittsburgh & Lake Erie reached into the break-up of the ambitious Gould project for an eastern seaboard system and pulled out the remaining properties of the Little Kanawha Syndicate at a price approximating $8,600,000. These consisted of a variety of scattered short railroads in West Virginia and some really valuable coal lands. Subsequently the Pittsburgh & Lake Erie sold a half interest in these properties, equally divided between the Pennsylvania and the Baltimore & Ohio, practically at cost. The Monongahela R.R., which connects with the Pittsburgh & Lake Erie and is owned jointly by it and the Pennsylvania, has been extended south to the Pennsylvania-West Virginia state line. From that point the construction of the Buckhannon & Northern, one of the syndicate roads, has lately been completed to Rivesville, W. Va., and in the Fairmont district.

By means of the joint route just described and trackage over the Baltimore & Ohio the Vanderbilt lines and the Pennsylvania reach a tract of 57,000 acres of coal land about to be opened up. For portions of this tract the owners have been offered a price per acre that represents a valuation of $12,000,000 on the whole. The three big systems are working in harmony to divide the traffic here created, with the lion's share to the chief owner, the Central's subsidiary.

Sources of Coal Further West

Aside from the Fairmont tract, the syndicate holdings include at least one other West Virginia coal area of importance, besides odds and ends of railroad and right-of-way which will presumably become useful as the industrial development of West Virginia proceeds. In comparison with the value of the coal and that of a fuel supply, the carrying charges on the original investment are insignificant.

Further west there are additional coal reserves, the Big Four having recently acquired 37,000 acres and the Lake Shore 74,573 acres of coal lands in Illinois. The Lake Shore's purchase involved an expenditure of $2,399,659. Here, as elsewhere, the primary object of the acquisition is the assurance of an adequate fuel supply, though commercial coal is being produced from some of these properties.

Everyone knows that the New York Central lines are not largely carriers of coal; that is, coal is under 30 per cent. of their tonnage as against 50 per cent. to 60 per cent. for such coalers as the Baltimore & Ohio, Pennsylvania and Norfolk & Western. But everyone does not know that they have a firm foothold in the three most important coal fields in the country, with something like 300,000 acres of coal lands owned or under lease. Possibly they, with other railroads, will some day run up against an amended and fortified commodities clause, so far as the commercial working of these fields is concerned. But by that time the location of mine branches will presumably have assured them the traffic from these holdings or parts thereof under other ownership. It is not likely that they will be prevented from exercising the ordinary business prudence of retaining a stock of unmined locomotive fuel.—"Boston News Bureau."

Coal Resources and Imports of Chile

Coal mining in Chile has shown a steady development in the past 10 years, says Consul General Leo J. Keena in *Commerce Reports*. In 1904, 751,628 metric tons were mined in the republic, and in 1913, 1,283,450 metric tons. The 1913 production, while less than that of 1912 (1,334,407 metric tons), was 95,397 metric tons greater than that of 1911. The price of locally mined coal in 1904 averaged $4.38 per metric ton and in 1913, $6.94 per metric ton.

The following is a list of the coal-mining companies in Chile in 1913, with the location of the mines and their gross production in metric tons of 2204.6 lb.:

Companies	Location of Mines	Production in Tons
Anibal 20 Zañartu	Tome	2,000
Cia. Carbonifera de Lirquén	Penco	30,000
Cia. Minera de El Rosal	Penco	18,000
Cia. de Lota y Coronel	Lota	291,308
Cia. de Lota y Coronel	Coronel	41,692
Cia. de Lota y Coronel	Coronel	12,763
Cia. de Lota y Coronel	Coronel	14,017
Cia. Carbonifera y de Fundición Schwager	Coronel	370,000
Suc. Rojas Miranda	Lota	10,000
Cia. Carbonifera (Los Rios de Curanilahue)	Carampangue	11,977
Cia. Carbonifera (Los Rios de Curanilahue)	Lebu	183,673
Cia. Carbonifera Victoria de Lebu	Lebu	16,000
La Cia. de Arauco (Ltd.)	Carampangue	37,032
La Cia. de Arauco (Ltd.)	Lebu	180,270
Cia. Carbonifera (Los Rios de Curanilahue)	Lebu	49,828
Cia. Carbonifera Millahuillin	Valdivia	600
Agustin Ross	Punta Arenas	14,200
Total		1,283,450

These mines employed 8414 persons, of whom 5929 were underground workmen. The average daily wages paid for underground work were approximately $1 United States currency per day.

The imports into Chile of steam, gas and other coals during the past five years were as follows: 1910, 1,293,000 tons; 1911, 1,367,874 tons; 1912, 1,524,652 tons; 1913, 1,540,747 tons; and 1914, 877,650 tons. The quantity given for the year 1913 is in accordance with the annual statistical returns of the Chilean customs authorities and came from the following countries: United

Kingdom, 924,430 tons; Australia, 457,873 tons; United States, 98,979 tons; Germany, 45,477 tons; Belgium, 13,413 tons; Netherlands, 575 tons; total, 1,540,747 tons.

The quantity given for 1914, 877,650 tons, may be taken as a fair approximation to the imports for that year, though the official statistics are not yet available. The total may be divided as follows: English coal, 453,999 tons; Australian coal, 407,601 tons; United States coal, 16,050 tons; total, 877,650 tons. During the second half of 1914 the imports were as follows: Australian coal, 257,204 tons; English coal, 192,493 tons; United States coal, 16,050 tons; total, 465,747 tons. The statistics for 1914 have been obtained from commercial reports compiled in the port of Valparaiso, which is the center for the coal import trade of Chile.

Decline in Use of Permissibles

The total production of explosives in the United States during the year 1914, exclusive of exports, according to figures compiled by Albert H. Fay, of the United States Bureau of Mines, was 450,251,489 lb., or 225,126 short tons, as compared with 500,015,845 lb., or 250,008 short tons for 1913. The production for 1914 is segregated as black powder, 206,099,700 lb.; "high" explosives other than permissible explosives, 218,453,971 lb.; and permissible explosives, 25,697,818 lb.

The figures represent a decrease as compared with 1913 of 23,839,831 lb. of black powder, 23,932,573 lb. of high explosives and 1,987,952 lb. of permissible explosives.

Mr. Fay says: "In the year 1902 only 11,300 lb. of permissible [or rather short-flame] explosives were used in coal mining, whereas in 1913 the quantity of permissibles so used was 21,804,285 lb., as compared with 19,593,892 lb. in 1914. The quantity of permissible explosives used in the United States is larger than in a number of foreign countries. In 1912 it represented about 5 per cent. of the total quantity of explosives produced and in 1914 5.7 per cent. The total amount of explosives used for the production of coal in 1914 was 220,622,487 lb., of which about 8.9 per cent. was of the permissible class, as compared with 9.5 per cent. in 1913."

Reasons Why Anthracite Mining Is Expensive

There are some important differences in the cost of mining anthracite and bituminous coal with which the general public is not familiar. The following table shows the total production of explosives in pounds in the United States, according to the United States Bureau of Mines, and the amount of the various kinds of explosives used in Pennsylvania to produce 91,626,964 tons of anthracite coal and 172,965,652 tons of bituminous coal in 1913:

	Black Powder	High Explosives	Permissibles
All mines in the United States	194,146,747	241,682,364	27,685,770
Pennsylvania anthracite region	44,001,660	16,093,035	3,323,645
Pennsylvania bituminous region	14,652,931	696,162	6,715,028

Thus it can be seen that the anthracite region used almost as much "permissible" explosive in proportion to coal produced as the bituminous region. The presence of gas in sufficient quantity to be detected on an ordinary safety lamp makes the use of permissible explosives advisable, if not absolutely necessary, to prevent explosions being caused by the flame of the black powder so commonly used for blasting coal. The mining of anthracite consumed over three times as much black powder and 23 times as much "high" explosive as the mining of bituminous coal, despite the fact that only half as much coal was produced.

The figures given are probably reasonably correct, though the operators only know what powder they sell to their employees and keep no track of what is purchased from other sources. However, the amount so purchased is probably not large. Of course the larger consumption of powder partly arises from the fact that the anthracite miner "lets powder do the work." If the bituminous operator invariably shot his coal off the solid, he could pay his pick miners a lower rate per ton and would nevertheless pay them more per day if he could only sell the product. The greater consumption of powder in the anthracite region is therefore not without its advantages in the production of cheap, though less marketable, coal.

In addition to this heavy charge for explosives, anthracite has to be put through an elaborate process of manufacturing, and this is one of the reasons why 20 per cent. of the cost of preparing the coal for market is incurred after the coal has been removed from the ground. Great factories, called "breakers," erected for this purpose cost $200,000 to $400,000 and even $500,000. As compared with these mammoth structures the "tipples" of bituminous mines are relatively inexpensive.

Lake Vessels Transferred to the Ocean Trade

Following the decision of the Interstate Commerce Commission that package freight vessels owned by railroads on the Great Lakes must be disposed of, the roads have opened negotiations for the sale of their vessel property to ocean companies. The Erie Railroad Co. has already sold four and the Western Transit Co. is calling for bids for putting one of its ships in shape to go to the coast.

W. J. (Fingy) Conners, a millionaire of Buffalo and owner of a stevedore company operating in a number of lake ports, is at the head of a syndicate negotiating for the remaining package freight boats on the Lakes. Sixty-two package freight boats are affected by the commission's order.

The Erie has sold to William G. Davidson, president of the Staten Island Shipbuilding Co., the steamers "Owego," "George F. Brownell," "John G. McCullough," and "Granville A. Richardson." The "Owego" is 325 ft. long, 41 ft. beam, and 14 ft. deep, with a gross registered tonnage of 2611. The "Brownell" is a duplicate of the "Owego." The "Richardson" is 256 ft. long, 41 ft. beam, and 28 ft. deep, with a gross registered tonnage of 2237. The "McCullough" is 255 ft. long, 40 ft. beam and 21 ft. deep, with a gross registered tonnage of 1895. The "Owego" has been cut in two and is on her way to the coast. The "Richardson" and "McCullough" can go as they are. The "Brownell" is being remodeled at Buffalo, N. Y.

The ships that cannot be taken to the coast because of the limited size of the canals will remain under independent management. The ships that have been sold were built between 1888 and 1893. The newer boats, about 20 in all, are mostly too large for the canals.

Coal Handling at Panama

SYNOPSIS—This summer will see the completion of the two great coal-handling plants on the Panama Canal. The plant at Cristobal, on the Atlantic side, has a storage capacity of 400,000 tons, and that at Balboa, on the Pacific side, a little over 200,000 tons, divided into piles. The Cristobal plant will be capable of handling 2000 tons per hour and the Balboa plant about one-half that. The total cost, substructure and superstructure, will be about three and a half million dollars. Some wet-storage capacity is provided.

For military and commercial reasons it becomes necessary to provide in the Canal Zone great coal-handling plants. At this time it is not possible to estimate closely the quantity of coal these plants will handle yearly, but based upon the expected canal traffic and the amount of coal transferred at the entrance of the Suez Canal, it is assumable that in time the Isthmus may be expected to handle upward of one million tons a year.

Two plants are provided, one at Cristobal, Fig. 1, on the Atlantic side of the Isthmus, and one at Balboa, Fig. 2, on the Pacific side. The former will have a solid storage capacity of 485,000 tons, while the capacity of the latter will be 215,000 tons. This is based on short tons of 2000 lb. each, or on 40 cu.ft. per ton. If, however, the coal is divided into piles, as it probably will be, it will reduce the capacity below these figures. For example, in case the coal at the Cristobal plant is divided into 37 piles, the collective capacity will be not far from 400,000 tons. Of this storage capacity, and at the request of the Navy Department, 100,000 tons of wet storage is provided for at Cristobal and 50,000 tons at Balboa. The wet-storage capacity is to provide for the permanent storage of large amounts of coal without it being subjected to the deterioration in quality that occurs in long exposure to the air, and it also will avoid the loss in damage through spontaneous combustion, although the machinery is so equipped that burning coal may be easily transferred to places where it can do little damage. Wet-storage may not be used except in case of war.

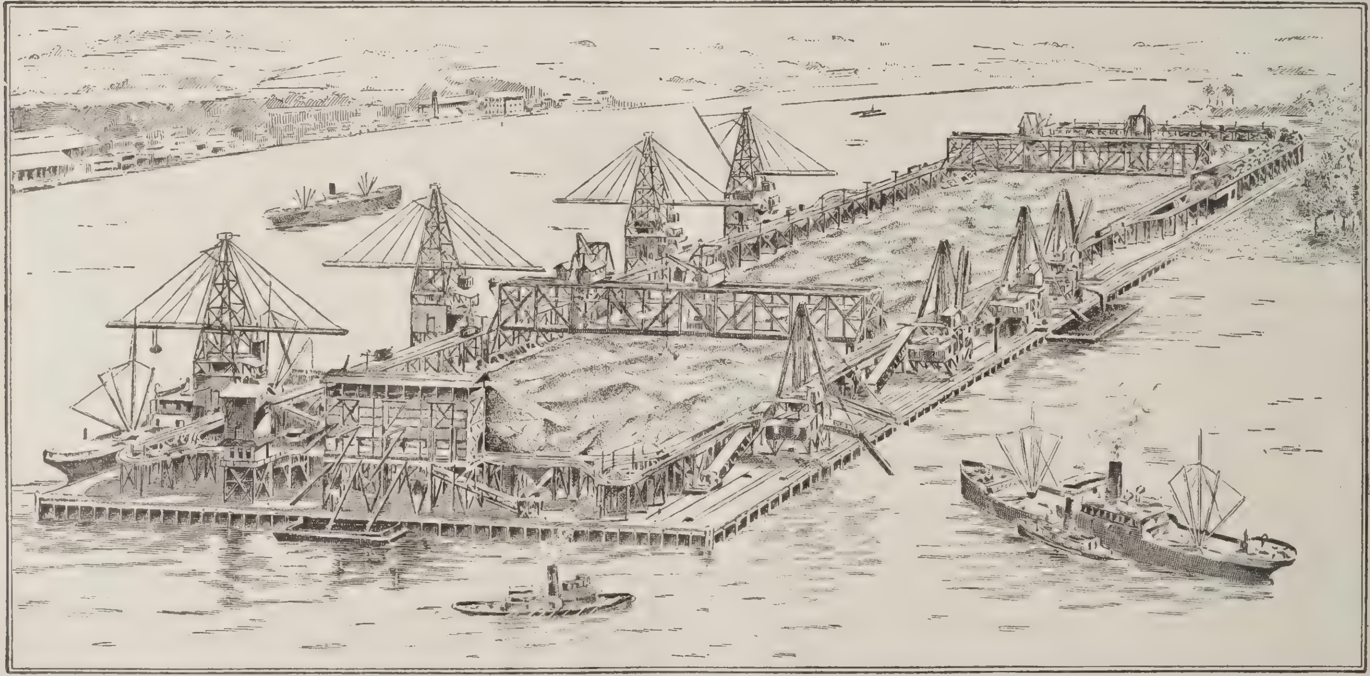


FIG. 1. COAL-STORAGE PLANT AT CRISTOBAL, CAPACITY 485,000 TONS

The plans and sectional elevations, Figs. 3 and 4, indicate clearly how the plants are laid out.

The substructure of the Cristobal plant is made up of three large wharves. One at the long side of the pier is designated as the unloader wharf, and at the other side is the reloader wharf. The connecting wharf between the two at the water end of the coaling plant is known as the end wharf. A depth of 41 ft. at mean sea level has been provided for a distance of 1965 ft. along the unloader and the reloader wharves, and also at the end wharf. The plant has about 2500 lin.ft. of berthing space, with 41 ft. depth at mean sea level, and as the tide does not fall more than one foot below sea level, deep-draft vessels can be accommodated at any stage of the tide. The decks of all wharves are 10 ft. 6 in. above the mean sea level.

Referring to Figs. 1 and 3, the coal pile is spanned by two movable steel structures, known as the stocking and reclaiming bridges, which are capable of traveling the length of the pile, or about 1000 ft. These bridges are of heavy steel construction and supported on 32 wheels at each end, the unloader wharf affording support for one of them and the reloader wharf for the other. These bridges are a little over 315 ft. long. The upper chord of each supports moving units known as bridge diggers, each of which consists chiefly of a bucket that can command any part of the storage pile. It will be seen from Figs. 1 and 3 that while the bridge moves longitudinally of the pile, the bridge diggers move longitudinally of the bridge.

On the unloader wharf there are provided four great unloader towers, a good view of which is shown in Fig. 3. These have a travel of slightly more than 1000 ft.

and command the length of deep-water berth on the unloader side of the plant. Their function is, of course, to unload coal from colliers and barges. The reloader wharf affords support for four moving units known as reloaders, and the maximum range of travel of these is such that they command practically all of the deep-water berth on the reloading side of the plant. The end wharf affords support for a wharf bunker of 15,000 tons' capacity, which is provided for the supply of coal to tugs and other comparatively small craft, thus making it unnecessary to start the plant to furnish small amounts of coal. The unloaders are operated by steam, while the remainder of the plant is operated by electricity. All parts are electric lighted throughout.

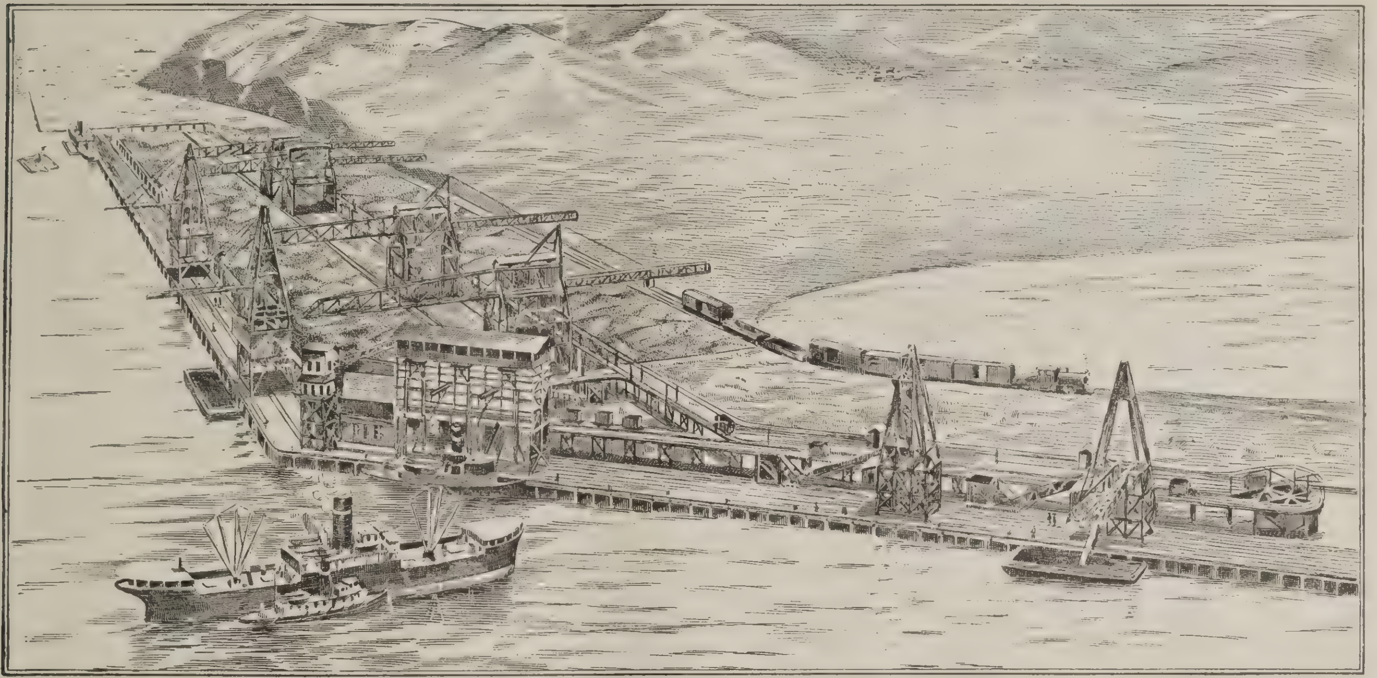


FIG. 2. COAL PLANT AT BALBOA, CAPACITY 215,000 TONS

The Panama Canal supplies electric current for the coal plant at 2300 volts to a substation on the west bank of the plant. The current is kept down to 440 volts for power and 110 for lighting, some of the necessary transformers being located in the moving units themselves and the remainder in the substation mentioned. The 2300-volt current will be supplied from the main Cristobal substation and will be brought to the coaling-plant substation, submarine cables being used to effect a crossing of the French canal which separates the coaling plant from the mainland.

An interesting point to note is that the tracks on stocking and reclaiming bridges are of the standard 5-ft. gage of the Panama Railroad, and they will be connected at the south end to the lines of this railroad. Thus there will be four parallel lines of standard-gage tracks extending the full length of the plant and connecting two of the main lines of the Panama Railroad. This will, of course, effect the convenient transportation of coal to and from the storage plant by rail.

Briefly, the substructure consists of steel and concrete decks supported by concrete cylinders 6 ft. in diameter, founded on solid rock. The spacing of the cylinders is largely dependent on the spacing of the rails for the support of the moving units, and the design of the deck framing has also been largely influenced by the position of the superimposed load. The deck-structure framing consists of steel plate-girders and beams. In all there was required about 5000 tons of structural steel and 18,000 cu.yd. of reinforced concrete. To support these decks, which have an area of about 200,000 sq.ft., 306 concrete cylinders, 6 ft. in diameter and ranging between 50 and 75 ft. in length, were required. These foundations were necessary inasmuch as the loads to be carried will, in many cases, be very heavy; for example, a load imposed on the substructure by one end of the stocking and reclaiming bridge can reach a maximum of nearly 1000 tons. The substructure of the Balboa plant is similar to that at Cristobal.

For loading and stocking, coal is taken from colliers or barges by one or more of the unloaders, which are equipped with $2\frac{1}{2}$-ton buckets and have a normal rated capacity of 250 tons per hour each, or the four unloaders at Cristobal have a combined unloading capacity of 1000 tons per hour. The coal is delivered to cars running on the elevated railroads. Each car has a capacity of 10 tons and runs at a speed of 200 ft. per min. The cars are stopped and started by a trackman on the viaduct, no attention being necessary when they are in motion.

As shown in the drawings, the cars open at the bottom and are dumped by the trackman. Throwing of switches is avoided, as the cars are started and travel to the desired point over a predetermined route. For stocking, the cars must dump at some point over the coal pile, and this is done from a track at about the level of the lower chords of the stocking and reclaiming bridges, which track is connected with one of the elevated tracks on the viaduct, paralleling the bridge track by means of a sliding switch that moves with the bridge and guides the cars onto the bridge.

The coal is reclaimed from storage by one or more of the four bridge diggers that run on the top chords of the restocking and reclaiming bridges. Each of these bridge diggers is equipped with a 5-ton bucket and has a normal

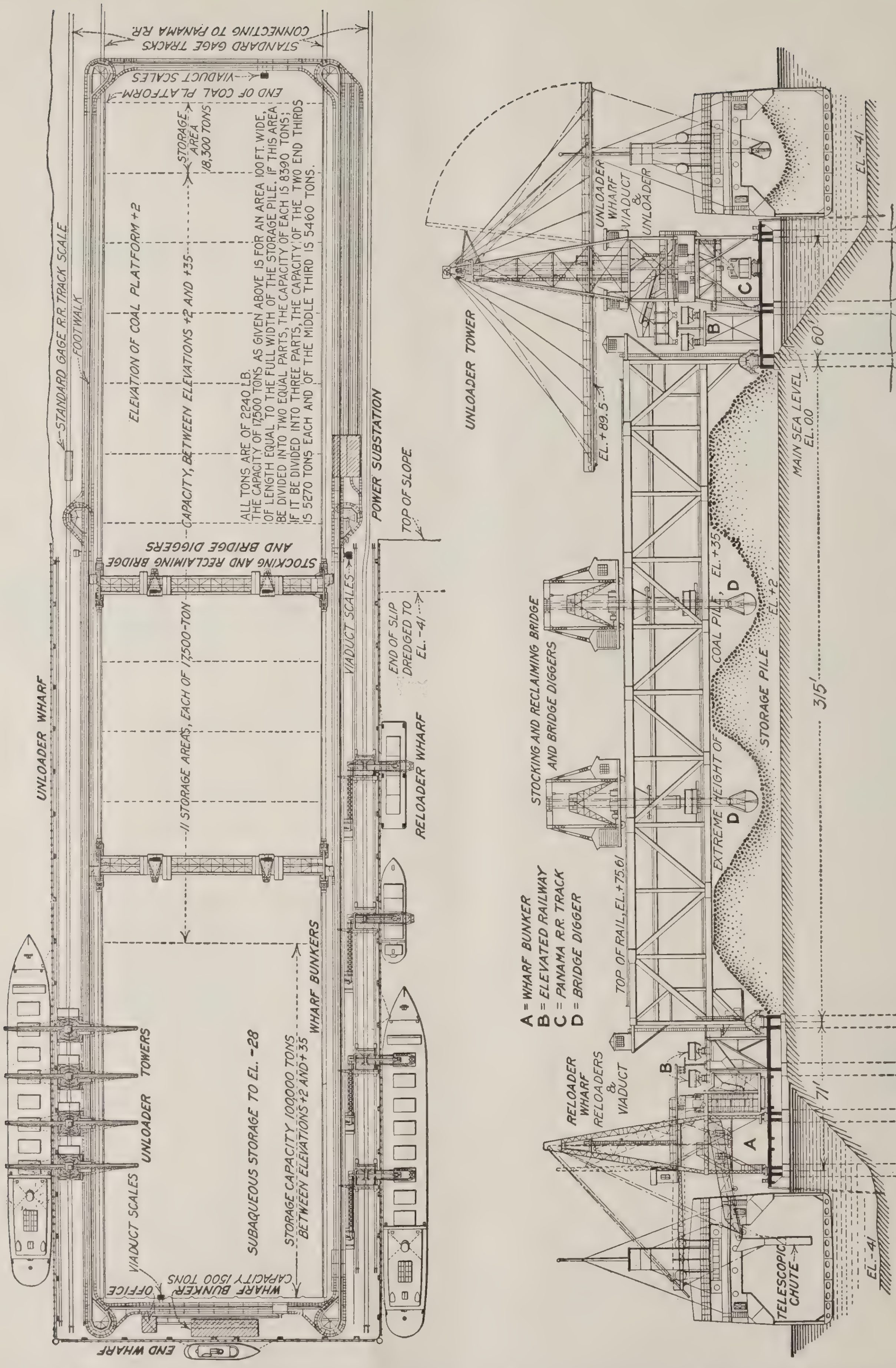

STANDARD GAGE TRACKS CONNECTING TO PANAMA R.R.
VIADUCT SCALES
END OF COAL PLATFORM
STORAGE AREA 18,300 TONS
STANDARD GAGE R.R. TRACK SCALE
FOOTWALK
ELEVATION OF COAL PLATFORM +2
CAPACITY, BETWEEN ELEVATIONS +2 AND +35
ALL TONS ARE OF 2240 LB. THE CAPACITY OF 17,500 TONS AS GIVEN ABOVE IS FOR AN AREA 100 FT. WIDE, OF LENGTH EQUAL TO THE FULL WIDTH OF THE STORAGE PILE. IF THIS AREA BE DIVIDED INTO TWO EQUAL PARTS, THE CAPACITY OF EACH IS 8390 TONS; IF IT BE DIVIDED INTO THREE PARTS, THE CAPACITY OF THE TWO END THIRDS IS 5270 TONS EACH AND OF THE MIDDLE THIRD IS 5460 TONS.
POWER SUBSTATION
TOP OF SLOPE
STOCKING AND RECLAIMING BRIDGE AND BRIDGE DIGGERS
VIADUCT SCALES
END OF SLIP DREDGED TO EL. -41
UNLOADER WHARF
11 STORAGE AREAS, EACH OF 17,500-TON
RELOADER WHARF
WHARF BUNKERS
UNLOADER TOWERS
VIADUCT SCALES
SUBAQUEOUS STORAGE TO EL. -28
STORAGE CAPACITY 100,000 TONS BETWEEN ELEVATIONS +2 AND +35
WHARF BUNKER CAPACITY 1500 TONS
OFFICE
END WHARF
UNLOADER WHARF VIADUCT & UNLOADER
EL. -41
UNLOADER TOWER
EL. +89.5
C
B
60'
MAIN SEA LEVEL EL. 0.0
EL. +35
COAL PILE
D
EL. +2
STORAGE PILE
EXTREME HEIGHT OF
315'
STOCKING AND RECLAIMING BRIDGE AND BRIDGE DIGGERS
TOP OF RAIL, EL. +75.61
D
A = WHARF BUNKER
B = ELEVATED RAILWAY
C = PANAMA R.R. TRACK
D = BRIDGE DIGGER
RELOADER WHARF RELOADERS & VIADUCT
B
A
71'
TELESCOPIC CHUTE
EL. -41

FIG. 3. PLAN AND SECTIONAL VIEWS OF THE COAL-STORAGE PLANT AT CRISTOBAL, PANAMA CANAL

capacity of 500 tons per hour, giving a total hourly capacity of 2000 tons. The reclaimed coal is delivered by suitable hoppers and valves in cars that transport the coal to the desired points, which may be near the unloaders, wharf bunkers, or to parts of the storage pile, by means of the stocking and reclaiming bridge.

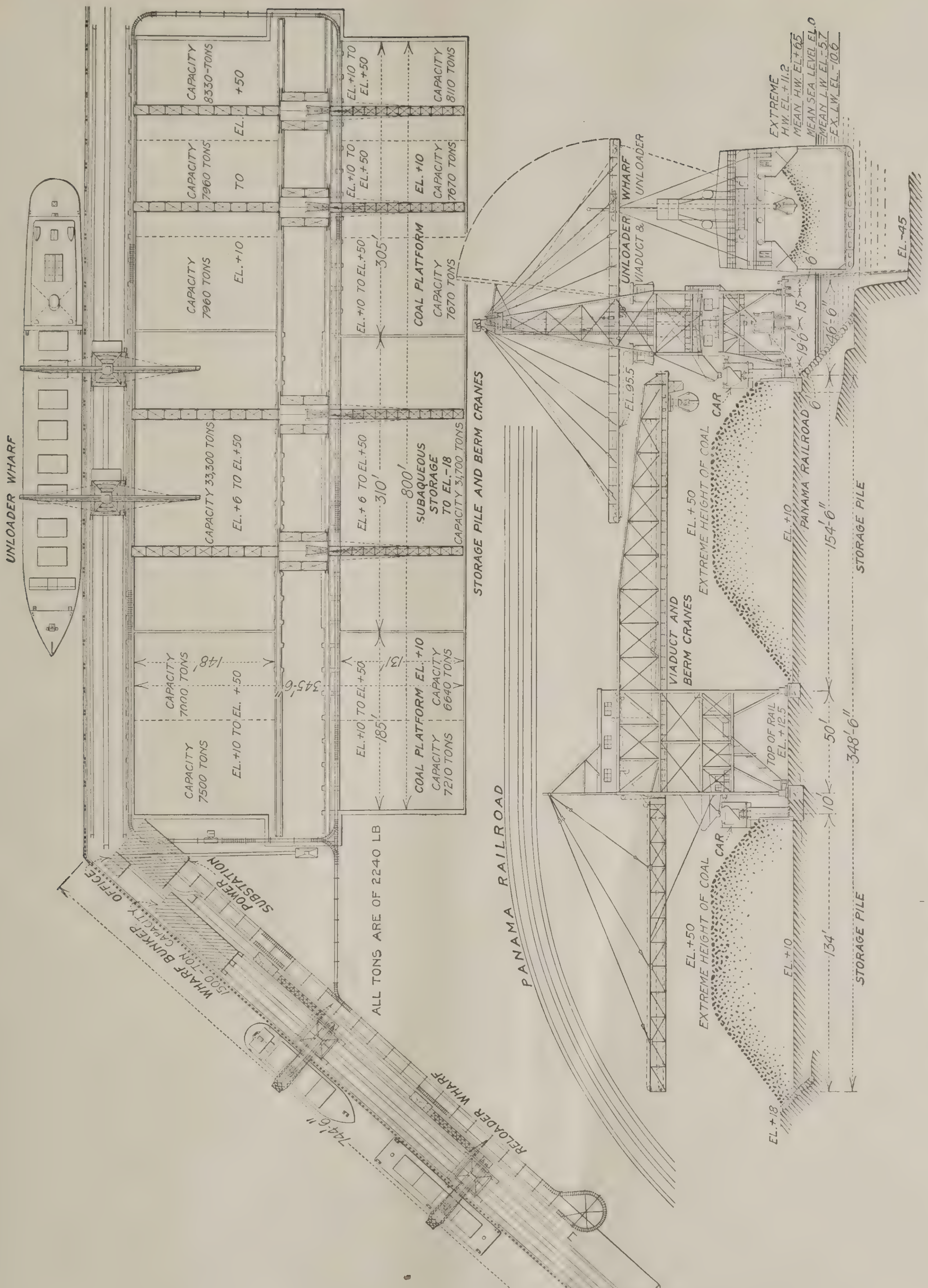


FIG. 4. PLAN AND SECTIONAL VIEWS OF COAL-STORAGE PLANT AT BALBOA, PANAMA CANAL

The wharf bunker receives its coal by means of a series of belts fed from a hopper into which the coal is dumped from cars. The reloaders are also supplied with coal by belts. Each reloader is provided with an appendage known as a trailer, consisting essentially of a hopper supported on wheels, which receives coal from the cars and delivers it to an inclined belt supported by a truss that connects the wheeled hopper to the reloader proper. The trailer therefore travels with the reloader. From this inclined belt the coal is delivered to a second belt, carried by the reloader proper, and supported by a hinged truss capable of considerable range of motion in a vertical plane and fitted at its swinging end with a hinged telescopic chute. The hinged truss and chute are raised and lowered by a steel-wire rope passing over sheaves secured to the tower structure and actuated by drums.

It will be seen that these reloaders have a considerable range of point of discharge and that they take the place of the heavy and expensive wharf bunkers usually provided in large coal-handling plants. They are comparatively inexpensive and afford a range in capacity of discharge equal to that of a high wharf bunker.

The coal is weighed by semiautomatic scales provided at points along the elevated railroad, and the operating routes are such that a car must pass over a scale before reaching its point of discharge. A set of standard railroad scales is also provided for the railroad track at the wharf level, so that the weight of coal delivered to standard-gage railroad cars by the unloaders may be duly ascertained and recorded.

Signals and Capacities

A complete system of communication and signals, both visible and audible, is provided. Electric illumination is profusely provided, so that work may be carried on at night. It is not expected that the unloaders will be able to be worked at the same capacity at night as in the day, but every signal device, illumination, communication, control, etc., has been provided to reduce the loss of time to a minimum.

To provide for the safety of those operating the machinery, it was specified that no operation calling for high speed should require the simultaneous thought or action of more than one man. In the design of the machinery, consideration was given to the possibilities of protecting operators from the fumes and gases when removing burning coal. It was also stated in the specifications that each plant and the arrangement and character of its component parts should be such that failure of one part only should not bring the entire plant to a standstill. This referred especially to the conveyor system, wherein bypasses, intermediate storage hoppers, parallel lines, etc., should be provided to enable the handling of coal into and out of storage to proceed continuously and at as great a percentage of the normal rate as practicable, in the event of a breakdown of any part.

The operations of which the various elements of the plant shall be capable are of interest. Each unloading tower is capable of mining coal from the vessels and depositing it in the hopper built into the tower, whence it may be delivered through chutes to the conveying system or to standard 5-ft. gage railroad cars. The tower must also mine coal from the vessels and deposit it by buckets or shovels on the storage pile behind the towers; and it must mine coal from the storage pile behind the towers and deposit it in the hopper built into the tower; and it must mine coal from the storage pile and deposit it by buckets or shovels aboard vessels.

Each stocking and reclaiming bridge must be capable of restocking coal into any part of the storage pile by means of a part of a conveyor system supported by the bridge, and must reclaim coal from any part of the pile and deliver to the conveyor system. In addition to this it must be capable of stocking and reclaiming simultaneously, each at full normal rated capacity.

Functions of Conveying System

The conveying system has many duties. It is capable of receiving coal from a single unloading tower, or group of towers located anywhere on the wharf and transporting it to any part of the storage pile. It also receives coal from a single unloading tower or group of towers located anywhere on the wharf and transports it direct to the reloaders, which may be spaced at any interval along the unloading wharf, and delivers it to one only, or distributes it among any number of reloaders. The aim is to distribute the coal approximately equally among any number of reloaders in action. The conveying system can also receive coal from a single unloading tower or from two towers located anywhere on the wharf, and transport it direct to the wharf bunkers. It was stipulated in the specifications that the capacity of the conveying system leading to the wharf bunker must be sufficient to handle the maximum discharge from two unloading towers. The system is capable of receiving coal from a single unloading tower or group of towers located anywhere on the wharf, as when unloading but one vessel and transporting it to any part of the pile, while at the same time coal is being reclaimed from any part of the pile and being conveyed to reloaders or to the wharf bunker. It also is capable of receiving coal simultaneously from two vessels located anywhere along the unloading wharf and transporting it from both vessels to the same part of the pile, to the reloaders direct, or to the wharf bunker direct. If coal from both vessels is being transported to the storage pile, it is possible simultaneously to reclaim coal from any other part of the pile, by means of running the bridge or bridges, and transport the coal to the reloaders direct, or to the wharf bunker direct. The system is also capable of taking coal from any part of the storage pile and depositing it at any other point of the pile by the use of the bridges.

The plant at Balboa has only about half the capacity both in storage and in handling as has the plant at Cristobal. From the foregoing description and from the illustrations the differences in the two plants are readily seen.

All of the machinery, with the exception of the six unloader towers—four for Cristobal and two for Balboa—were furnished by the Bergen Point Iron Works, the contract price being $1,347,392. The unloader towers were furnished by the Hunt Construction Co., the contract price being $485,736, making a grand total of $1,833,128 for the machinery. These figures, with a statement in the specification to the effect that "the fact that the cost of substructure which will be furnished by the Commission will be the greater part of the cost for the entire plant should be kept in mind in the design of the coal-handling installations," would indicate that the total cost of both plants exceeds $3,500,000.

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Inspection of Illuminants in Alabama Mines—The law enacted by the legislature of Alabama in 1911, regulating the inspection and use of illuminants in mines and sales of illuminants for the use of miners, and devolving the duty of inspection upon the chief mine inspector, is constitutional. (Alabama Supreme Court, ex-parte Burgin, 68 Southern Reporter, 49.)

Meeting of the Rocky Mountain Coal-Mining Institute

Mention was made in an earlier issue of *Coal Age* of the summer meeting of the Rocky Mountain Coal-Mining Institute, which was held at Trinidad, Colo., June 8-10. A full account of the meeting was held over, pending the receipt of complete and corrected copies of the papers that were read.

The meeting was called to order by President Weitzel. The members were welcomed to Trinidad by Mayor Taylor and A. L. Bramson, the latter a representative of the local board of trade. The transaction of routine business occupied the morning session. In the afternoon R. C. Hills, of the Victor-American Fuel Co., read an interesting paper entitled "Coal and Coal Fields of the Rocky Mountain Region."

The second day of the convention was devoted to a trip to Cokedale, Segundo, Primero and Tercio in a special train over the Colorado & Wyoming R.R. On this trip were 290 members and friends. The party arrived back in Trinidad at 6 o'clock in the evening.

The third day was devoted partly to business and to the reading of a paper on "Advantages of Social Welfare" by David Griffiths. Following Mr. Griffiths' paper was another on "The Use of Electric Safety Lamps" by A. E. Thompson. The afternoon of June 10 was devoted to a visit to the Victor-American Fuel Co.'s mines at Hastings and Delagua. The party returned at 6 p.m. and attended a banquet at the Cardenas Hotel at 9 o'clock, 158 members being present.

The membership of the Rocky Mountain Coal-Mining Institute now totals 485, which is quite remarkable for the short time the institute has been in existence.

The paper on "Advantages of Social Welfare" by David Griffiths follows:

The word "welfare" has a broad, comprehensive meaning. The Universal dictionary defines the word as follows: "The state of faring well; a state of exemption from misfortune, trouble, calamity, or evil; the enjoyment of health and prosperity; wellbeing, success, prosperity." So the word "welfare" covers all that can be done for the protection, comfort and happiness of our coal miners and their families.

In no other line of endeavor during the past decade have corporate interests and employers of labor shown so much zeal and interest as they have in the welfare of their employees. It is a world-wide movement. Its object is to create harmonious relations between employees and employer for the purpose of obtaining greater efficiency and averting industrial conflicts. Much has been done toward this end for the coal miners of Colorado, and much more can be done that will stand to produce the desired results.

As an example of what can be accomplished along these lines, I will quote in brief an article that I read some months ago in one of our magazines:

> A few years ago an English syndicate purchased a large vineyard and orange grove in southern California. After the preliminary work of organizing, the directors of the organization selected an old English horticulturist of wide and varied experience in the plantations of the West Indies to take charge of the property. He in turn engaged several subordinate officers from the agricultural colleges who were theorists and not practical men. The manager and the overseers were paid a handsome salary and they lived on the fat of the land. To do the manual labor on the farm they hired about 200 coolie laborers to whom they paid 50c. per day and their maintenance. The laborers lived in hovels, shacks and dugouts that were vermin-laden and unsanitary.
>
> Their food was of the poorest and quite scanty. Year after year with theoretical management and coolie labor the enterprise was a financial failure. Finally the board of directors came to the conclusion that some kind of a change had to be made or dispose of the property. Rather than dispose of the property at a great loss, the board decided on placing a young, progressive American in charge of the property, who had but very little experience with grapevines or orange trees, but had made a study of the welfare of employees. He in turn selected two experienced grape and orange growers as overseers. Their first move was to provide the laborers with clean, wholesome and palatable food and plenty of it. Then they went to work and built commodious living quarters for about 80 men. After this was done they advanced the wages from 50c. to 75c. per day and started a system of elimination whereby the indolent, unclean and inefficient had to leave the service.
>
> While these improvements and somewhat drastic changes were going on, the board of directors were very uneasy. However, the manager insisted that the money expended and the changes made would in the end bring about the desired results. The first year under the new management a great sum of money was expended on betterments and equipment. The second year a small profit was made on the whole investment. The third year 75 men well-fed and otherwise comfortably provided for did all the manual labor on the farm with the exception of harvest time, and instead of having an overseer over 15 or 20 men the two overseers did all the directing. The manager and overseers dined at the same table as the laborers, and their living and sleeping quarters were alike. Peace, law and order reigned supreme. Harmony and mutual interest was their slogan. Now under the complete revolution of affairs the syndicate is receiving a handsome interest on the money invested, and they would not dispose of the property for double the money they originally paid for it. Moral: Treat your employees right and just and your success is assured; or, any reasonable amount of money spent on the welfare of employees is a good investment.

Granting that the foregoing illustration is an extreme case, if such good can be accomplished in other industries it goes without saying that much good can be done on the same lines in our coal mining communities. Some of you will be apt to say that the comparison is not well-taken and that there is as much difference between running a farm and a coal mine as there is between running a wheelbarrow and a linotype machine. However, I believe that you will all agree that the principles involved are similar in both cases.

Purpose of Welfare Work

This welfare movement goes under various names and is carried on in various forms, but it has one common purpose; that is to obtain the coöperation and good-will of the employees. If we hope for the movement to attain the fulfillment of its purpose the employee must receive just and honest treatment, he must be considered an essential factor for its success, and he must have some recourse for his real or imaginary grievances.

The success of the movement for the welfare of the coal miner does not depend so much on the owner, president or general manager as it depends upon the treatment of the employee by the local management. It is surprising what ill-feeling, bitterness and hatred can be created by an irate superintendent or mine foreman when dealing with his subordinates.

It cannot be expected that the employee will be loyal if he is abused and brow-beaten by his superior in office. We do not want to forget that the men in subordinate positions are human and should be treated as such and that an Italian, Greek, Jap or Negro, or any other man irrespective of nationality, color or creed, if worthy of being in the service in any capacity, is entitled to a civil answer and courteous treatment.

Under no circumstances or conditions has a superintendent or mine foreman the right to abuse or ill-treat an employee. The boss at all times has the right to advise, to censure and even to dismiss from the service men who have violated any law, rule or regulation whereby their own lives or those of their fellow-workmen are jeopardized. To the unemployed, as well as to the employed, the superintendent should be courteous and civil; especially should he be so to a man when he is seeking work. The sober, honest, industrious workingman is not seeking work from choice, but from necessity, and as such he deserves sympathy and a patient hearing. We ought to remember and practice the wise proverb, "A soft answer turneth away wrath, but grievous words stir up anger."

Clerks and weighbosses should be civil and courteous to all employees, as an offensive word from them is ofttimes far reaching in its evil effects. Our camp-store manager, as a rule, is a much-maligned man and he has an uphill job to counteract the prejudice against the company stores. However, he should at all times be civil and courteous to his patrons, not only for the sake of their patronage, but because of the evil influence any other course will have upon all employees.

Camp physicians should not only be attentive, but sympathetic, as a kind word in time of affliction goes a long way toward bringing about happy relations between employee and employer. I think that just, honest, kind and sympathetic treatment of the employees is the principal factor of success in any of our mining communities. Never has there been a truer saying than that made by the immortal Bobby Burns, "Man's inhumanity to man makes countless thousands mourn."

NEED OF DECENT SURROUNDINGS

The safety and sanitary conditions of our mines are not perfect, but considering the adverse geological conditions and the comparatively short period of experience in coal mining they will compare favorably with older countries. If we expect to gain the good-will and confidence of the employee we must provide for him healthy and sanitary conditions to work in and be ever careful and vigilant as to the protection of his life and limb.

I believe that the dwellings in our coal camps will bear favorable comparison with any of the coal-mining communities in any of the other states in the Union where the mines have been operated for the same length of time. In the early history of coal mining in Colorado, and I presume in all other states, the pioneers of the industry had to live in tents, adobes, dugouts or log cabins.

Colorado's climatic and topographical conditions are not very favorable, her populace are varied and transient, and water, the life-giving element, is scarce and difficult to obtain at any cost. In some of our coal camps, however, where conditions are favorable and where the life of the mine will justify the expenditure, I think it would be a good move to give our wives and daughters modern conveniences in the home. If pantries, clothes closets, screened doors and windows, water in the house, sewer connections, etc., are essential in other communities they are also essential in our coal-mining camps. I do not know of any people who are more deserving of such modern conveniences than the wives and daughters of our miners.

The bath-houses that have been built in our various coal camps have removed a great drudgery from our homes and are much appreciated by those who are favored with this modern convenience. Recently much attention has been given and much work has been done in fencing and arranging for lawns and gardens around the dwellings. The beautification of our environment will tend to draw into our communities a better class of workmen and will encourage thrift and individual responsibility. There is no doubt that the man who spends his time at the altar of Demon Rum or in absolute idleness when not at his regular work is not as good a citizen and not as desirable a workman as he who spends his spare time in his garden among his flowers or in otherwise improving his surroundings.

THE ADVANCE OF PROHIBITION

The use of alcoholic liquors and the toleration of saloons in our mining camps is a menace to their prosperity. I am glad to say that the days of the saloon in Colorado are numbered and that prohibition is gaining ground the world over. The Russian has given up his vodka, the Frenchman his absinthe, the Englishman has made the price of liquor prohibitive and the American Navy has abandoned the use of whisky; to cap the climax, Colorado has gone dry and placed in her statutes one of the strongest prohibition laws in existence.

With the removal of the saloon from our mining camps will come the necessity of providing suitable places for the relaxation of the mind and body of our coal miners. With this end in view, clubhouses, moving picture shows and playgrounds have been advocated. Some of the clubhouses are now in operation and others are in course of construction. Moving-picture shows are shown weekly in the southern field, and playgrounds for young and old are being made in many of our camps.

Probably a word of explanation on the clubhouse movement would not be amiss. The clubhouse is erected by the company and turned over to the employees free of rent. Light and fuel are furnished free. For the purpose of encouraging thrift and collective responsibility the management and control of the club are left entirely in the hands of the employees. The movement as yet is in the experimental stage, but it is the general opinion among employees that it will prove to be a success.

Moving-picture shows, if conducted on sound lines, can be made very instructive. It is the silent pedagogue of the age. The anti-fly, pure milk, anti-drunkenness and social justice films are the most powerful teachers in the country. The drama films encourage kindness, virtue and courage. The life of a miner at best is serious and solemn, so a good sprinkling of humorous films, like "Tillie's Punctured Romance," would be very agreeable in our coal camps, for a good hearty laugh is often much better for the human system than the doctor's pills. The moving-picture shows in our isolated mining camps are well patronized and are a source of good clean amusement.

EDUCATING THE CHILDREN

I have every reason to believe that the education of our children in the coal-mining camps is as efficient and thorough as it is in any other community, but I am inclined to believe that we have too many abstract themes and theories and that we are losing sight of the practical and applicable side of life. Education is an achievement, and to obtain it you must strive for it, and what is the use of our sons and daughters striving for education if it cannot be made helpful to their future existence.

What is the good of a workingman's son or daughter mastering geology, trigonometry or astronomy if he or she cannot make a living from it? Would it not be much better for our daughters to be taught how to make a palatable and wholesome layer cake than to be able to enumerate the sedimentary rocks in the Cretaceous period? Would it not be better for them to know of the hardy cereals and vegetables that will grow prolific in our arid lands than to be able to classify the flora of the Carboniferous era? Would it not be better for them to know how to mix and bake a baking of bread than to be able to take a theodolite out on the plains and calculate the altitude of Pike's Peak by trigonometry? It would be far more serviceable for them in future life to be able to trace a pattern over a piece of dress goods and know how to run a Singer sewing machine and make the lock and hem stitch so as to be able to make their own skirts and dresses than to be able to trace the elliptical orbit of Halley's comet in space.

I do not wish to be understood that our sons and daughters should be debarred from getting such special knowledge as I have mentioned; indeed, they should be encouraged to do so if they show any inclination or aptitude for such special knowledge, providing that their chances would be good in the future to make a living from what they had striven so hard to obtain. However, happy indeed is the possessor of the knowledge of the varied themes and theories that are taught in our schools, because a broad education makes us bigger and better and happier, and coal miners' children are as much entitled to these enjoyments as anyone else.

YOUNG PEOPLE'S ORGANIZATIONS

The Sunday School, Boy Scouts and Camp Fire Girls in connection with this welfare movement are deserving of more than a passing remark. They are the coming Americans. To them we must look for the permanency of the movement. Into them are imbued the physical, mental and moral qualities of mankind, and in years to come the result of their training will bear fruit.

The past legislature has aided the welfare movement by giving us the industrial commission and the compensation laws. It is too early to criticize or pass judgment as to the efficiency and equity of the said statutes. However, similar laws are in effect in other sections of the country and have proven to be effective in preventing industrial troubles and rendering aid to the needy in time of affliction.

A SOLUTION FOR MANY TROUBLES

Treat your employees honestly and justly; protect and safeguard them while at work; give them comfortable homes to live in; remove alcoholic liquors from our camps and give their children education on practical lines, and our miners, or the majority of them, will be contented and our homes will be havens of happiness. To the extent in which we succeed in this will we make our coal-mining communities immune from the ravages of industrial conflicts and their evil consequences. It is my firm belief that in the camps where this welfare work will attain the highest degree of perfection will be found the most desirable workmen and the best citizens, and the financial success or failure of operations will be measured accordingly.

It is not to be expected that we will ever attain to Tom Moore's utopian standard of conditions in or around our coal mines or that our coal miners and their families will ever be as happy as the flock herders of Arcadia, but much can be done to bring about such conditions so that all the powers of the Black Prince cannot sever the harmonious relations between the contented employee and the kind and honest employer.

In conclusion, I wish to say that nothing is too good for the honest, industrious coal miner and his family. I have confined these disconnected remarks on welfare of coal miners to the State of Colorado, and more particularly to the company that I have the honor to serve. I hope and trust that they will be accepted in the same spirit as I have written them and that they will aid in bringing about happier and closer relations between employee and employer.

[*The other papers, "Coal and Coal Fields of the Rocky Mountain Region," by Mr. Hills, and "The Use of Electric Lamps," by Mr. Thompson, will appear in "Coal Age" next week.—Editor.*]

Ballads of a Coal Miner--IV

The Wise Guy

Written Expressly for
Coal Age

By BERTON BRALEY

* * *

"YOU can't tell me nuthin'," the pitboss, he says;
"You can't tell me nuthin' a-tall,
I don't need advice from no hunkies like you—
An' if I do need it, I'll call;
I guess I kin tend to my business o.k.
Without no attention to nuthin' you say.

"You can't tell me nuthin'," the pitboss, he says;
"I reckon I'm on to my job,
An' I'll thank you to keep your suggestions to home,
You miser'ble ignorant slob;
I haven't no time fer to hear your idees;
I guess I'm the boss an' I'll do what I please."

Yes, that was the way that the pitboss come back
When I made a suggestion, polite,
But the Super he heard what the pitboss had said
An' he wasn't contented—not quite.
"Hold on there," he says, when the pitboss got through,
"I guess I'll horn in with brief word or two."

"They can't tell you nuthin'," the Super repeats,
"Then Lord help you, brother," says he,
"For the guy who imagines he's knowin' it all
Aint quite the right pittboss fer me.
If YOU can't learn nuthin' from no other man,
I'll go get a feller for pitboss who can.

"We haven't no use fer the feller," he says,
"That thinks he has knowledge to burn,
Who scorns all suggestions that comes from his men
An' won't never listen an' learn.
'They can't tell *you* nuthin'—them words makes me tired,
An' I'll tell you something right now—you are fired!"

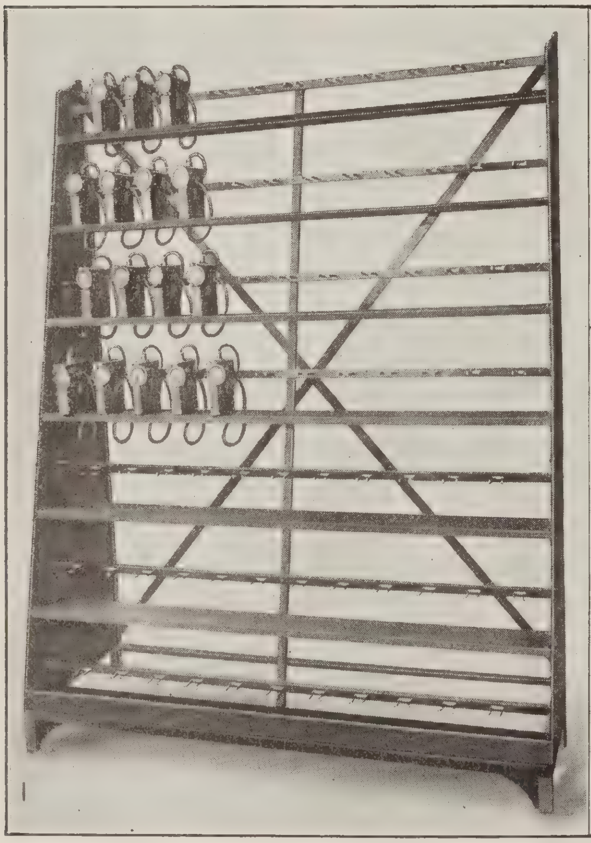
A New Electric Safety Lamp

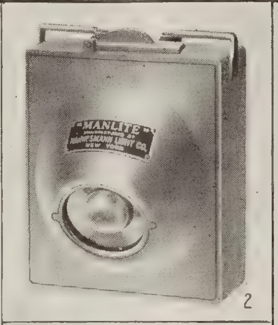
SYNOPSIS—A lamp based on the design which received first prize in a recent British competition has been entirely remodeled. It now not only appears as a cap lamp, but is much lighter than before. The manufacturers are willing to lease the lamps, agreeing in their contract to charge, clean and maintain them for every shift.

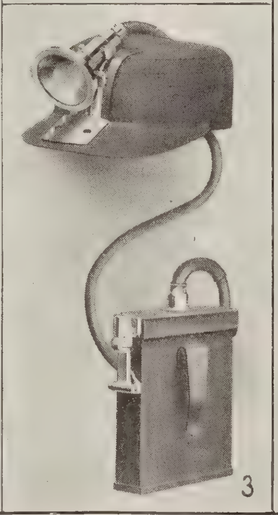
The United States Bureau of Mines has just awarded approval No. 11 to the Manlite electric safety mine light. This approval covers not only safety, but efficiency and practicability in general service. The lamp is manufactured by the firm which a few years ago introduced the Ceag electric safety hand lamp.

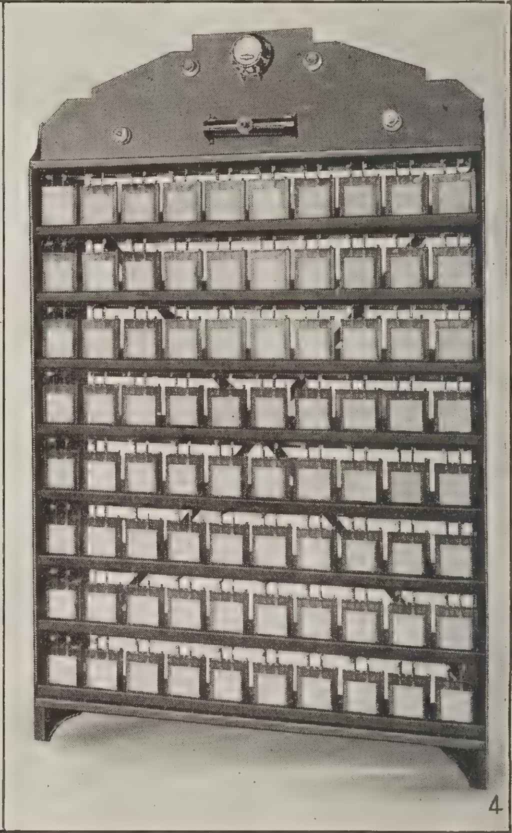
Improvement of Battery with Use

The lamp was approved only after passing exhaustive and severe tests in accordance with the exacting conditions which have been formulated by the engineers of the Bureau of Mines which are set forth in schedule 6A.









MANNESMANN MINE LIGHTING EQUIPMENT

Fig. 1. Lamp rack. Fig. 2—A lamp for use on a mule. It throws the light at the correct point on the track. Fig. 3—Lamp as worn on cap with battery for attachment to belt. Fig. 4—Charging rack

The lamp complete, including the battery, cable and head piece, weighs only 3½ lb.; of this the head piece weighs only 4 oz. The light is brilliant, but soft, and at the same time absolutely steady and unflickering for at least 12 hr. per single charge of battery. The curves of discharge of the latter on page 219 show how it improves in service.

On the first discharge the voltage falls to 1.8 in a little more than 8 hr. The second discharge reaches the same point in a little over half as long again. The progress is thereafter not so rapid, but by the twelfth discharge the voltage is maintained at over 1.8 for more than 15½ hours. By the thirty-seventh discharge that period is extended over the sixteenth hour.

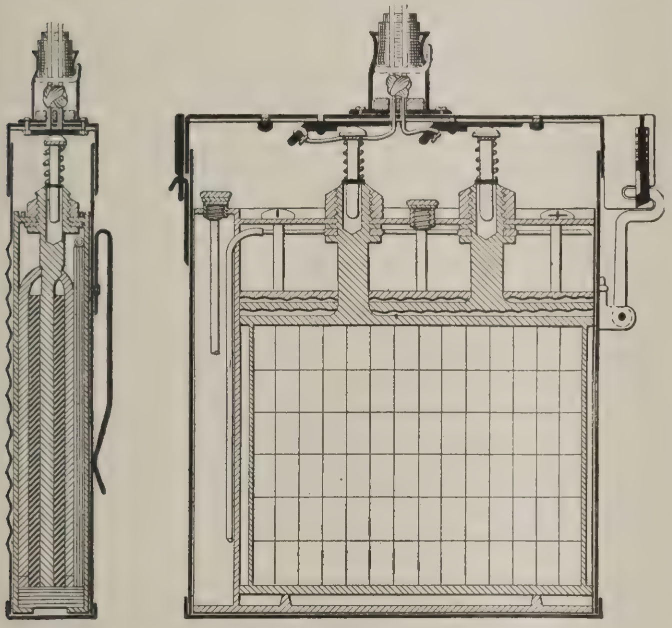
But these curves are based on a discharge of 1 amp., whereas the lamps only use 0.78 to 0.83 amp., and consequently the voltage is maintained for much longer periods than those mentioned. The curve of charge with 2 amp. on page 220 shows a slow increase in voltage till the fifth or sixth hour, when the rise becomes quite rapid till the seventh hour.

The batteries will supply light after 10 charges and discharges for 20 hr. at a stretch. This is not shown merely by laboratory observations and by deductions from curves, but by tests duly authenticated by mining companies which have used the outfits. This remarkable result is obtained despite the light weight of the battery.

The battery is of the lead-sulphuric acid type, the plates or electrodes being designed and constructed with a view to long life and dependable service. These plates are contained in a transparent case of remarkably tough and flexible material, which successfully withstood the dropping tests conducted by the Bureau of Mines under schedule 6A.

The use of a transparent container is a distinct advance in this type of accumulator construction, as it permits the attendant to observe at all times the condition of the electrodes, the quantity of precipitated sediment and the level of the electrolyte, all of which have an important bearing on the service rendered and on the life of the plates of any storage battery. No other electric mine cap-lamp battery on the American market possesses this highly desirable and important feature.

The container is also absolutely non-spillable, being fitted with a unique siphon device which prevents the spilling of the electrolyte irrespective of the position in which the battery may be placed. The battery container proper is carried in a case constructed of nickel-steel. It is of rigid construction and exceptional strength and is fitted with a self-contained magnetic lock which can only be opened in the lamphouse. Thus the miners are prevented from tampering with it. The entire battery and case is so convenient and light in weight that miners have declared that after a few hours' use they are not aware that they are carrying a battery on their belts.


CROSS-SECTION OF BATTERY WITHIN NICKEL-STEEL CASE

The conductor cable is of a special alloy of the highest conductivity and flexibility and is highly insulated. The cable is inclosed in a chrome-leather sleeve possessing great durability. The head piece, carrying the bulb, is unique in its simplicity and remarkable for its sturdy construction and extremely light weight. The shank of the head piece carries a safety device which absolutely prevents the ignition of explosive gases or mixtures even though the head piece be completely shattered.

The bulb employed, and approved by the Bureau of Mines, has a guaranteed life averaging 600 burning hours. It is held in the burning position by a perfectly ground crystal lens carried securely in place by the lens holder, the whole being sealed so that the miners cannot tamper with it.

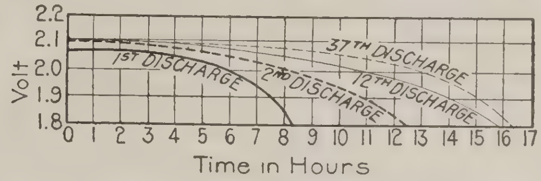
Miner Cannot Use Battery as Cigarette Lighter

There are no exposed terminals or parts of the entire equipment from which a spark or arc can be drawn, and the miner has access neither to the battery, conductor cable nor head piece and can extinguish the light only by breaking the lens. The outfit is therefore absolutely foolproof, as well as proof to dust and water.

The factors in this mine lamp which appeal to the practical mining man are safety, brilliancy and steadiness of light, simplicity of construction, economy in maintenance and adaptability to withstand rough usage. The equipment at the same time is no impediment to the miner when working.

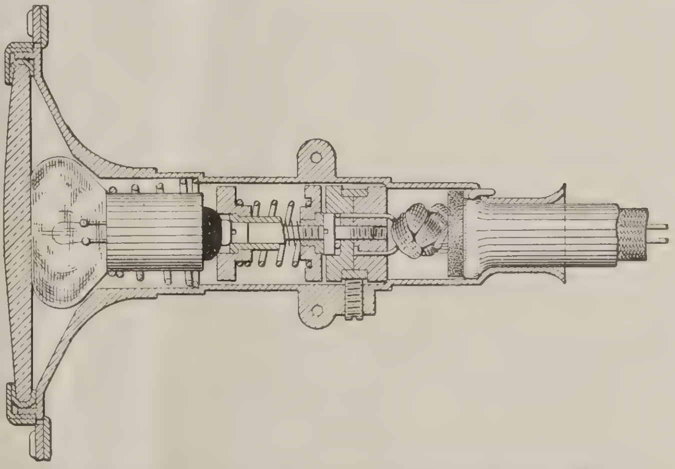
The fact that the lamp has been approved is a guarantee that it is absolutely safe even in the presence of explosive gas. The further fact that some thousand of these lamps have already been in continuous use for several months by the foremost mining companies is a convincing assurance that the lamp is efficient and practical in general service underground.

Accurate figures of the actual cost of upkeep of the lamp in continuous practical service for periods ranging from six months to over a year at various large mines have been collected. They prove that the cost of material per lamp shift does not exceed 1½c. In a lamphouse operating 320 of these lamps during five months past no battery repairs or renewals were required aside from a small quantity of electrolyte. The cost of other mechanical repair parts for the 320 lamps amounted to only $15.25. *Coal Age* is not allowed to publish these figures, but has inspected them, and they will be furnished by the manufacturer to anyone desirous of installing such equipment.



CURVES SHOWING HOW BATTERY MAINTAINS ITS VOLTAGE FOR A LENGTHENED PERIOD AFTER REPEATED USE

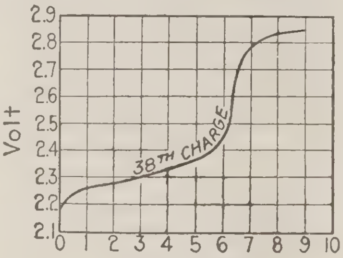
The equipment is sold at a reasonable figure, and the cost of renewal and repair parts is equally low in price; for instance, the cost of a positive plate approximates 50c., while a set of negative plates costs $1.


LAMP SHOWING THE DEVICES WHICH SHUT OFF CURRENT AND BREAK FILAMENT WHEN BULB IS BROKEN

Use in a Steeply Pitching Coal Bed

Among the mines using these lamps and presenting the greatest working difficulties is the Vulcan mine, of New Castle, Colo. operated by the Rocky Mountain Fuel Co., one of the most progressive operating companies of the West, which has had an extended experience in the use of electric mine lamps. The seam being worked at the Vulcan mine has an inclination of over 45 deg., but notwithstanding such adverse conditions, an equipment of these lamps in service for six months showed an average upkeep and repair cost of less than 20c. per lamp per month.

The service obtained with any electric miner's safety lamp depends entirely on the handling of the lamp and equipment. This has led the firm making the lamps to introduce a renting service. This saves the large expenditure of money involved where lamps are purchased outright. It also eliminates for the mining company the trouble of maintaining the lamps. When so rented the lamps and equipment remain the property of the manufacturer, who is bound by contract to deliver first-class lamp service, and also to furnish men to attend to the lamps. A suitable lamphouse, with hot and cold water and electric current, is furnished by the mine, and a small amount per lamp shift is paid as rental to the leasing company by the operating corporation. This system has given much satisfaction to the Keystone Coal and Coke Co., of Greensburg, Penn., among others. After a lamp cabin with a few hundred lamps had been operated by the manufacturer for this company for several months, at one of its mines, two additional mines of the same company were similarly equipped on a rental basis. The lamp is made by the Mannesmann Light Co., 329 Fourth Ave., New York City.



CHARGING CURVE OF MANLITE BATTERY

Electric safety lamps require the attention of trained electricians—reliable men who know all about the handling of accumulators. The Mannesmann Light Co. has a staff of such men who have been thoroughly trained in its own factory, and these men when running a lamp cabin will save money for the manufacturing company renting the lamps, thus enabling the rental to be put at what would otherwise be an unremunerative figure. There can be no doubt that the new method of renting will hasten the use of electric lamps in America and so advance safety in coal mines.

The Labor Situation

SYNOPSIS—John P. White declares that he does not desire a strike in the anthracite region and believes the men will secure adequate concessions without it.

The statement issued on July 27 by John P. White, president of the United Mine Workers of America, is so creditable to him and his organization that it is repeated in full:

"Articles appearing in certain newspapers during the past few days, for the most part published a great distance from the anthracite coal industry, which contain the information that the anthracite mine workers are making huge preparations for a big strike at the expiration of the present agreement Mar. 31, 1916, are absolutely unfounded.

"The campaign now being conducted in the anthracite region is for the sole purpose of uniting men of the mines as members of the United Mine Workers of America. When the anthracite miners have perfected their organization, I am of the belief that the union will be sufficiently strong and efficient to command the respect and recognition it deserves.

"I have every reason to feel assured that the operators, like the miners, want to be fair, and consequently I am at a loss to understand why the attempt in some quarters is being made to misrepresent the real purpose of our present membership campaign.

"Neither the International nor the district officials have formulated any plan that contemplates a strike at the expiration of the agreement. We are, on the other hand, hopeful that we will enjoy the opportunity to meet the operators in conference and reach a fair agreement embracing needed reforms and betterments that we feel quite confident the general condition of the industry will permit.

"The public should not become alarmed at the stories of a strike nature, for the mission of the United Mine Workers is one of peace, and I predict that such will be the outcome of our negotiations when we again meet the operators."

Central Labor Union Wants Help of Miners

On July 25 Steve McDonald, president of the Scranton Central Labor Council, made a strong plea before the convention of District No. 1 urging the miners to coöperate with other trades unionists in Scranton. So far the miners have never aided other labor interests by sympathy strikes nor have they been so aided, and the very nature of the contracts they seek to make would prohibit such action. To do as suggested would be to take a backward step.

But nevertheless McDonald would have them take it. "We should coöperate now," declared McDonald, "so that when the time comes to strike the enemies of humanity, it will not be necessary to appear before you to solidify your ranks." He urged that the strike of 1902 was won by the miners because the other labor elements had aided them and because financial assistance had been granted them throughout the country.

The speech of McDonald appeared to be a threat to make the strike in District No. 1 cover all the trades in that district and not merely a strike of miners, provided the latter and their employers could not come to an agreement. There seems to be a movement on foot to permit the Central Labor Council in the district to take up the disputes with the operators and decide them in place of the conciliation board.

The cry of labor solidarity always has a strong appeal, and it did not fail in this case, for the remarks of McDonald were loudly applauded. It is doubtful if the leaders of the miners are likely to be pleased, and it is extremely questionable if plasterers, masons, hodcarriers, carpenters and what not can help decide what miners should do, should concede and should demand. Clearly such an affiliation is another case of absenteeism; even the advocates of the miners are to be men who cannot tell a pick from a mattock. The miners have been storming at mine foremen who have never dug coal; now they are apparently willing to surrender leadership to men who never entered a shaft.

And yet like many other matters this would not be without advantage to the public, for the miners would then be restrained from too liberal demands by the interests of workmen who, engaged in other trades, look upon coal, not as a source of income, but as a large yearly drain on the family purse. However the workmen of the anthracite region realize that large wages paid by those outside the district are a source of prosperity to those within, and the solidarity might array all trades against the consumers both poor and rich in distant farms and cities.

Miners Seek To Keep Their Officials from Peculation

The union miners in District No. 1, having found that the peculations of their officers have caused defections to the Industrial Workers of the World, are determined to prevent them by bonding their local treasurers for twice the money handled at any one time and by securing the financial secretaries with a bond for $300. A resolution to that effect was passed by the convention. It is said that the Old Forge local union has lost $1200 by a defection of the treasurer, and many members are now followers of the I. W. W. in consequence.

The miners desire to get a compensation agent who can not only talk English, but Polish, Slavish, Italian, Russian and Hungarian, and who will issue the provisions of the act in those tongues. Linguists of such broad scope are in large demand everywhere and are not likely to be secured by the miners, but the demand for translations of the law are both feasible and to be applauded. In fact, the state might well undertake the work.

The Tridistrict convention in which will be represented all the union mine workers in the anthracite region, comprising districts 1, 7 and 9, will be held in Wilkes-Barre Sept. 7, according to a notice sent out by the district presidents and secretaries. This will prepare the demands to be made on the operators for a revision of the contract which will expire on Mar. 31, 1916.

Death of Frank A. Hill

This article was prepared for *Coal Age* by W. J. Richards, president of the Philadelphia & Reading Coal & Iron Co., and Baird Halberstadt, mining geologist, of Pottsville, both of whom were lifelong friends of Mr. Hill.—Editor.

Marked ability; wide experience in geology, mining and business; sound judgment, kindly frankness, absolute truthfulness; loyalty to his employers, his employees and his friends; devotion to his family; consideration of the feelings of others, and intense patriotism were the striking characteristics which made it possible for Frank A. Hill throughout his life to command the respect and esteem of all with whom he came in contact.

FRANK A. HILL

Mr. Hill, whose death occurred at twilight July 13, 1915, at Pottsville, Penn., was born at that place on Jan. 30, 1858. He was the son of the late Charles M. and Maria G. (Ayer) Hill. He came of a family that had long been connected with anthracite mining, his father having for many years been actively engaged as an operator and superintendent, operating the Oak Hill and other collieries in the southern anthracite field.

Frank A. Hill was educated in the private and public schools of Pottsville, graduating from the high school in 1875. Upon his graduation, he was appointed a chainman on the engineer corps of the Philadelphia & Reading Coal & Iron Co. under Gen. Henry Pleasants. With this company, he remained until the organization of the Second Geological Survey of the anthracite fields in 1881, when he was appointed as an assistant to Charles A. Ashburner, geologist in charge.

Mr. Hill's first geological work was in the Panther Creek district. Upon the organization of the other districts, he was assigned to the northern coal field in charge of the work, with headquarters in Wilkes-Barre, and later at Scranton. In 1885, he was transferred to the headquarters of the survey at Philadelphia, and the conduct of the work in the entire anthracite region was under his direction. In charge of this work, he remained until 1890, when he was made superintendent of the Dunbar Furnace Co., in Fayette County.

A short time after assuming charge of the furnaces and mines of the Dunbar Furnace Co., there occurred the disastrous fire at the Hill Farm mine, resulting in the death of 31 employees. Mr. Hill's heroic conduct in attempting to rescue these men alive called forth the highest praise, not only from the Government inspectors, but from the officials of the labor oganizations and the relatives of the entombed men.

Resigning his position at Dunbar in 1893, he was elected vice-president and general manager of the Southwest Virginia Improvement Co. With this company he remained until 1895, when he resigned to accept the office of general manager of the Hull Coal and Coke Co., with headquarters in Roanoke, Va. With this corporation he remained until 1908, resigning to become resident director of the mining interests of Madeira, Hill & Co., establishing his headquarters in Pottsville. It was this position he held at the time of his death.

In October, 1893, Mr. Hill was united in marriage with Alice Marie Müller, of Joliet, Ill. To this union were born three children—Frank, Marie and Alexandria, who with his widow and sister survive him.

The funeral services, held at his late residence upon Friday afternoon, July 16, were attended by prominent coal men from all parts of the Eastern United States. Interment was in a plot recently selected by himself in the Charles Baber Cemetery, at Pottsville.

In the death of Mr. Hill, the coal industry as well as his friends, whom he numbered by the thousands, has met with a severe loss.

The following editorial by H. I. Silliman, editor of the Pottsville *Journal,* shows the high esteem in which Mr. Hill was held by his fellow-townsmen.

"Frank A. Hill, whom God has seen fit to take from this community, was an unusual man—a man possessed of so much in high and splendid qualities that one felt honored by his friendship. He stood for so much in manhood; his manner was so gentle, but withal he was so virile that it is hard indeed to pen a proper appreciation of him.

"Frank A. Hill was a leader of men. He led them by the force of his dominating ability and his gentleness. He won the confidence of all men because there was something about him that seemed to speak out to you and say, 'Here is a man; mark him well.' He had no quarrels with the world; if he could not speak well of a man he did not speak ill of him. He was always arrayed, in all the strength of his fine manhood and courage, against that which was base and ignoble; he upheld with his voice, his talent and his means all things that tended to uplift and make better.

"Mr. Hill was a graduate of the Pottsville high school which has been dubbed 'the College of Mining Managers' because it is the only 'college' that the manager of nearly all the big anthracite coal companies ever knew. Of all the strong men this splendid institution has given to the world there is none that has reflected more credit upon it than Frank A. Hill."

Editorials

Colorado School of Mines To Honor Dr. Holmes

The editorial in *Coal Age* last week entitled "A Memorial for Dr. Holmes" has brought forth numerous suggestions indicating the high esteem in which Dr. Holmes was held by the mining fraternity. The following telegram is interesting and will meet with the warm approval of the friends of the late director of the United States Bureau of Mines:

> Referring to your editorial of July 31 concerning a memorial for Dr. Holmes, desire to say that the Board of Trustees of the Colorado State School of Mines will take action Aug. 12 on the establishment of the Joseph A. Holmes Professorship of Safety Engineering in honor of the man who did so much for the welfare of mining and metallurgical interests in this country. We feel here in Colorado that we could not provide a more fitting memorial to his memory. WILLIAM B. PHILLIPS, President Colorado State School of Mines.

Coal Age wishes to congratulate the School of Mines on this fine show of appreciation for the faithful and efficient labors of a loyal and respected man, who stood for the highest ideals in the science of mining.

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A 40,000,000-Ton Annual Cut in British Exports

By far the most significant development in the export trade since the inception of the European War is the cable report just at hand to the effect that Great Britain has placed a rigid embargo against all exports, including those to her allies and excepting only British possessions and protectorates. In view of the turmoil prevailing in the coal fields of England, which has attained to more serious proportions than is perhaps generally known, this new regulation was not entirely unexpected by well-informed observers who have been closely following the trend of conditions.

Computed on the basis of the June exports for the current year, the order will mean the withdrawal of 3,561,650 tons of British coal per month from the world's markets. This figure may be assumed as a conservative estimate since the new conditions developed by the war may now be considered as fairly representative. During June Great Britain exported 3,725,423 tons. If we interpret correctly the meaning of this new regulation, the possessions which may still receive coal exports from England took only 163,773 tons during June. These include Gibraltar, Malta, Egypt, including Anglo-Egyptian Sudan and Aden with her dependencies. In normal times Egypt alone absorbs more than 200,000 tons per month of British coal, whereas this is now down to only about 65,000 tons, so that it will be seen this estimate takes into full account the present war conditions. Assuming this to be a typical month, this means a shortage in the foreign markets aggregating more than 42,000,000 tons per annum.

In the midst of all the excitement and flurry accompanying the reports of a tremendous expansion in our coal-export trade, it is well to remember that we have, on the contrary, suffered a sharp decline in our export shipments. It is true that there has been an unprecedented movement in new directions, as for instance to Italy, which has taken 1,250,000 tons during the past 11 months, as compared with practically nothing previous to this time. On the other hand, this gain has been more than wiped out by a decline of more than 3,000,000 tons, which we have lost in the bituminous exports to Canada during the past year.

Our gross exports for the 11 months ending May of the current year are 12,500,000 tons, as compared with 14,500,000 for the same period last year, showing a direct loss of 2,000,000 tons covering what is essentially the war period.

Turning again to the new regulations regarding the British exports, it is interesting to note that the tonnage she is withdrawing from the world's coal markets amounts to approximately three times our normal exports. In view of the fact that we are the only large producing country which can be drawn upon to make up this enormous deficiency, these figures are certainly significant. Lack of adequate shipping facilities and also probably insufficient loading capacity at our piers make it inconceivable that we would at any time in the immediate future be able to triple our exports, but there can be little doubt that we are now on the eve of a new era in the export trade.

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To the Unsuccessful

This is written to the unsuccessful not because others will not be interested but because the fellow down on his luck will best understand it. It is certain it will not please him as much as it will others, but, then, nothing should be written merely to please. An attempt, at least, should be made to inform.

Some years ago you married, bought some furniture and began to raise a family. You had ambitions and hoped that after a few years of hard work, care, thrift and saving you would have a nice little bank account. But it didn't go that way. An insurance policy was taken out, but times got so bad you borrowed money on it, and year after year you had to pay interest on the loan, which had a way of increasing with frequency.

The furniture was new when you were married, but time has passed and the neighbors would not now take it even as a gift. The outlook is gloomy in the extreme. You had promised yourself to make each year pay for itself, yet every year since then seems to have been a clear debit; yet your income has not decreased. If anything, it is larger than it was. Now to add to your troubles there are more mouths to feed and you are getting old and beginning to fail as the years increase.

If all the people in the United States made a similar showing to yours—passed from year to year with their depreciations unreplaced, with their borrowings increased, where would the country end? And yet there are people, who are fair and honest in their dealings, who would like every dollar to go in wages and not a cent in profits or repairs, so much do they object to capital. They forget that the country is growing older and less fertile and less full of resources and is daily increasing its population. They forget its comforts must decline if for more people there is less substance.

Such people would bring Uncle Sam to the same unfortunate condition you are in. But if you could make a 50 per cent. saving and Uncle Sam could put 50 per cent. into profitable development, such as the Panama Canal, railroad lines, permanent roads and good houses for workingmen, and the other 50 per cent. into satisfying his immediate needs, how you and he could progress from comfort to comfort!

It is clear that profits are the hope of any nation, just as profits or savings are the sheet anchor of any individual. There is no doubt that there should be a big profit—that is, large savings. The only reasonable difference between economists is whether that profit should be private or public—that is, whether we should have private ownership or socialism. We cannot doubt but that the chisel of labor must be made effective with the hammer blows of capital; but just what form that hammer shall take is uncertain, even though we are sure that the chisel alone would be ineffective.

Asquith and Lloyd George have been urging the British people to save; but there is little hope that they will economize. For war times stir the mind and excited men spend like gamblers. There is no resource except in profits if Great Britain expects to lay aside $5,000,000,000 out of earnings. Perhaps it was because it remembered this that the government has been so loath to forbid large dividends. Only such a source of revenue as accumulated profits can prevent the country from becoming a debtor to nations that, being free of war, have money to lend. It is not likely that any appeal will make the British save, any more than such an admonition would make us thrifty in this country. Enforced temperance might accomplish something; but even that is doubtful.

It is a fact that a large percentage of British workmen now spend more than they receive as wages, for they are recipients of free education and of mothers' and old-age pensions partly provided by the state, which in Great Britain secures its funds mainly out of the profits of capital. It is also true, of course, that a large number have much money expended on them in dispensaries and relief organizations. If it were not for profits these pensions and assistances could not be provided. The men mentioned may not be larger consumers than producers of wealth, though many of them are, but it is only the profits of the manufacturer which prevent this being a fact. Even if these profits were divided among the producers, the small sum thus provided would be immediately spent.

The world will never grow, and it never has grown, except by dint of large profits. The problem to be met, and met soon, is how they may be distributed. Anyone who knows how the future is hampered by the policy of doing business on the meagerest of returns will realize that it is the nation's business to see that the investment both in capital and in labor is laying by a profit and amortizing its losses.

But it must be remembered that the economic problem of national advancement opposes, face to face, the question of moral health. Great wealth in the hands of individuals has corrupted many peoples and demoralized those who had it as well as those who had it not. It has been hard for the millionaire to be a man, and the attainment of real manliness is almost, if not equally, as hard for his employee, for the rich man tends to corrupt his poorer neighbor.

These remarks do not attempt finality. The problems at present seem to elude settlement, so the thoughts here expressed may be somewhat slangily ended with the colloquialism, "What's the answer?"

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The Value of Safety First

The Madison Coal Corporation has had much success in its safety propaganda and in insuring its miners against injury. It has always carried its own insurance fund.

But there should be some hesitation in taking the success in safety propaganda and auto-insurance of A. J. Moorshead, president and general manager of the Madison Coal Corporation, as an example, for those who know Mr. Moorshead's ability in dealing with men will realize that his success might well be due to the man and not the methods. Two men do the same thing, follow an identical course and an extremely different result is obtained, for one man is magnetic and the other cold and dictatorial. One man leads and the other man seems merely to organize opposition.

But whether Mr. Moorshead or his methods are to be credited, he has been quite fortunate in reducing his accidents and settling his labor claims. It must be admitted that so far he has had no major accident. Still it is worthy of notice that in 13 years he has had 60 damage suits and has won them all, which shows that he has been disposed to settle every reasonable claim.

He has carried his liability for 0.6446c. per dollar of payroll and in addition to paying all expenses has accumulated out of that charge a liability insurance fund of $38,000. Deducting this surplus, the cost of accidents to the company has been only 0.4664c. per dollar of roll. The higher figure, 0.6446c. per dollar, is less than one-third of the best mutual rate and less than one-sixth of what a good stock company would demand.

We fear to offer for commendation a small feature of Mr. Moorshead's campaign because there is always the risk that someone will think it is alleged to be the main source of his freedom from accident, which would of course be absurd. Nor is the idea advanced as new. It has been used before in a slightly different form by the Susquehanna Coal Co. and perhaps others, and as far as can be discovered not without success.

The Madison Coal Corporation puts into the pay envelopes slips of paper of a different color each time with mottoes or warnings printed thereon. Such mottoes are: "Be sure the roof is in safe condition before commencing work." "Use care and avoid injuries." "Be careful all the time—and you won't be sorry afterward." "Someone's carelessness is the cause of every accident; don't be the one." "Better be safe and sure than crippled and poor." "Do not take chances; look—think—listen—before you act." "Where caution ceases danger begins." "The chance-taker is the accident-maker." "Is it safe? Be sure." And then finally an admonition of another sort, "Use as little powder as you can; it will save you money and give the company a better grade of coal."

It must be said that fortune does not unduly favor the Madison Coal Corporation. It operates the No. 6 seam in which statistics show that more fatalities per ton occur than in any other machine-mined bed in Illinois.

Sociological Department

Victor-American Fuel Co.'s First-Aid Contest

By Tracy Garrett*

SYNOPSIS—The writer gives a careful criticism of the first-aid work of the various teams contesting for first place in the contest of the New Mexico division of the Victor-American Fuel Co. The Heaton team used cadgers of carbide to warm those who were suffering from shock.

First-aid teams representing the Heaton and the Weaver mines tied for first place in the annual first-aid contest of the New Mexico division of the Victor-American Fuel Co. held at the company's athletic park, Gibson, N. M., June 13. The handsome silver loving cup presented by the fuel company for these contests was finally awarded to the Heaton team. The Weaver first-aid corps, which has held the trophy since the last previous contest, gracefully relinquished its possession, but is determined to bring it back across the hills next year. The Navajo mine entered two teams, one from each opening. Navajo No. 2 finished third and Navajo No. 1 fourth.

This year's contest was pronounced by all the most successful that has been held. The interest in the rivalry was general, and the large amphitheater was well filled with spectators. The judging was done by Dr. A. H. Schermann, of the Diamond Coal Co., Allison, N. M., and James Yates and Tracy Garrett, division officials of the Victor-American Fuel Company.

At the conclusion of the contest the judges declared that the work of every team taking part was far above the average, the poorest being sufficient for all practical purposes, and that most of the deductions made against any team were for minor omissions, in the case of the Heaton team being for failure to complete one event within the specified time limit. Dr. Schermann, who had never before seen any of these teams work, remarked particularly upon the efficiency shown and the practical character of all the work.

HEATON TEAM, WHICH RECEIVED TROPHY AT THE ANNUAL FIRST-AID CONTEST OF THE NEW MEXICO DIVISION OF THE VICTOR-AMERICAN FUEL CO.

From left to right standing, J. E. Ambrose, superintendent; A. Browning, J. Jackson, J. Peckand, R. Dennard; kneeling, A. Jackson and R. Sneddon

For the contest, two rows of mine props were set 8 ft. apart, at 10-ft. intervals for a length of 125 ft. Strips were nailed from top to top of opposing posts, 6 ft. above the ground, and ropes were stretched along the sides, connecting the tops of the posts. These bounds were placed to simulate an entry in a mine. In one place props to represent a fall were piled half way up to the cross-strips mentioned, and at another a low place, 4 ft. high, was arranged. The fuel company's ambulance was also on the grounds, and each team furnished its own first-aid material, the judges passing upon what could legitimately be used as such.

CONTESTING TEAMS WITH THEIR PATIENTS SPLINTED FOR THE SUPPORT OF A BROKEN BACK

Carbide Cadgers for Heat in Case of Shock

The two teams representing Navajo and the Weaver team made use of safety lamps for applying heat in treating for shock, but the Heaton team used carbide cadgers, warming these by moistening the carbide which they contained.

Specifications for ten events were placed in envelopes, and the judges drew out five shortly before the contest started, so that no team or instructor would know in advance what events would be called.

The first event was the rescue of a man overcome by gas in a low place. He had become unconscious and must be dragged 10 ft. to a higher place and carried 50 ft. to good air. At that point artificial respiration was administered for one minute. The time allowed was 6 min. The Weaver and Navajo teams were each penalized in this event for failure to treat for shock before leaving the patient. Aside from this, the work in this event was particularly good.

Robert Dennard, captain of the Heaton team, besides using his safety lamp to test for inflammable gas before entering the place where the victim was lying, used a canary bird to test for carbon monoxide. It was the first time a bird had been introduced in a first-aid contest in this section, and while no extra credit was allowed for its use, it was an interesting feature and secured the applause of the spectators.

The second event was for full teams, and a simple fracture of the right thigh was treated. The victim was put on a stretcher, carried 50 ft., lifted over an obstacle and put into the ambulance. The time allowed was 10 min. The Heaton team took 11 min. and 20 sec. to complete the event and was accordingly penalized, but in every other way its work was of a high order. The Weaver team finished this event with a perfect score, coming well within the time limit, yet working deliberately, carefully and handling the patient in a most creditable manner. Navajo No. 1 was penalized for failure to sound the roof before taking the patient over the fall and because the captain did not handle the team properly.

The third event was the bandaging of a victim whose back was broken. The contestants improvised a stretcher and carried him 50 ft. All teams constructed their stretchers with the aid of jumpers, drills and bars. The time allowed was 10 min., and although the long back splints had to be assembled and padded, all teams came well within the time limit. The Navajo No. 1 team was penalized in this event for failure to do the most important thing first, a stretcher being made before the patient was treated and made as comfortable as possible. At the conclusion of the event and after the judges had carefully inspected the bandaging, they required each team to raise its patient to make sure that the splints were so securely bound that the man could not slip.

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*Assistant general superintendent, Victor-American Fuel Co., Gibson, N. M.

The fourth event was the bandaging of simple fractures of the left humerus and right kneecap. The victim when treated was put on a stretcher. The time allowance was 8 min. All teams completed their work well within the limit and with excellent results. The chief deduction in this event was against Navajo No. 2 for putting the lower bandage too far from the injured kneecap.

The fifth event was the bandaging of a simple fracture of the right leg below the knee and a simple fracture of the lower jaw. After treatment the victim was put on a stretcher, the time allowance being 8 min. All the teams bandaged the head in a satisfactory manner, but Navajo No. 1 handled its stretcher with insufficient care.

Triangular Bandages Those Most Used

Under the rules either the triangular or roller bandage could be used, but the former was the more popular. In the last event, however, the Heaton team used a roller bandage in treating for simple fracture of the leg and did a particularly neat job although no additional credit could be allowed for it. The work of the Weaver team in applying triangular bandages to the patient's broken jaw occasioned favorable comment from the judges, as did the rapid and efficient work of Navajo No. 2. The work of Navajo No. 1 was rougher and not so well finished as that of the other teams, but in a practical test with underground conditions there is no doubt this team would show particularly well.

First-Aid Contest in Virginia

By G. B. Southward*

The First Annual First-Aid Field Contest of the southwest Virginia coal field was held at Big Stone Gap, Va., on July 2, 1915. The contest was under the auspices of the American Red Cross and the American Mine Safety Association and under the direction of Maj. R. U. Patterson, chief of the First-Aid Department of the American Red Cross, assisted by Dr. W. J. Shields of the same organization. In connection with the contest a mine explosion was demonstrated under the direction of E. B. Sutton, district engineer of the United States Bureau of Mines. The demonstration was given in a wooden gallery 85 ft. long, coal dust on shelves in the gallery being exploded by a cannon placed at one end.

LAUREL TEAM OF THE CLINCHFIELD COAL CORPORATION

Seventeen teams of white miners, representing the Clinchfield Coal Corporation, the Virginia Iron, Coal & Coke Co. and the Stonega Coke & Coal Co., were entered in the main contest. In addition to these, there were three colored teams of the Stonega Coke & Coal Co., who competed for a separate prize, and a boy-scout team of Stonega, Va., who gave an exhibition drill. The contest was witnessed by about 2000 spectators.

The contestants, headed by the Roda Band, marched onto the athletic field and took their stations in a continuous line

A DEMONSTRATION OF A COAL-DUST EXPLOSION IN THE WOOD GALLERY AT BIG STONE GAP, VA.

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*Assistant engineer, Stonega Coke & Coal Co., Big Stone Gap, Va.

in front of the grand stand at 1: 30 p.m. About 20 min. was allowed for the teams to make their preliminary arrangements, during which time a test was made in the gallery, permissible powder being used in the cannon. No explosion of the dust resulted.

Five problems were given, including one-man, two-man and full-team events. Five-minute intervals were allowed between numbers; but the contest lasted a little less than one hour. Immediately following the last event a second explosion test was made, the cannon being charged this time with black powder instead of permissible powder. A severe explosion of the coal dust resulted, forming a cloud of smoke and flame at the end of the gallery which rose to a height of over 50 ft. After the explosion the scores were read and prizes valued at $300 were distributed by Major Patterson to the twelve teams having the highest scores in the full-team events. Ten prizes were given for the one-man and two-man events.

The winners of the first three prizes for full-team scores and the best teams in the one-man and two-man events were as follows:

First full-team prize: Won by the Laurel team of the Clinchfield Coal Corporation; consisting of the Westinghouse three-year silver loving cup, the Provident silver loving cup, American Red Cross medals and certificates, American Mine Safety Association medals and $40 in cash. Score, 93 per cent.

Second full-team prize: Won by the Inman team of the Virginia Iron Coal & Coke Co.; consisting of American Red Cross medals and certificates and $35 in cash. Score, 90.2 per cent.

Third full-team prize: Won by the Keokee team of the Stonega Coke & Coal Co.; consisting of American Red Cross medals and certificates and $25 in cash. Score, 90 per cent.

First prize one-man event: Won by J. J. Strong of the Imboden team of the Stonega Coke & Coal Co.; consisting of a gold watch and chain and American Red Cross medals and certificates. Score, 98 per cent.

First prize two-man event: Won by A. H. Hurd and Clarence Aldridge of the Keokee team of the Stonega Coke and Coal Co.; prize consisting of American Red Cross medals and certificates, a thermos carafe and an electric chafing dish. Score, 95 per cent.

Meeting of Superintendents of Utah Fuel Co.

At the June meeting of the superintendents of the Utah Fuel Co. held at Winter Quarters 18 men of various official capacities discussed the subject, "Standardization of Material and Methods."

Before supper the visitors were taken into the mine and shown some of the first-aid stations, situated conveniently to the centers of greatest activity. These stations are built of concrete, generally in cross-cuts, and all the walls and approaches are whitewashed. These offices are kept warm and dry by electricity. They are equipped with a complete assortment of first-aid appliances and supplied with water.

After supper all attended a meeting of the Winter Quarters' First-Aid Society, held in the auditorium of the newly erected amusement hall. The report of the society for 1914 mentioned that members had rendered first aid in a large proportion of the accidents which had occurred in and around the mine, had rendered financial aid to unfortunates in the community and had sent money for the relief of the European war victims, in all a most commendable showing.

At the superintendents' meeting it was decided that as the study of "Standardization of Material and Methods" as applied to coal mining embraced such a wide variety of subjects no one man could handle it fully. Consequently each man was asked to "ride his hobby" for the benefit of the others. From the variety of subjects introduced, those which held the most promise for immediate improvement were selected and discussed in detail at once. The others were considered as occasion permitted during the progress of the meeting.

SUGGESTIONS FOR STANDARDIZING MINE MATERIAL

To report all the remarks of the 18 persons present would take too much space, so only a few of the points made will be mentioned. The suggestion was presented that a central warehouse or store be provided which would be stocked with standard supplies. It was shown that these articles could then be bought in such large quantities as to effect a saving in cost. From this storehouse all the mines could draw. It was shown that between 30 and 50 per cent. could be saved on first cost by buying some materials in large quantities, and that by adopting standards the money invested in repair parts could be greatly reduced. Moreover, using standard articles caused an indirect saving, because camps, in case of accident, could be supplied from each other.

To descend to detail, by buying in quantity and standardizing the use of lubricating oils large savings were possible. By using good material of standard sizes much saving could be made in mine props and ties. Good props properly placed would hold the roof weight better, permit greater recovery of pillars, and a large percentage of the props could be recovered and used again.

Similarly, inferior ties, even though much cheaper in first cost, were in the long run poor economy, for they did not make good tracks, as the spikes driven in them did not hold well and derailments were many. The ties did not last long and could not be used again. It was also important to have the right weight of rails and standard shapes, so that certain sizes of fish plates, bolts and track bonds could be used throughout the mines.

While it was generally agreed that many materials could be purchased to conform to a standard, the standardization of machinery presented many difficulties. Machinery is bought as necessity requires, and sometimes long periods of time elapse between purchases. During this time many improvements may have been made in the apparatus required. Such improvements may not, however, justify the expense of new equipment throughout, yet it might be obvious that it would not pay to duplicate the old, which time had already rendered absolete.

BRINGING FOOD TO A STANDARD

The local doctor lent interest to the meeting by suggesting the need of standardizing foods, especially milk and meat. The need of a clean, wholesome milk supply is apparent to those who come in contact with the children of a camp. Good milk is difficult to obtain. The amount of freshly killed meat, especially goat meat, that is peddled around the camps is large and its bad effect on the health of some of the foreigners is marked. The doctor said these subjects were important economically because the efficiency of the workman depended largely on his receiving proper nourishment. A well-nourished man makes the most efficient laborer, while one who lacks such support often "hits the booze."

Methods are much harder to standardize than materials, and much study is needed before they can be standardized. It was the sense of the meeting that each division of the subject be made a special study by men who were versed in it and that their recommendations be made the base on which the future standards will be prepared.

Discussion by Readers

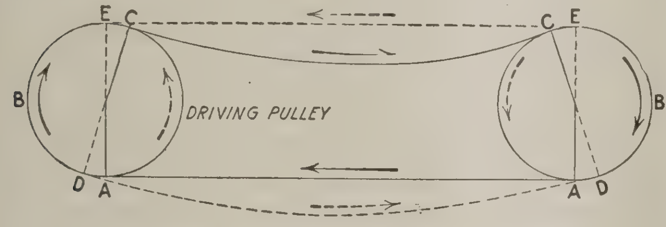
Mining Machinery--Belting

Letter No. 1—It has been suggested that much good can be derived from the discussion of the many practical points relating to mining machinery and equipment. One point that occurs to me, and which may prove interesting to others, is the adjustment, lacing and care of belts used for driving mine fans, pumps and other machinery.

Having spent much time in and about coal mines, I have observed that, as a rule, belts are not always used to the best advantage, and I offer the following suggestions that may be useful to the man who has belt trouble.

Except in the case of small belts driving light machinery, it is better to use a belt a little longer than necessary. In order to transmit the required power, the belt must exert a certain pressure on the pulley. In the use of a small belt this can only be obtained by stretching the belt tight. Such belts will generally be required to be tightened again, from time to time. A heavier belt, made somewhat longer than necessary, so that it operates with considerable slack, will give better results and require less attention than a tight belt.

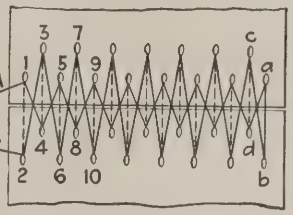
There is an advantage in running a belt as nearly horizontal as possible, and whenever practicable the direction of rotation of the driving pulley should be such that the pull will be exerted on the lower side of the belt. As shown by the full lines in the accompanying figure, when the pull is on the lower side the upper side of the belt, in sagging, increases the arc of contact on both pulleys and gives greater force to the belt by decreasing its tendency to slip on the pulley. On the other hand, if the pull is exerted on the upper side of the belt, the sag of the lower side will decrease the arc of contact to the same extent that it was increased by the previous arrangement, as shown by the dotted lines in the figure. In the former case, the arc of contact on both pulleys is *ABC*, while in the latter case it is only *DBE*. The arrows indicate the direction in which the belt runs in each case.



PROPER AND IMPROPER BELT-DRIVE

It is generally better to have the belt made up endless, especially for a high speed; otherwise, lacing will be necessary, and this must be properly executed. To lace a belt, two rows of holes must be punched in each end of the belt, these holes being staggered so as not to be opposite each other in any two adjacent rows. In order to reduce the tendency of the holes to tear out, an oval punch should be used. The edge of the first row of holes must not be closer than ¾ in. from the end of the belt, and the two rows of holes should be about 1 in. apart, center to center. Practically, the same distance must be preserved between the edges of the outer holes and the edges of the belt.

A good form of lacing is shown in Fig. 2. Starting at the left side of the belt, the lace *A* is entered the hole marked 1 from the upper side of the belt and carried underneath to the hole marked 2, as indicated by the dotted lines. It is then passed through hole 2 and carried on the upper side of the belt to the third hole, and thence on the under side to the fourth hole. In this manner the lacing is carried across the entire width of the belt. On arriving at the right side of the belt, the lace is passed through hole *a* and back through hole *b* twice, after which it is carried on the upper side of the belt to hole *c* and underneath to hole *d*. In the same manner the lacing is carried to the left side of the belt where the end *B* of the lace emerges from hole 2 on the upper side. The two ends *A* and *B* are then securely tied together on the upper side of the belt.



SHOWING GOOD METHOD OF LACING A BELT

There is thus formed on the under side of the belt a double lace passing from hole to hole in straight lines parallel to the length of the belt. There must be no crossing of the laces on the under side of the belt. The hair side of the belt should always be run next to the pulley, as being smoother it gives more perfect contact with the face of the pulley. No oil should be allowed to come in contact with rubber belting, but should there be any oil on the belt, it can be removed with turpentine. Only tallow or castor oil should be used on leather belting, and this but sparingly.

CHIEF ELECTRICIAN.

Logan, W. Va.

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Stopping Payroll Leaks

Letter No. 6—In connection with the interesting letters on "Stopping Payroll Leaks," it occurs to me that many small pick mines, employing mule haulage and managed by competent mine foremen, will often put coal on the tipple much cheaper than some larger mines employing electric-haulage motors and cutting machines. There are no doubt several reasons for the higher cost of production at these larger mines; but I believe the most important factor in increasing the cost of operation is the upkeep of the electrical equipment of the mine, especially the bonding of the rails. Attention was drawn in Letter No. 3, May 22, p. 901, to a serious leakage of the electric current owing to the poor installation of the trolley-wire hangers inserted in the roof of the entry and causing a loss of hundreds of dollars a month.

I have been chief electrician and master mechanic for different coal companies for a long time, and in every instance but one the mine foreman had charge of the bonding of the rails on the main-haulage road. Among all these foremen I only recall one who realized or cared to realize the importance of good bonding. In some cases this work was entirely neglected with the idea of avoiding "unnecessary expense underground." The foreman, if he knew, entirely ignored the fact that this saving of expense underground was the direct cause of a much heavier expense in the power house, due to the burning out of armatures, field coils and controllers, for which the mine electrician would be responsible, in his opinion. It is needless to remark that under these conditions the company could have saved at least the electrician's salary, by giving the mine foreman charge of the entire equipment, since no expert knowledge is required to replace an injured part with a duplicate piece.

Only recently I accepted a position as chief electrician with a company operating several mines. Each mine was in charge of a mine boss, having a mine mechanic under him. Because of troubles in the electrical equipment, resulting in a high cost of production, the mine manager decided to employ a chief electrician, and I was selected for that place. Owing, however, to the fear of producing friction underground, the mine foreman still had charge of the rail bonding in the mine. It soon developed that the mine foreman of one of these mines was getting better results when he broke all past records by putting his coal on the tipple at a minimum cost.

It appeared, also, that the miners working in that mine were always satisfied and contented. They knew that when they reported for work in the morning they would not be sent home because of a breakdown of a haulage motor, cutting machine or other portion of the equipment. The foreman of this mine was a competent man, who always put the company's interest foremost and gave close attention to every mechanical detail underground, including the bonding of the rails.

In strong contrast with this favorable condition there was considerable trouble in the adjoining mines where the foremen did not give the same close attention to the smaller details of the mine equipment. The bonding of the rails was thought to be almost useless, and little effort was made to keep it in order. Starting from the mine entrance, one could find many joints too hot to bear the hand. In one case the foreman remarked that the bonding on the main road he thought was good, but he did not intend to give any attention to the bonding of headings where machines were cutting, as he thought it was unnecessary.

At another time a voltmeter gave a reading of only 180 volts on a 250-volt circuit, at a point 6000 ft. from the entrance to the mine. There were three gathering motors at work inby from this point, while a 10-ton motor was employed to haul the loaded trips to the tipple. When the motor on the main road started to haul its trip to the surface, the pressure would drop to 80 volts and remain so for five or eight minutes. During that time the small gathering motors could not move.

In this mine the trolley wire on the gathering haul was in such bad shape that the mortormen did not attempt to use the trolley poles, preferring to operate their motors with the cable from the gathering reel. Since there were in all ten gathering motors in this mine doing the same thing, it can well be imagined that this was an expensive proposition for the company, resulting frequently in the burning out of armatures and controllers and causing other troubles. The cutting machines had to work with such low voltage that it took but a short time to burn out the fuses and armatures on those machines, making the expense for maintenance shamefully high and causing much unpleasantness for all concerned.

In my opinion, with proper bonding alone in this mine, the cost of putting the coal on the tipple would have been 10 or 11c. per car less, or about 4c. per ton less than under the prevailing conditions. Assuming the mine ran only 20 days in the month, this would mean a saving of $800 a month.

The trouble to which I have referred is a common one, and the instances cited show the saving that could be effected by employing a competent electrician and giving him charge of the entire electrical equipment, both on the surface and underground. It is manifestly unfair to hold an electrician responsible for results that are due to another man's neglect. It does not appear to me that there is any cause for friction when the bonding of the rails is in charge of a competent electrician, instead of being left to the mine foreman to look after, who is not particularly concerned in the trouble his neglect causes in the power house, and elsewhere, for which he will not be directly to blame, according to his reasoning.

Successful operation demands that all mine work be classified and a competent man be placed in charge of each kind of work for which he is particularly fitted, and made responsible. To obtain competent men, I believe examinations should be held, covering each class of work, and certificates of competency given to candidates who pass a successful examination.

C. J. Fuetter.

Millwood, Penn.

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Success in First-Aid Work

In passing judgement on events that have taken place, different individuals arrive at different conclusions because they view the events from different standpoints or angles. I was impressed with this fact when reading accounts of the recent field meet held at Birmingham, May 29, under the auspieces of the Alabama Safety Association and other similar organizations, both local and national.

According to the officials, this was the most successful first-aid meet ever held in this country. On the other hand, I have heard a great many criticise the work that was done and the manner in which it was judged by those appointed to pass on the merits of the different teams taking part in the contest. I notice that a brief comment in *Coal Age,* June 19, p. 1065, offered the same criticism of some of the judges. My observations at the time inclines me to the belief that these criticisms were not nearly severe enough.

I do not like to think that these organizations, formed for the benefit of the hard-working classes, comprise among their officers an exclusive aristocracy. It is to be hoped that this is not the case, for the sake of the future success of the first-aid movement.

Before giving the results of my observation on the field I want to ask, What constitutes a successful meet? Is it the number of teams contesting, or is it the quality and proficiency of the work they perform? Numbers undoubtedly lend enthusiasm to a movement, but few will deny that the quality of the work done by the teams, and its manner of execution, are the factors that truly measure the success of the undertaking. Then, again, is it fair for those who have prepared themselves to enter such a contest to have their work judged by men whose knowledge of the requirements of the contest and the aims sought to be attained is doubtful?

For the good that it may do, I want to state briefly how this meet appealed to me and to a great many others who were present though not participating in the event. It will be readily agreed that the rules drawn up to govern the contest should be rigidly enforced. The judges should be familiar with these rules and should base their judgement on the manner in which the different teams conform to the regulations. In this connection, I will cite a single instance.

I noticed that many of the negroes who had entered the contest were working with their bandages, splints, etc., all ready prepared, and that some of the white teams were doing the same thing. Believing that the best interests of the first-aid work should be carefully watched, I reported my observations to the chairman of the meet. He did not seem too well pleased, and replied, "We can't look into all the details." I have always thought that the details of first-aid work were what counted. But the tone and manner of the chairman told me that further suggestions were not acceptable. I found, a little later, that many of the judges were giving credits for work performed by the teams that, in truth, should have been penalized.

I want to suggest further that the spectators, in this case, were kept at too great a distance to observe closely how the work was done and benefit thereby. One of the objects of the meet should be the education of the onlookers. We should not forget, also, that the children of today are the men and women of tomorrow; and these should be invited and permitted to see how the work is performed. If we are in earnest in securing the best results of this movement, we must remember that the greatest success can only be attained when everyone in an industrial community is in harmony with the objects sought and the manner of their accomplishment.

William Crooks.

Ensley, Ala.

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Preventing Mine Explosions

Letter No. 4—I say, with Mr. Rose, *Coal Age*, May 8, p. 819, that in all mines wherein explosive gas is given off in sufficient quantities to warrant its being designated as "gaseous," there will continue to be explosions until certain practices that now exist are eliminated. According to methods based on practical principles, a mine is pronounced "in safe condition when free from gas."

This report is the result of a recent examination in which no explosive mixture was detected at any point in the mine. Nevertheless, the air current in this mine may be quickly converted from a so-called "safe condition," to a highly dangerous condition as the result of many common causes, such as a sudden decrease in the supply of fresh air, owing it may be to a door or regulator being left open or changed, or to an increase in the amount of gas owing to fresh feeders being tapped.

Now, with the present standard of efficiency in the ventilation of mines required by the laws of Pennsylvania, and mine-foremen and firebosses discharging their respective duties faithfully and using no other light than an approved safety lamp in examining the mine, and all shots being fired by competent shotfirers, after the men have left the mine, and compressed air being used as a substitute for electricity, the liability to gas explosions will be reduced to a minimum. The objections made to these suggestions will no doubt be many and come from operators and miners having only their own personal gain in view, but it must be admitted by all fair-minded thinkers that their general adoption would add to the safety and welfare of all concerned.

Robt. Brown.

Bolivar, Penn.

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Mining Laws and Legislation

Letter No. 7—I have been much interested in the letters relating to the legal responsibility of the assistant mine foreman under the Pennsylvania mine law. Reference has been made to the suit instituted a short time ago by a district mine inspector against Assistant Mine Foreman Joseph Willis, charging him with neglect of duty in failing to see that suitable timbers were set in a room where a miner was killed while at work, by a fall of slate. It developed that the assistant foreman had instructed the miner to set the necessary props as he had some bad roof in his room. The miner neglected to do as he had been instructed, with the result that he was crushed to death by the fall that took place shortly after these instructions were given.

The question in my mind is, Can this assistant foreman be held responsible for the neglect of the miner, after having given him instructions to make his place safe? The Pennsylvania bituminous law (1911), art. 25, rule 1, states as follows:

> The miner shall examine his working place before beginning work and take down all dangerous slate, or otherwise make it safe by properly timbering it, before commencing to mine or load coal. . . . The miner shall at all times be careful to keep his working place in a safe condition during working hours.
>
> Should he at any time find his place becoming dangerous, . . . he shall at once cease working and inform the mine foreman or the assistant mine foreman of said danger, etc. . . . He shall order all props, cap pieces, and other timbers necessary, at least one day in advance of needing them. . . . If he fails to receive said timbers and finds his place unsafe, he shall vacate it until the necessary timbers are supplied.

These rules and regulations are, or should be, posted at every mine, printed in different languages, so that each miner can read them and know that he has duties to perform, the same as the mine foreman and his assistant.

If the miner, therefore, neglects to do his duty after receiving instructions from his foreman or an assistant, he is responsible for any accident that may result from such neglect. As I said before, I fail to see how a mine foreman or his assistant can be held responsible for the miner's neglect, after he has performed his duty by instructing the miner to make his place safe.

The mine inspector is often prone to require more of the mine foreman and his assistant than can be naturally expected of these officials. Too often the entire responsibility for an accident is laid on the shoulders of the mine foreman or his assistant, the mine inspector claiming that the mine foreman should see that his instructions are carried out. I would ask, Does the mine inspector himself follow the same rule? He calls the mine foreman's attention to a violation of the law, or unsafe condition, and takes it for granted that the matter will be remedied before his next visit. Could it be expected that he would remain at the mine to see that his orders are carried out promptly? It would be just as unwise to expect the mine foreman or assistant foreman to remain in a single place to see that his instructions are promptly obeyed.

If the foreman or his assistant is to be held responsible for accidents resulting from the neglect of workmen to obey his instructions, it follows that the mine inspector should likewise be held responsible for accidents resulting from the neglect of mine officials to comply with his orders. If a foreman or his assistant were compelled to stay and see that his instructions were obeyed, he could not complete his rounds; but the law places this responsibility on the miner, who must obey the instructions given him, as required in art. 4, sec. 9, which reads as follows:

> . . . Any workman who neglects to carry out, or disobeys the instructions of the mine foreman or his assistant, in regard to securing his working place, shall be suspended or discharged by the mine foreman, and if such negligence or disobedience results in serious injury or loss of life to any person, the mine foreman shall give the name of said workman to the inspector for prosecution in accordance with sec. 2, art. 26, of this act.

Art. 26, sec. 2, reads as follows:

> Any person who neglects or refuses to perform the duties required of him by this act, or who violates any of the provisions or requirements thereof, shall be deemed guilty of a misdemeanor and shall, upon conviction thereof, in the Court of Quarter Sessions of the county in which the misdemeanor was committed, be punished by a fine not exceeding $200, or imprisonment in the county jail for a period not exceeding three months, or both, at the discretion of the court.

I would ask, If a miner is held legally responsibile for the death of another person resulting from his own neglect, why should he not be responsible for his own death resulting from such neglect?

I am a firm believer in a uniform system of timbering. I believe each miner should be instructed by his foreman or assistant in regard to the system of timbering adopted in the mine. If a miner fails to carry out these instructions, he should be suspended or discharged; and, in case of accident resulting from such neglect, he should be prosecuted, as required by law. If this were done, more heed would be given by the miners to their instructions, and there would be fewer accidents at the working face. I hope to hear from other mine foremen and assistants along the same line.

OLIVER YOUNG, Assistant Mine Foreman,
Cowanshannock Coal & Coke Co.

Nu Mine, Penn.

Study Course in Coal Mining

By J. T. BEARD

The Coal Age Pocket Book

Method of Calculation—The calculation of the heat of combustion from the heats of combination of the combustible and the several products formed, will be best understood by a practical illustration following the statement of a few fundamental principles that always govern the operation. Briefly stated these are as follows:

1. No heat energy is lost, but the heat of an element, in any reaction, is zero, there being neither combination nor dissociation possible in the element as in a compound.

2. Total heat of formation of products is the **positive (+) heat** developed in the reaction.

3. Heat of decomposition (same as heat of formation) of the combustible is the **negative (—) heat** or the heat absorbed in the reaction.

4. The heat of combustion is the **net heat**, or the difference between the total heat in the products and the heat in the combustible.

5. The reaction generates heat, or is **exothermic,** when there is an excess of positive (+) heat.

6. The reaction absorbs heat, or is **endothermic,** when there is an excess of negative (—) heat.

Note—The **chemical equation** expressing a reaction shows the equivalence of weight of matter before and after reaction, but does not show the thermal effect.

A **thermochemical equation** is written by adding to the chemical equation a positive or a negative term indicating the heat generated or absorbed in the reaction. This heat may be expressed as "gram-calories," "kilogram-calories," or "pound-calories," according as the weight of the combustible taken is a gram-molecule, a kilogram-molecule or a pound-molecule. Or, the heat of the reaction may be given as B.t.u. per pound, or other denomination. The weight-unit is immaterial, since the **heat of the reaction** is always that due to the molecular weight of the combustible expressed in the same weight-unit.

The amount of heat corresponding to the molecular weight of the combustible (expressed in any weight-unit) is frequently called the **"molecular heat"** of the reaction.

The molecular heat of a chemical reaction, divided by the molecular weight of the substance consumed, gives the heat of the reaction per unit weight of substance, which is the heat of the combustion expressed in the same denomination as the weight of the substance.

Illustration—The heat of combustion of methane (CH_4), as determined by Favre and Silbermann (See Table), is 23,513 B.t.u. per lb.; or $23{,}513 \times {}^5/_9 = 13{,}063$ lb.-cal. per lb.; or 13,063 kg.-cal. per kg., or grm.-cal. per grm. of the gas.

The molecular heat of this reaction is therefore

$$16 \times 23{,}513 = 376{,}208 \text{ B.t.u.}$$

or

$$16 \times 13{,}063 = 209{,}008 \text{ cal.}$$

It is observed, thus, that the molecular heat, in the combustion of methane, is the heat (B.t.u.) generated by 16 lb. of the gas; or the heat (lb.-cal.) generated by the 16 lb.; or the heat (kg.-cal.) due to 16 kg.; or the heat (grm.-cal.) due to 16 grm. of this gas. Different authorities have obtained slightly varying heat values of the gases.

The Coal Age Pocket Book

Writing a Thermochemical Equation—The thermochemical equation expressing the reaction that takes place and the heat that is generated in the combustion of methane (CH_4) is written thus:

$$CH_4 + 2\ O_2 = CO_2 + 2\ H_2O - 388{,}100 \text{ B.t.u.}$$

Or, in the French system,

$$CH_4 + 2\ O_2 = CO_2 + 2\ H_2O - 215{,}600 \text{ cal.}$$

The reaction is exothermic, or generates heat, which is the excess of the heats of formation of the products of the combustion (carbon dioxide and water), over the heat of formation of the combustible (methane).

Likewise, for the combustion of carbon to carbon dioxide, which generates 14,550 B.t.u. per lb., or $14{,}550 \times {}^5/_9 = 8083$ cal., the molecular heat of the reaction is $12 \times 14{,}550 = 174{,}600$ B.t.u., or $12 \times 8083 =$ say 97,000 cal. The thermochemical equation expressing this combustion is

$$C + O_2 = CO_2 - 174{,}600 \text{ B.t.u.}$$

or

$$C + O_2 = CO_2 - 97{,}000 \text{ cal.}$$

In these equations, the heat of combustion is equal to the heat of formation of the product (carbon dioxide), the heats of the elements (carbon and oxygen) being zero.

Heats of Formation of Substances—The heats of formation of a few substances that are of interest in mining are given in the following table. The heats are given as molecular heats for convenience of substitution in equations.

TABLE OF HEATS OF FORMATION OF SUBSTANCES

		Molecular Heats of Formation	
Substance	Symbol	B.t.u.	Cal.
Methane	CH_4	39,060	21,700
Acetylene	C_2H_2	98,550	54,750
Ethene (olefiant gas)	C_2H_4	—20,250	—11,250
Ethane	C_2H_6	47,970	26,650
Carbon monoxide	CO	52,200	29,000
Carbon dioxide	CO_2	174,600	97,000
Hydrogen sulphide	H_2S	8,640	4,800
Sulphur dioxide	SO_2	124,668	69,260
Ice (32° F.)	H_2O	128,880	71,600
Water (32° F.)	H_2O	126,288	70,160
Water (212° F.)	H_2O	123,048	68,360
Steam (212° F.)	H_2O	105,660	58,700

For the most part, the heat values in the above table have been determined by experiment, by means of the calorimeter. The values of the heats of combustion, as calculated from these molecular heats of formation, by substitution in the chemical equation expressing the reaction, will not be found to check the earlier determinations of Favre and Silbermann; but the variation is slight.

For example, writing the thermochemical equation for the combustion of methane, indicating the required heat of combustion by x, we have

$$\begin{aligned} CH_4 + 2\ O_2 &= CO_2 + 2\ H_2O - x \\ 39{,}060 + 0 &= 174{,}600 + 2(126{,}288) - x \\ x &= 174{,}600 + 2(126{,}288) - 39{,}060 = 388{,}116 \text{ B.t.u.} \end{aligned}$$

Then, the molecular weight of methane being 16, the unit heat of combustion is $388{,}116 \div 16 = 24{,}257$, instead of 23,513 B.t.u

Inquiries of General Interest

A Dangerous Condition

We have recently been facing what some have advised was a dangerous condition in one of our mines. The seam is 12 ft. in thickness, and has an inclination of 21 deg. The coal is bituminous, low in volatile matter, and fairly hard. There is more or less fireclay in the bottom, while the top is hard and does not break readily.

At the present time the mine has been developed to its full extent and work in the lower part of the mine has been abandoned. The work of drawing the pillars in the upper portion has been progressing, until we have reached a point where it has seemed doubtful whether this work can be continued much farther with safety.

There is naturally an inclination on our part to go as far as it would be considered safe, and perhaps even to take chances that may seem unwarranted to an unprejudiced mind.

Now, I would like to ask, Are there not some readers of *Coal Age* who have had just such experience in the working of a thick seam of coal on a considerable inclination under a hard roof that would not break? If there are any such I would very much appreciate learning of their experience, and receiving from them suggestions of what in their best judgment is the safest method to pursue, or whether it would be dangerous or assuming an unwarranted risk to continue to draw the pillars in the upper portion of the mine.

The mine to which I refer has been opened by a slope driven on the full dip of the seam and having a total length of practically 5000 ft. This main slope is used as a haulage road, and is flanked on either side with a pair of entries, which are used for ventilation, drainage and manways. These main-slope headings thus consist of five parallel entries. Cross-headings or levels are driven to the right and left of these slope entries, every 100 yd. on the strike of the seam, and rooms turned to the rise off these levels.

The surface being generally level, the depth of cover at the foot of the slope was practically from 500 to 600 yd. It would seem that there should be some practical method that could be adopted for the more or less complete extraction of the coal left in the pillars.

General Superintendent.

———, Alberta, Canada.

The above inquiry presents a practical question of great interest in coal mining. The conditions described duplicate to a considerable extent those recently discussed in *Coal Age* in reference to the Pittsburgh seam, known as the No. 8 seam in Ohio. The discussion in that case referred to the question as to whether that seam could be worked successfully by the longwall method of mining. The case considered in the above inquiry, however, refers to a fully developed mine, in which the work of drawing back the pillars is in progress, with the result that no satisfactory break of the roof has been secured, and the question of the safe continuance of the work is in considerable doubt. Let the readers of *Coal Age,* many of whom have had experience under similar circumstances, say what, in their judgment, is best or safe.

⁂

Variation in Line Drop

Kindly answer in *Coal Age* the following question which has puzzled me:

If the drop on a given section of road where electric haulage is employed is 50 volts when the load is uniformly distributed, what will it be if the whole load is concentrated at the end of the line? Explain fully.

Electrician.

Linton, Ind.

In answer to this question it may be stated that a uniformly distributed load in electric haulage is equivalent, in respect to the total resistance or line drop, to the same load concentrated at the center of the line. Also, the line drop is always proportional to the resistance of the line, and this resistance is proportional to the distance of the load from the power station. Hence, a load at the end of the line will cause a line drop of twice that due to the same load at the half-way point.

Therefore it may be said that if the line drop is 50 volts when the load is uniformly distributed, the drop will be double this amount, or 100 volts, when the same load is concentrated at the end of the line.

This answer, of course, is only approximately true, since there are numerous causes in electric haulage that operate to modify both the resistance and the consequent line drop. Such modifications, however, would have to be considered in detail, involving data not given.

⁂

A Question on Heat

How much heat will be required to convert 10 lb. of ice, at a temperature of 18 deg. F., into steam, at an absolute pressure of 30 lb. per sq.in.?

Joseph J. Dorotinsky.

Waltersburg, Penn.

The specific heat of ice being 0.504, the heat absorbed for a rise of temperature from 18 deg. to 32 deg. F. is 0.504 (32 — 18) = say 7 B.t.u. per lb. To this must be added the latent heat of ice, or the heat absorbed in melting (144 B.t.u. per lb.), which gives for the total heat absorbed when the ice has melted 7 + 144 = 151 B.t.u. per lb. The total heat above 32 deg. F., in steam at 30 lb. absolute pressure, as taken from steam tables (Marks and Davis), is 1164 B.t.u. per lb., which makes the total heat required to convert 10 lb. of ice, at 18 deg. F., into steam at 30 lb. absolute pressure,

$$10\ (151 + 1164) = 13{,}150\ B.t.u.$$

Or, since latent heat of steam is 966 B.t.u., specific heat 0.48, and temperature at 30 lb. pressure, 250 deg F., the same result is obtained thus: $10[151 + (212 - 32) + 966 + 0.48\ (250 - 212)\ ] = 13{,}150\ B.t.u.$

Examination Questions

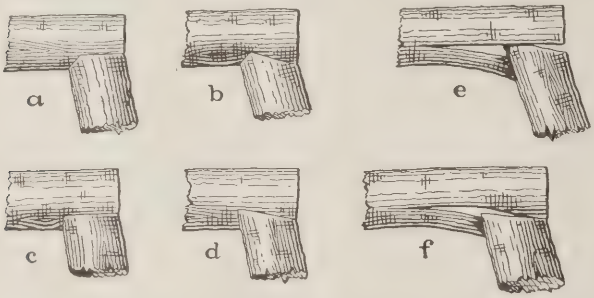
Alberta (Canada) Examination, June 15-17, 1915

(*Selected Questions*)

Ques.—When is it necessary to notch timber? Sketch and describe the correct and incorrect methods of making two notches with which you are acquainted. Show by sketches the effect of improper notching on the life of mine timber.

Ans.—All timbers forming a part of a timber frame should be notched.

In the accompanying figure are shown two methods (*a* and *b*) in quite common use for notching mine timbers when timbering airways and haulage roads. The method shown at *a* presents a horizontal bearing surface for the top of the leg, while that at *b* is inclined. In both of these methods, the notch is cut at an angle with the axis of the collar, which is correct. The method shown at *a*, however, is preferable as the bearing surface is there at right angles to the direction of the roof pressure.



PROPER AND IMPROPER METHODS OF NOTCHING MINE TIMBERS

At *c* and *d* are shown the incorrect methods of making the two notches just described. The notch at *c* is cut at right angles to the axis of the collar instead of being cut at an angle, as shown at *a*. The notch at *d* is cut forward in the collar so that it is nearly parallel to the axis of the leg. Both of these methods present more or less of a tendency to split the collar, as shown at *e* and *f*.

Ques.—What is the total pressure at the bottom of a pipe full of water, 10 in. in diameter and 600 ft. high?

Ans.—The pressure due to a head of water of 600 ft. is $600 \times 0.434 = 260.4$ lb. per sq.in. The total pressure exerted on the sectional area at the bottom of a 10-in. pipe is therefore $260.4 (0.7854 \times 10^2) = 20{,}451.8$ lb., or nearly $10\frac{1}{4}$ tons.

Ques.—Describe the danger that attends the use of electricity in and about coal mines and the safeguards necessary.

Ans.—The principal dangers from the installation of electricity in coal mines are contact of men or animals with live wires and ignition of gas or combustible material by the sparking of wires, short-circuiting of the current, burning out of fuses, etc. To avoid the danger of contact, all live wires should be properly safeguarded by a suitable installation of the wires or by the necessary protection of the trolley wire at all points where men or animals are liable to come into contact with the same. Men or animals should not be allowed to travel on entries or haulage roads where trolley or other live wires are installed. All electric installations should be made by a competent electrician, and switchboards and other electrical appliances should be in charge of competent men and inspected daily.

Ques.—Define the terms "force," "work," "foot-pounds" and "horsepower."

Ans.—The term "force" describes any agency that produces or tends to produce any change in the condition or state of matter, whether physical, mechanical, electrical, chemical or magnetic.

The term "work," in mechanics, describes the result of a force acting through a certain distance. The work performed is measured by the product of these two factors.

The term "foot-pounds" expresses the measure of a given work, as being the product of the distance, in feet, and the force exerted, in pounds.

The term "horsepower" is the mechanical unit of power in common use and is equal to 33,000 ft.-lb. per min. It expresses the work performed in a unit of time and assumes that the average work of a horse is 33,000 ft.-lb. per min.

Ques.—Describe how you would examine a steel wire hoisting or haulage rope, and mention where defects are most likely to be found. How would you protect the rope in a wet shaft or slope?

Ans.—A wire hoisting or haulage rope must be carefully examined at regular short intervals for any broken or defective strands that are badly worn and liable to break. A common practice is to allow the rope to pass slowly through a bunch of oily waste held in the hand. This, however, will only detect strands that are broken and protruding from the rope. All hoisting ropes especially should be more carefully examined, to ascertain the amount of the wear of the outer strands. All ropes used on haulage slopes should be examined in the same manner. Special attention should be given to that part of the rope within a few feet of the end couplings, which is more liable to be injured by the kinking of the rope when slack is given. Also, that portion of the rope resting on top of the head-sheave and exposed to the weather when the cage is at the shaft bottom or at the upper landing should be carefully examined. This portion of the rope is also subject to greater strain, owing to the additional bending stress at the moment the load is being started from the bottom of the shaft.

To protect a rope in a wet shaft or slope, it should be treated with an application of tar, boiled oil or other dope that will penetrate the rope and protect the strands from the corrosive action of the mine water. Such application should be made as the conditions require.

Coal and Coke News

Washington, D. C.

Figures prepared by the Department of Commerce for May and the 11 months ending with May and showing exports of coal from the United States for the periods in question have just been issued. These show the following results:

Countries to Which Exported	May				Eleven Months Ending May					
	1914		1915		1913		1914		1915	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value	Tons	Value
Anthracite—										
Canada	469,441	$2,524,181	412,479	$2,137,483	4,131,075	$21,936,325	3,469,646	$18,274,302	3,269,000	$17,249,269
Uruguay	....	....	....	....	....	....	84	559	....	....
Other countries	6,042	30,435	10,215	46,202	73,741	371,012	56,119	276,863	60,552	284,392
Total	475,483	$2,554,616	422,694	$2,183,685	4,204,816	$22,307,337	3,525,849	$18,551,724	3,329,552	$17,533,661
Bituminous—										
Italy	....	....	285,027	$845,870	....	....	....	....	1,245,260	$3,724,408
Canada	705,562	$10,572,992	589,512	1,256,291	10,563,330	$25,836,505	10,678,541	$24,950,666	7,551,864	16,478,270
Panama	22,150	59,805	34,321	93,869	443,249	1,196,448	336,617	910,602	295,664	808,588
Mexico	20,951	89,285	30,247	132,235	406,249	1,136,658	280,526	962,445	369,166	1,616,242
Cuba	82,851	231,042	107,650	297,228	1,167,681	3,136,986	1,048,379	2,914,352	990,222	2,781,770
Other West Indies and Bermuda	50,824	153,120	34,471	102,827	550,055	1,551,019	532,108	1,560,854	413,486	1,262,727
Argentina	11,078	34,852	108,730	322,930	....	....	129,432	371,536	406,058	1,224,286
Brazil	16,391	55,842	65,183	198,430	....	....	229,059	732,495	404,780	1,235,894
Uruguay	11,581	34,743	14,401	42,280	....	....	56,252	165,292	91,671	268,272
Other countries	162,425	478,615	134,735	396,830	1,060,966	3,059,127	1,228,486	3,623,106	711,414	2,114,894
Total	1,083,813	$2,710,296	1,404,277	$3,688,790	14,191,530	$35,916,743	14,519,400	$36,191,348	12,479,585	$31,515,351

The showing indicates unexpected improvement in May as compared with conditions previously existing during this fiscal year; and on the strength of this some people are again predicting large development of the export trade in coal.

The following study of the bunker coal situation at the Panama Canal has been issued by the Isthmian canal commission which calls attention to the requirement of additional equipment to meet needs prior to the completion of permanent plants.

The difficulties of coaling vessels promptly at Cristobal, which have been experienced as the result of the increasing demands of vessels and the noncompletion of the permanent coaling plants, have been lessened by the use, in addition to the previous facilities, of four motor-driven conveyors, or hoisters, which are used to discharge coal from barges and lighters alongside vessels into their bunkers. Two 500-ton barges have been fitted for this service, each with two conveyors. The conveyors are of the Demayo make and consist essentially of an endless chain of scoops, operating in a vertical steel casing about 25 ft. high, from the top of which the material being handled is discharged into a pipe chute, passing by gravity to its destination. The elevators are suspended by cables from booms. This regulates their elevation while they dig into the coal and allows their being swung about to reach any point in the hold of the barge.

The first use of this new equipment on commercial vessels was in the coaling of the steamship "Finland" of the Panama Pacific Line, which passed through the Canal on her way from New York to San Francisco on June 24. On the second vessel coaled, the "Guatemala" of the Pacific Steam Navigation Co., the rate of supply was 26½ tons per hour. This is regarded as low for this equipment, and it is expected that when the operators shall have become thoroughly trained to their work each barge will supply approximately 60 tons per hour. If such effectiveness be attained the facilities for bunkering at Cristobal will have been practically quadrupled.

In the mean time, work is being pushed on the permanent coaling plant for the Atlantic entrance as rapidly as the material is supplied by the contractors. It is planned to complete two of the four unloader towers in September, and, by a modification of their construction, use them for both unloading colliers and loading into customer vessels from the stock pile. This is a temporary expedient, for use only until the regular reloader towers shall be completed, but as the two towers command a considerable storage space and each will be capable of handling about 250 tons an hour, it will in all probability meet the situation quite satisfactorily until the completed plant is in service.

All four of the towers for the plant have been erected, but the two toward the outer end of the wharf are those on which early completion is being pushed. The two stocking and reclaiming bridges have been practically completed with respect to the structural work, but the machinery is yet to be installed. They will probably be completed by the end of September. The material for the reloader towers has begun to arrive from the United States and their erection will begin shortly. The viaduct commanding the dry storage space is about 50 per cent. completed. The dredging alongside the wharves has advanced sufficiently to allow vessels access to the plant whenever desired.

At the Pacific plant, one of the two unloader towers is practically erected, and all four of the berm cranes, which will be used for stocking and reclaiming, have been erected. Work has not begun on the two reloaders, the wharf for which is yet to be built; the sinking of caissons for this wharf is in progress. This construction is intimately related to that of the drydock, as the coaling plant will form one side of the entrance slip to the dry dock, and the work is held back somewhat by the need of the dry dock construction.

HARRISBURG, PENN.

The Public Service Commission has held in the case of the Pittsburgh Plate Glass Co. against the Pennsylvania R.R. Co., that the collection of demurrage on the shipments complained of was not provided for by the tariffs of the respondent in force at the time of the complaint.

The Pittsburgh Glass Co. complained that the Pennsylvania R.R. Co. was charging and collecting from it demurrage upon loaded coal cars belonging to the glass company, transported by the railroad company from the mines of the glass company, and placed upon the private siding of said glass company, at its factory, at West Tarentum.

The complainant is the owner of a plate glass factory. It owns also a coal mine ¾ mile away, from which it ships the coal needed in the factory, on the line of the respondent railroad. It owns also a number of steel hopper cars in which the coal is shipped and which are used exclusively for this purpose. The railroad company charges the regular tariff rates for the transportation, making allowance to the glass company of 0.6c. per mile for each car. The railroad company charged a demurrage for these cars at the rate of $1 per car per day while these cars, after delivery, stand loaded upon the tracks of the complainant constructed by it upon its own property. It is the charge of demurrage to which the glass company objected. The general rules respecting demurrage, which have met the approval of the Interstate Commerce Commission, provide as follows: "Private cars while in railroad service, whether on railroad company or private tracks, are subject to these demurrage rules, to the same extent as cars of railroad ownership. Empty private cars are in railroad service from the time they are placed by the railroad company for loading or tendered for loading on the orders of the shipper. Private cars under lading are in railroad service until the lading is removed and cars are regularly released."

The Commission decided that this was a case which ought to be decided upon its own facts, and these facts distinguish it from most, if not all others which have been heretofore determined. It was contended for the railroad company first, that the case of the glass company is within the language of the above cited rule; second, that certain authorities which were cited have determined the question here raised upon principal in favor of the railroad company.

The commissioners decided that the facts presented did not show the cars were in the service of the carrier. They could not be used by the carrier for any other purpose than the service of the complainant. At the time the demurrage was attempted to be imposed, these cars had been delivered to the complainant and were its own cars, filled with its own commodities (coal) upon its own tracks. The railroad company denied any liability for the cars or lading after delivery upon the owner's siding. Under these circumstances the Commission holds that the enforcement of demurrage seems entirely to fail. Its enforcement could not compel the prompt return of the cars. The railroad company had no right of any kind to the cars, their use or possession. The glass company after unloading might retain the cars and never return them. No right to possession upon the part of the railroad could in any way be maintained. The argument that the carrier ought to be enabled to know upon how many private cars it may depend in order that it may secure sufficient other cars for its service, is not sustained by the Commission, because these cars could never have been depended upon for such service and the railroad company could not have been misled.

The Commission held that the language of the general demurrage rule does not specifically refer to the case of the delivery of cars to their owner upon his own tracks, and ordered the railroad company to cease and desist from charging and collecting from the glass company demurrage upon the loaded coal cars of the glass company transported by the Pennsylvania R.R. Co. from the mines of the glass company and placed upon the private siding of the glass company at its glass factories.

PENNSYLVANIA

Anthracite

Shenandoah—Two miners, Thomas Murt and Michael Laura, were recently entombed in the Knickerbocker colliery of the Philadelphia & Reading Coal & Iron Co. from seven o'clock in the evening until one o'clock the next morning. The accident was due to a fall of top coal covering a distance of 100 ft. Officials of the company arrived on the scene promptly and immediately instituted extensive measures for rescue. These were exceedingly dangerous, on account of the continuous falls of coal. Due to the zealous efforts of the rescuers instead of the work taking a day or more as expected, the men were reached in six hours. They were unhurt and on account of being on a night shift had no knowledge of their peril until they heard the work of the rescue party.

Sunbury—There is considerable agitation among the companies and individuals engaged in dredging coal from the Susquehanna and other rivers of the coal region as to whether they come within the provisions of the anthracite tax act of 1915. It is the opinion of some that the river dredgers are covered by that portion of the act relating to washeries, whose product was not taxed under the old law. There is no doubt that the Attorney General will soon be called upon to render an opinion covering the disputed point.

Gilberton—One thousand employees of the William Penn colliery struck on July 31 because two workmen refused to wear new union buttons and pay up arrears. This compelled the colliery to suspend operations.

Nesquehoning—Two miners, Leo Sparish and John Domita, employed by the Lehigh Coal & Navigation Co., were overcome by black damp in the company's tunnel recently. After prolonged and difficult efforts to induce respiration they were revived and are expected to recover.

Plymouth—The Delaware & Hudson Co. has issued orders that its No. 2 colliery will work double time or two 9-hr. shifts daily. This is done to make up for lost time at No. 5 colliery of the same company. Work was suspended at No. 5 some time ago in order to make alterations to the breaker whereby the coal run through may be washed. Coal from Nos. 4 and 5 mines, also the Boston coal goes through No. 5 when in full operation, but the coal from Boston and No. 14 can be run through No. 2, hence the mines will go on double time. Night shifts in this locality will be a novelty to the miners, particularly at this time when other companies are running slack. The Delaware & Hudson Co. ships a large quantity of its coal to Canada.

Sunbury—Maintaining that the company was negligent in failing to provide sufficient protection against accidents, the Philadelphia & Reading Coal & Iron Co. has been made the defendant in a suit for $30,000 brought by John Colesbody, of Shamokin, who was crushed by a fall of coal in one of the company's collieries.

Hazleton—While boring for water, James Blanchard, an artesian-well driller, struck a bed of fine anthracite on the property of the Mill Creek Coal Co. Geologists had long asserted that coal measures did not exist north of the New Boston mines, but this recent discovery disproves their theory. Arrangements have been made to continue boring tests and it is altogether likely that a new operation will soon be started.

Jeddo—The new steel breaker of the G. B. Markle Co. was recently completed and the machinery given a trial run which was satisfactory in every particular. This work has been completed in a remarkably short time. Coal is now being run regularly through this plant.

Bituminous

Marianna—It is reported that the sale of the Marianna Mines to the Union Trust Co., of Pittsburgh, will be confirmed shortly, and that the mines will be open for operation by Aug. 15. It is said that this operation will be conducted under a company yet to be organized.

Elizabeth—Eight men were killed and 12 injured July 30 at the Patterson Mine of the United Coal Co., at Lovedale. A cable hauling a trip of cars up an incline broke, the cars ran down the hill, left the track at the tipple and fell something like 50 ft. into a gang of railroad laborers at work on a spur track under the tipple. Among those killed was F. P. Dougherty, superintendent of the mine.

Monongahela—Work in all the mines of the Pittsburgh-Westmoreland Coal Co., located in this section will be resumed in full at once. The company has received several large contracts from abroad. The mines affected are the Acme, Hazlekirk No. 1 and No. 2, Dunkirk and Schoenberger. Acme has been running one or two days a week and Hazlekirk men have been getting a day or so occasionally, while Schoenberger has been doing fairly well. Van Voorhis and Dunkirk have been closed tight for more than nine months. When these mines are working full it makes a material change in business conditions here.

Connellsville—Merchant coke operators of the Connellsville region are developing a healthy export business. Since the shipment of coke to Argentine Republic consumers, Italy is getting coke from here. A Uniontown firm also recently sold 44,000 tons of coal to a New York jobber for shipment to Spain.

Boswell—The Somerset County Miners' First Aid Meet, which has heretofore been held at Somerset will be held this year at Boswell on Sept. 4. This will give opportunity to a much larger number of miners to attend the meet.

WEST VIRGINIA

Charleston—It is reported that accidents and fatalities in West Virginia are increasing instead of decreasing. Records of 421 accidents were filed recently during one week, also the occurrence of 11 deaths through accidents; 85 accidents were recently reported in one day alone. This is a higher average than has ever before been known in the state.

A coal company operating in Fayette County recently sent a call to the Pittsburgh distribution branch of the U. S. Immigration Service for 1000 miners. Steady work and good wages are guaranteed. It is said that several thousand miners have been sent into West Virginia from Pittsburgh during the past few months.

The free employment bureau of the State Department of Labor recently had a call for 500 loaders and miners for immediate employment. These men were wanted to operate the Jamison Mines Nos. 7, 8, and 9, near Fairmont. No labor trouble exists at these operations, the need for the men being occasioned by an increase in production.

Fairmont—Two men were recently killed and one severely injured in a gas explosion at the shaft being sunk on Finch's Run by the Federal Coal Co. The men carrying an open light had gone down the shaft to do excavating work. They detected the odor of gas and were attempting to get back when the explosion occurred. The two men killed were Croatians and brothers.

Morgantown—Announcement has been made by the Board of Equalization and Review that the assessments on coal acreage of Monongalia County will be lowered from 5½ to 12 per cent. The percentage of decrease varying with the situation of the coal properties with respect to facilities for operation. This will, roughly estimated, lower the assessed value of coal properties in the county $1,275,000.

Leckieville—Four frame tipples are being built at this plant and endeavors are being made to have the plant in operation by the first of the year with a loading capacity of 4000 tons of coal per day. Work has been begun on 150 modern six and eight-room dwellings for the employees. Granolithic walks will be laid in the town and the streets will be macadamized. A modern school house will be immediately built and also a church. It is the intention to spare no expense in making this operation and town one of the most modern in every respect, including sanitation, amusement and recreation, to be found anywhere in the West Virginia coal fields.

KENTUCKY

Frankfort—A considerable portion of the contents of a new volume issued by the State Geological Survey deals with the coals of western Kentucky, the geological history of which section is traced. The report deals with the coals of the Nortonville, Drakesboro, Dunkor and Little Muddy quadrangles. Speaking of the coals the report says that they are inferior to the coals of eastern Kentucy, West Virginia and Pennsylvania and do not stand shipping as well as the Eastern coals, nor do they have the same clean appearance. They are bituminous, and, compared to the others mentioned, are relatively high in volatile matter, ash and sulphur.

MARYLAND

Cumberland—Four men, Elmer Kallmyer, William McLaughlin, and his two sons, William Jr., and George, were imprisoned behind a fall of roof in the Eckhart No. 3 mine of the Consolidation Coal Co., on the afternoon of July 27. They were rescued at noon the following day by State Mine Inspector William Walters and a rescuing party. The four imprisoned men walked out of the mine unhurt and little the worse for their experience.

OHIO

Steubenville—The mine of the Pluto Coal Co., at Rayland, has been closed indefinitely and the power house boarded up. Almost all of the machinery has been withdrawn from the mine and stored. This closes the plant indefinitely.

Glouster—At a meeting of miners recently held, resolutions were adopted protesting against the rates charged by railroads for hauling Ohio coals. It is declared that discrimination in favor of operators of other states has forced Ohio coal men to close their mines.

Columbus—The New Freight law, passed at the last session of the Ohio General Assembly, which changes the time of filing proposed changes in traffic rates became effective in Ohio July 30. The measure provides for a suspension of a proposed tariff increase when a petition is filed with the Ohio Utilities Commission. A suspension of 30 days may be granted for the purpose of investigating the reasonableness of the proposed increase and if that is not sufficient another 30 days' suspension is allowable. Heretofore carriers have been required to give only 10 days' notice of a freight change and now a 30 days' notice is required.

INDIANA

Evansville—The Big Four Coal Co., with a mine east of the city, has elected not to operate under the terms of the new state compensation law. Notice has been posted to this effect. Most of the mines in the Boonville, Ind., section operate under reciprocal insurance which, it is said, they have found cheap.

The state conference of the coal miners' unions of Indiana will be held here next March and several hundred delegates are expected. The compensation law, which will become effective Sept. 1, is expected to have an effect on the wage scale which will be a matter for discussion. Heretofore the state conferences have been held in Terre Haute.

Boonville—It is stated that the fire which has been burning for more than a year at the Polk Patch coal mines, doing thousands of dollars of damage, has been controlled by confining the area of the fire to 150 acres. This fire was started when a fireman threw a shovelful of hot coal cinders upon an exposed part of the vein.

ILLINOIS

Christopher—Eight men were killed and 15 injured when a part of the east mine of the United Coal Mining Co., near here, was wrecked by an explosion July 27. An explosion of gas occurred in the southeastern entry of Mine No. 1. The dead are John Parks, George Eimacis, Frank Ponaski, Everett Swofford, H. M. Dufour, Alfonso Dufour and Julius Takaseh. About 400 men were in the mine, which is one of the oldest in the state, but only a few were in the vicinity of the explosion. Work had been resumed the day before, after a shut-down of three months. The bodies were taken out by a rescue team that was summoned from Benton. Mine officials thing that gas accumulated in an old level causing the explosion.

Gillespie—The new Carlinville Coal Co. has started operations. For the present mules will be used, but in about six weeks it is expected to have electric haulage installed. A new boiler will also be erected, together with 6000 ft. of heavy steel rails. This company intends to make its own electric current with which to operate the haulage, screen, fan, etc.

IOWA

Des Moines—State Mine Inspector Edward Sweeney reports that 1,804,968 tons of coal were mined in Polk County by 2857 men during the year just past as against 2,264,260 tons during the preceding year. Only 4430 men had been employed in mines of Iowa during the year ending July 1, while 4563 men were employed the year before.

COLORADO

Denver—The new workmen's compensation law took effect Aug. 1 and all coal operators are busily engaged making provisions to comply with it. Although employers may elect to not carry indemnity insurance, it is unlikely that any will do so for the reason that such a policy must be publicly announced. This places such employers at serious disadvantage in securing competent laborers while it practically deprives them of all legal defense whenever suit may be instituted for injuries or deaths. Operators are permitted to provide compensation insurance in one of four authorized ways, viz., they may carry policies written by private insurance companies; they may carry their own risks by first satisfying the commission of their responsibility; they may combine with other employers in forming mutual insurance companies for such indemnities; or they may purchase polices from the state's compensation insurance fund. The recent announcement by the commission prohibiting insurance companies from offering any form of rebate, refund or profit-sharing features has considerably disturbed a number of contracts already entered into.

PERSONALS

Thomas J. McNamara has been appointed sales manager of the Pittsburgh & Southwestern Coal Co. with office in Buffalo. The company has a mine at Avella, Penn.

Prof. E. E. Bach, sociological superintendent of the Ellsworth Collieries Co. has been asked to serve as an official judge of the interstate mine rescue contests to be held at the Panama-Pacific Exposition, San Francisco, Calif., from Sept. 23 to 26.

J. B. Henderson, superintendent of the Fort Hill, Paul and Rainey plants of the W. J. Rainey Coal Co., retired on Aug. 1, after 35 years with that concern. Mr. Henderson will be succeeded as superintendent of the three plants by Alvin Mitchell, now superintendent at Acme.

C. F. Mayer, who has been traffic manager of the Sunday Creek Coal Co. for more than 10 years, has resigned, effective Aug. 1. He announces that he will take an extended vacation before taking up other work. The place with the Sunday Creek Coal Co. will not be filled for the time being.

J. F. Bermingham has been elected to the presidency of the Delaware, Lackawanna & Western Coal Co., succeeding E. E. Loomis. Mr. Bermingham's election is one step in the plan to separate absolutely the Delaware, Lackawanna & Western Coal Co. from the Delaware, Lackawanna & Western R.R. Co.

E. J. Wallace, formerly St. Louis manager for the Dealers' Fuel Co., has been appointed district sales manager of the Hoover automatic typewriter, with headquarters at Cleveland, Ohio, and branch offices at Toledo and Youngstown. Mr. Wallace was prominently identified with the coal trade in St. Louis for several years.

Thomas Graham was recently elected chairman of the western branch of the Canadian Mining Institute. Mr. Graham is chief inspector of mines for British Columbia. Among those elected at the same meeting to membership in the branch was Charles Graham, superintendent for the Corbin Coal & Coke Co., operating in the Crowsnest district.

OBITUARY

Robert Lang, 76 years of age, superintendent of the Hill Farm mine near Dunbar, Penn., at the time of the explosion occurring there in 1890, died in the home of his son, in Mt. Pleasant, Penn., July 27. Mr. Lang came from Scotland in 1865 and followed the mines until he was overtaken by his final illness a few weeks ago. For the last 15 years he has been superintendent of a small coal plant of the Lang Coal & Sand Co., in Connellsville; he is survived by three sons and one daughter.

Geo. D. McCreary, financier and coal operator, died of heart disease in Philadelphia on July 26, aged 69 years. He was a director in the Upper Lehigh Coal Co. and the Nescopec Coal Co., and was at one time a member of the wholesale firm of Whitney, McCreary & Kemmerer. He also served five terms as a member of the United States House of Representatives. Twenty-five years ago following the defalcation of an official he revised the financial system of Philadelphia, at the same time turning into the treasury over $70,000 in fees which had accrued to the position in addition to the salary. His action in regard to the fee system was followed by the State Legislature enacting laws eliminating this feature of the administration of city offices. He was also at the time of his death a director in the Market Street National Bank. Despite his varied business activities he was deeply interested at all times in charitable objects and was long noted for his generous philanthropy.

INDUSTRIAL NEWS

Buffalo, N. Y.—The Buffalo & Susquehanna Railway, extending from Buffalo to Wellsville, N. Y., is to be sold at public auction at Buffalo on Aug. 23.

Philadelphia, Penn.—The "Franklin," the first of six steamers being built for the Coastwise Transportation Co., for the purpose of engaging in the coal trade, will be launched in about a week. This boat will be followed by the "Plymouth" in three weeks, with the other four to take the water as rapidly as possible.

London, England—According to an order in council issued Aug. 3, after Aug. 30 British coal cannot be exported except to British possessions and protectorates. The export of coal has heretofore been confined to British possessions, and to countries which are allies of Great Britain. The present ruling eliminates all of these allies.

Buffalo, N. Y.—August G. Gutheim, special examiner of the Interstate Commerce Commission held a hearing in Buffalo on July 27 on the complaint of the Buffalo Union Furnace Co. and the Wickwire Steel Co., made against the Buffalo & Susquehanna Ry. Co., claiming that discrimination has been made against them by the road in favor of the Rogers-Brown Iron Co., in that they are obliged to pay 40c. a ton more for coke brought over the road from the ovens at Tyler and Sykes on the line of the road and 50c. a ton more for carrying pig iron than is charged the Rogers-Brown Co. The amount claimed is $200,000 by the Union Furnace company and $125,000 by the Wickwire company.

Hazleton, Penn.—Eleven years ago when the Lehigh Valley Coal Co. took over the Coxe mining interests in this district the purchase carried with it the Delaware, Susquehanna & Schuylkill R.R. The property was transferred to the Lehigh Valley R.R., which company in a short time practically abandoned it. However, it now develops that the coal tonnage passing through this territory has increased so rapidly that the Lehigh Valley in seeking relief from congested traffic has decided to reopen the old D. S. & S. line and by this means divert the anthracite shipments from the Schuylkill district at Coxton, thus shortening the haul to the Lake ports on shipments that formerly were compelled to pass through this city.

Portland, Me.—Contracts have been let for the construction of a coal pocket on Long Wharf for the Pocahontas Fuel Co. The plant will occupy practically the whole area of the wharf which will be rebuilt. The reconstruction of the wharf has been given to Roy H. Beattie, Inc., of Fall River. The coal pocket will have a capacity of 7000 tons of bituminous coal while 20,000 tons additional can be stored on the wharf proper. The pocket, trestles, elevated railroad and office will be built by J. W. Gulliver of Portland. The hoisting machinery will be furnished by the Lidgerwood Machine Co., of New York City, and the cable-car machinery by the Exeter Machine Works, of Pittston, Penn. The plant will be capable of unloading coal from vessels at the rate of 400 tons per hour.

Denver, Colo.—The American Coal Refining Co. is erecting a plant at 7th and Wewatta St., Denver, to handle 500 tons of lignite slack per day and to derive therefrom numerous products. Charles O. Hoover, vice-president and chemist, is commercializing certain processes of his own devising whereby he expects to extract from the lignite a binding liquid to be used in briquetting the same coal. The plant is planned to also manufacture a fluid resembling gasoline, usable as a motor fuel, that will be placed on the market under the name of "coaline." Commercial gas is another product. C. V. Fisher, of Kansas City, Mo., is president; Schuyler C. Peck, of Denver, is secretary and W. J. Stevenson, of Kansas City, is treasurer. The main office is at 406 First National Bank Building, Denver.

Cincinnati, Ohio—The United States Circuit Court of Appeals has handed down its opinion passing upon a motion filed on behalf of the Hocking Valley and Chesapeake & Ohio railway companies, requesting the approval of a scheme devised by those companies for the sale of their coal properties in compliance with the decree of the court handed down in March. The decision tentatively approves the plan suggested, which contemplates the organization of new companies to operate the coal properties whose purchase price will be largely taken care of by securities to be issued and turned over to the railroads. October 9 has, however, been fixed by the court as a date upon which the Government may submit any objections it may have to any of the details of the plan. The court entered an order dismissing petitions filed recently by John S. Jones against the companies, alleging failure to comply with a contract involving the disposition of the properties at issue, as the decision covers the entire question of the proposed sale.

Denver, Colo.—The Denver & Rio Grande and the Cripple Creek district railways recently announced an increase in freight rates, to become effective July 26, on coal from the Cañon City field to Cripple Creek points. The increase proposed was 50c. per ton, making the freight $3. However, the state public utilities commission suspended this increase and it cannot become effective until the commission decides that it is justifiable which is improbable in view of recent refusals of the commission to accede to similar requests to increase rates on coal from the South Cañon and the Palisades districts in western Colorado to Denver and points east. The commission refused hearings in numerous other applications, but, because of peculiar features in these particular instances, hearings were granted. It appears that the Colorado & Midland R.R., through its general agent, opposed the increase requested by the competing road—the Denver & Rio Grande R.R.—and evidenced its readiness to haul coal from the western slope points at rates even slightly lower than those proposed by the commission, by reason of its shorter mileage. It was this point that decided the commissioners who believe that the complaining roads can still compete at a profit.

Philadelphia, Penn.—Judge J. Whitaker Thompson, in the United States District Court, has sustained the validity of three indictments against the Philadelphia & Reading Ry. Co. in which it is charged with having transported coal to New England ports via a barge line owned by the company and for which it had not posted rates of freight, in violation of the inter-state commerce law. This decision is considered of great moment, as it indicates for the first time, it is claimed, the powers of a Federal Grand Jury. The indictments were first returned last December, when the Grand Jury subpoenaed officials of the railway to appear before it with their books, without any charges having been preferred against the company. The hearing was held in secret and following the information then elicited the indictments were returned. The company on an appeal succeeded in having these indictments quashed, its contention being that two stenographers had been present in the jury room in violation of the law. However, the Grand Jury at the March term reindicted the company, and the hearing just held was based on the indictments of the March jury. It is stated that the Government has brought the suit in order to obtain equal rates for independent shippers of coal via water to coast points, particularly the New England States. At the trial, the date of which has not as yet been fixed, the Government attorneys will endeavor to prove that the barge or towing lines come within the jurisdiction of the inter-state commerce commission and that the tariffs should, therefore, be filed for the inspection of all interested, as they allege the rates at the present time are secret and discriminatory as applied to other than socalled favored mining companies.

St. Louis, Mo.—The Missouri & Illinois Coal Co. filed suit in the St. Louis Circuit Court, July 28, against the Willis Coal & Mining Co. for $85,965.80 alleged to be due the Missouri & Illinois company under alleged verbal contracts. The petition recites that both companies own mines at Willisville, Ill., on the Mobile & Ohio R.R., and that in November, 1903, a verbal agreement was entered into for the Willis company to supply two-thirds of the railroad company's needs and the Missouri & Illinois company the other third. The Willis company was to contract in its own name and collect from the railroad company the price agreed upon and pay over to the Missouri & Illinois company for the coal delivered by it, the exact price paid by the railroad company to the Willis company. It is alleged that the verbal agreement was renewed from time to time and coal was furnished by the Missouri & Illinois company to the railroad company, under different contracts at prices ranging from 94½c. a ton to $1.12 a ton, between Apr. 1, 1904, and Oct. 30, 1914. The petition states that the Missouri & Illinois company did not become aware until Jan. 1, 1915, that the Willis company had not paid over to it all the money received from the railroad company for coal furnished by the Missouri & Illinois company. The claim of this firm is that it received $85,965.80 less than it was entitled to under the verbal contracts. In a previous suit, decided adversely to the Missouri & Illinois company, it sought an accounting. The Willis company contends that it did not agree to give the Missouri & Illinois company the price obtained from the railroad company. The Missouri & Illinois company has also filed in the United States District Court a suit against the Willis company and the Mobile & Ohio R.R. Co., under the Sherman anti-trust act, asking $450,000 damages on the ground of alleged conspiracy to monopolize a part of the coal trade.

Coal Trade Reviews

General Review

Anthracite continues heavy though operations are increased. The boom in steel and the new restriction on British exports are the predominating features in the bituminous situation. Less favorable crop outlook a depressing factor.

In spite of the fact that the anthracite demand has disappeared almost completely and the storage depots are generally choked with coal, some of the larger hard coalers have been able to increase their operations to practically full capacity for the time being, at least. An almost unprecedented dullness prevails in all branches of the trade, but this lack of buying will cause a tremendous rush when the fall trade opens up, and it is probable that operations are already being tuned up in anticipation of this. In the meantime the individuals are slashing the prices down to the full April circulars, and even occasionally offer still further inducements.

The tremendous boom in iron and steel has had a mildly stimulating effect upon the bituminous market, although not of sufficient proportions to relieve the pressure. Manufacturing plants have been pressed to accept so much coal throughout the season that they are not able to absorb much more. The most encouraging aspect of the current situation is the belief that it certainly cannot become much worse. Prices are standing up well considering the stress, but occasional demurrage consignments force out some extremely low quotations.

The export trade continues the leader. Practically all the Atlantic coast piers continue breaking previous high records month after month in an unprecedented manner, but even the gross tonnage involved is so small as compared with the production of the country, that it is hopeless to anticipate any general relief in this direction. The new British order prohibiting exports to their allies promises to throw a heavy extra demand on this country.

With the steel mills in the Pittsburgh district taking their maximum quota of coal, there is a better sentiment prevailing in the trade though this has not been reflected in prices as yet. Coal on track seems to be fairly well cleaned up, and with the heavy export movement from this district, the market should be fairly well sustained if operators do not crowd production too fast.

The only feature of interest in the Ohio market has been the inception of a state wide movement to promote the sale of the local product in preference to the West Virginia and Pennsylvania grades. The situation in the Ohio industry has become so acute as to elicit general concern on the part of the public and concerted action is being taken to relieve the distress developing in the mining regions. In the meantime the situation continues as discouraging as ever. Demurrage coal is forcing ruinously low prices while manufacturers are confining their purchases entirely to the spot market. Prices are generally so uncertain that the market is difficult to quote.

Uncertainties over the crop outlook in the Middle West, together with indications that production has been speeded up ahead of the absorptive power of the market has caused a general hesitancy throughout that section. Some demand for stocking purposes is appearing, but this business is much behind normal, and indications point to a congestion this fall. Confidence is still expressed over the future outlook, but it is noted that the agencies are displaying less assurance than formerly.

A Year Ago—Anthracite operations heavily restricted. European war disrupts routine business on the Atlantic seaboard. Market technically strong but subject to many disturbing influences. Middle Western situation improving.

BUSINESS OPINIONS

Boston News Bureau—One is obliged to diagnose the situation differently than in normal times. Somehow we seem to be in a period when it is unsafe to predict anything. Operating forces are largely in the nature of surprises. The minds of practically everybody are fastened on the European map. This country is deriving enormous advantage from the necessities of Europe. Money remains abundant and credit everywhere is free.

Iron Age—Pig iron, after being in a rut for months, while steel has been active at advancing prices, has started in the past week on what promises to be an important movement. Prices in all districts are up 25c. to 50c., and the sudden appearance of inquiry from many sources indicates an effort of consumers to forestall a long delayed rise. The country's July pig iron production was 2,563,420 tons, against 2,380,827 tons in June. The steel companies are now close to their maximum pig iron capacity. In only four previous months—January, February, April, and May, 1913—was the production of steel works furnaces greater than last month's. In steel products the week has been quieter. Most domestic consumers are apparently covered for several months and there is little or no protective buying.

Am. Wool and Cotton Reporter—Good wools are becoming rather scarce. Domestic wools are now more in demand than the foreign wools. There is more call for territorial wools than for fleeces or scoured wools. Further indication of increased activity in the goods market is reflected. In the woolen and worsted goods market the main feature in the situation is the satisfactory trade in staples.

Dun's—Important strides toward commercial and financial supremacy have been made by the United States during the year of war that has caused incalculable losses in Europe. Though there are still some drawbacks, such as the abnormal shipping situation, American enterprise is steadily reaching out to new goals, and confidence in the future is expressed on every hand. Bountiful grain crops seem assured, and these will be sold at remunerative prices.

Dry Goods Economist—Although no marked improvement has been noticeable during the week in business generally, the underlying conditions are stronger than they have been for some time and there is a quiet feeling that from now on business will steadily increase in volume. This feeling is all the more intensified by the fact that various local strikes, which at first looked very serious, have now been amicably settled.

Bradstreet's—Activity in iron and steel, continued improvement in industrial operations, diminished idleness, a quieter labor situation, a steady flow of orders for munitions of war, ease in money, some improvement in collections, fine crop news, and growth in optimism as to excellent business this fall, stand out in marked contrast to reports of midsummer quiet in trade circles and of slackness in industries not depending upon war orders.

Marshall Field & Co. — Weather conditions have been a serious handicap to dry goods distribution during the week, and wholesale shipments show a decrease as compared with those of the same week a year ago. Retailers, however, have visited the market in larger numbers than during the corresponding week last year. Collections are normal.

Southern Lumberman — While the volume of hardwood business done in July was little if any in excess of that of either of the two preceding months, the end of the month finds the market steadier and in somewhat better condition in numerous ways.

Armour & Co. — General trade continues to improve; increased activity in all industrial lines manifests itself. The Steel industry is on a sound footing; large number of men being employed, and the number being steadily increased; eastern plants working at maximum capacity and, in many cases, unable to meet demand; prices rising and firm.

ATLANTIC SEABOARD

BOSTON

Pocahontas and New River market druggy but no significant change in f.o.b. quotations. Occasional market cargoes serve to keep delivered prices down to minimum. Georges Creek plentiful and Pennsylvania grades continue very dull. Anthracite orders few and far between.

Bituminous—There is no significant change in prices f.o.b. Hampton Roads, although with all grades of Pocahontas and

New River trade is very light. Receipts on contract are relatively small and there are practically no current sales. Exports are still the mainstay of the market and while coal with individual shippers may be temporarily in short supply it is because output has been held down closer to the demand than was the case earlier in the season.

Occasional market cargoes have appeared the last week or so and some extremely low prices on cars are the result. While there is the chance of this as a factor in the trade there is little hope of improvement for a long time to come. Plants have been so pressed to accept deliveries the whole season through that they will make room very slowly. The textile mills usually make August a light month.

Georges Creek is coming forward freely on contracts and ample supplies are now available. The amount of foreign tonnage reporting for loading at Baltimore has sagged off materially, although this is regarded as only temporary. The shippers of the Pennsylvania grades are nearly all pressed with coal standing at the piers. Shipping orders are hard to get, even on good-sized contracts, and there will have to be a material curtailment to avoid lower prices. Several options for comprehensive tonnages to foreign buyers have not been exercised and the prospect is for dull business at least until September.

Water Freights—There is still an abundance of barge and steamer tonnage for what little business is offering. Rates, however, show no pariticular weakening. Sailing vessels are practically out of the market except for small coasters out of New York and Philadelphia. Freights offshore are still attractive enough to draw from the coastwise trade almost every sailing vessel over 700 to 800 tons; 75c. to Boston, 3000 tons upwards, is about the current quotation from Hampton Roads.

Anthracite—Trade is still very quiet. Some large discounts on egg and chestnut have been made by individual shippers; on chestnut as much as 50c. less than the company price has been reported in several instances. Orders are scarce but not unusually so for the time of year.

Prices on bituminous at wholesale are about as follows:

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines*	$0.85@1.40	$1.15@1.60	$1.67@1.77	
Philadelphia*	2.10@2.65	2.40@2.85	2.92@3.02	
New York*	2.40@2.95	2.70@3.15	3.22@3.32	
Baltimore*	....	....	2.85@2.95	
Hampton Roads*	....	....	....	$2.65@2.80
Boston†	....	....	....	3.50@3.63
Providence†	....	....	....	3.45@3.68

* F.o.b. †On cars.

PHILADELPHIA

Anthracite shows slight improvement but is still extremely dull. Stove and egg in best demand, with chestnut the heaviest. Pea slightly stronger. Collections exceptionally bad. Midsummer quietness prevails in the bituminous trade. Steel boom being felt.

Anthracite—The slightly improved condition of the market as noted last week has continued but is only noticeable in the business of the large companies which advance prices on the prepared sizes each month. These companies produce the well known and standard grades that are always in demand and the dealers have placed quite a few orders this week to save the 10c. advance on Aug. 1. As a result of this improvement the Lehigh Valley, Reading and Lehigh Coal & Navigation collieries are working six days a week.

The individual shippers are offering any quantity of the prepared sizes at the April prices, and in a few instances where the order was made to carry chestnut even those figures were slightly shaded, probably by absorbing the tax. Chestnut size continues to give great concern as to its disposition.

Stove coal is the most active and is even occasionally scarce. Egg is also fairly active, but there were plenty of individual offerings of this size well off the current circular. Pea coal is still low in price, although the extremely low prices that have been prevalent were not so much in evidence this week, quotations ranging from $1.75 up to not more than $2 on the better grades. As indicative of the dealers' attitude toward the price on pea, one of the retail companies which was awarded a good portion of the school contract offered an individual operator $1.35 for 5000 tons of pea.

The poor collections continue and those most concerned with this end of the trade seem more worried about this feature of the market than any other. This applies to the wholesaler as well as the retailer. No retail dealer seems to have collected anything like a fair proportion on his spring deliveries and he in turn is naturally deeply indebted to the shipper. The opinion is that it will take some drastic movement like a strike or a long suspension to straighten out the market and stiffen prices.

With the worst month gone August can be looked forward to produce at least a slightly better tonnage. There are quite a few dealers who have not laid in any stock yet and who always linger along until this time so as to extend the time of payment of bills into the fall, until they can make some sales and thus do business practically on the shipper's capital.

Following their usual custom the large operators have issued their August price circular this week, increasing the prices on the prepared sizes 10c. per ton as shown below, to which should be added the Pennsylvania State tax of 2½%:

	Line	Tide		Line	Tide
Broken	$3.40	$4.55	Pea	$2.50	$3.25
Egg	3.65	4.80	Buckwheat	1.25	2.25
Stove	3.90	4.80	Rice	.85	1.75
Chestnut	4.05	5.05	Barley	.50	1.50

Bituminous—While the bituminous trade has been exceptionally dull for a long period, the feeling is that it cannot be any worse with the passing of July which is usually the dullest month of all. The last week showed an improvement due to the boom in the iron and steel trade, particularly those plants that have been waiting for the completion of additional buildings. The betterment has not been reflected in any increase in prices as yet. The tide shipments are good; in fact the July tonnage has broken records, being almost three times that for the same period last year, with prospects for an even better trade when additional ships are available. The prevailing prices are as follows:

Georges Creek Big Vein	$1.65@1.75	Fairmont gas, mine-run	$1.15@1.25
South Fork Miller Vein	1.50@1.60	Fairmont gas, slack	.65@ .75
Clearfield (ordinary)	1.00@1.20	Fairmont lump, ordinary	.85@ .95
Somerset (ordinary)	1.00@1.15	Fairmont mine-run	.75@ .80
West Va. Freeport	.85@ .95	Fairmont slack	.45@ .55

NEW YORK

Bituminous situation slightly improved. Spot demand better. Gas coal for South America. Export demand good. Anthracite market dull.. Individual coals at concessions.

Bituminous—Some dealers say there has been a slight improvement in the bituminous situation, but the majority believe the market shows no change. The demand seems slightly stronger and the prospects for a heavy fall business are good. Spot coal is still plentiful but there are not as many loaded bottoms as a week ago. Many contract holders are in the market for bargains and other large consumers who refused to sign up last spring are buying from hand to mouth, believing they will be able to get a sufficient supply as needed.

The mines as a rule are working on about a four-day-a-week schedule, although those producing the higher grades are doing better. By September dealers look for higher prices and a scurrying among large consumers with no contracts. Contract coals continue to move readily.

In the local harbor sufficient coal remains to supply all immediate wants. Occasionally it has been possible to pick up good bargains. Western Maryland has been quoted at from $2.30 to $2.35.

The export situation remains strong. Some contracts are about completed for shipments of gas coal to South America and it is reported that at least one New York house has about closed a contract with the Russian Government for a good sized block of coal. A detriment to the development of the foreign trade at present is the high freight rates.

Current quotations are on the following basis:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.30@3.40	$3.30@3.40	$3.30@3.40	$1.75@1.85
Georges Creek Tyson	2.90@3.00	2.90@3.00	2.90@3.00	1.35@1.45
Clearfield:				
Medium	2.65@2.80	2.55@2.65	....	1.10@1.25
Ordinary	2.55@2.60	2.55@2.60	....	1.00@1.10
Broad Top Mountain				1.10@1.45
Cambria County:				
South Forks	2.90@3.05	....	....	1.35@1.50
Nanty Glo	2.75@2.80	....	....	1.20@1.25
Barnesboro	2.65@2.70	....	....	1.10@1.15
Somerset County:				
Quemahoning	....	2.70@2.85	2.70@2.85	1.20@1.30
Medium	2.65@2.70	2.60@2.65	2.60@2.65	1.10@1.15
Latrobe	2.45@2.55	....	....	.90@1.00
Greensburg	2.75@2.80	....	....	1.10@1.15
Westmoreland	3.15@3.20	....	....	1.35@1.45
West Virginia Fairmont ¾		2.60@2.70	2.60@2.70	.80@ .90
Fairmont mine-run		2.50@2.60	2.50@2.60	.70@ .80
Steam		2.45@2.50	2.45@2.50	.90@ .95
Western Maryland		2.35@2.40	2.35@2.40	.80@ .85

Anthracite—Demand for prepared coals at Tidewater seems to have nearly disappeared and in the line trade all yards are reported filled. The expected rush the last week of July did not materialize and the new month has started out very quietly.

Independent coals continue to flood the market and has resulted in big concessions to bargain hunters. Quotations on individual coals have remained practically the same for two months and the opening of the new month sees no change. Everybody looks for a busy fall and winter. Retailers say they have enough orders on their books to keep them busy during September but that they cannot deliver any of the coal until ordered.

Of the prepared sizes stove is the strongest and nut the weakest. Pea is long and some good bargains have been reported. The buckwheat coals do not seem to be so plentiful but there has been no improvement in prices.

Current quotations follow:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$4.95		$5.00	
Egg	5.20	$4.70@5.20	5.25	$4.75@5.25
Stove	5.20	4.70@5.20	5.25	4.75@5.25
Chestnut	5.45	5.00@5.45	5.45	5.05@5.50
Pea	3.50	2.70@3.00	3.55	2.75@3.05
Buckwheat	2.75	2.00@2.25	2.80	2.05@2.30
Rice	2 25	1.70@1.85	2.30	1.75@1.90
Barley	1.75	1.45@1.70	1.80	1.50@1.75

BALTIMORE

Coal Men more optimistic as tonnage movement and demand improve. Exports keep up and prospects for record-breaking period are bright.

From the mining sections of western Maryland, West Virginia and Pennsylvania come reports of increasing activity at producing points; that the movement for August will greatly exceed that of July is generally conceded. Many big plants are now working day and night on war orders of various kinds, and this is being felt along other lines of activity. Money is growing a little easier, and there are some who now believe the demand may be such as to tax the capacity of the mines before long.

While better grade coals are being held more closely the poor to ordinary fuels are still offered at very low figures. Lower-grade steam coals of Maryland and West Virginia are going at 75 to 85c., and run-of-mine gas is easy at 80 to 85c. Ordinary Pennsylvania grades are offering at 90 to 95c.

During the past week the coal-export movement took another jump. With a total of 65,484 tons of cargo coal exported for the last six working days of the month, the official total when issued will probably show between 232,000 and 235,000 tons loaded here for foreign ports for the month. With many charters announced or pending for August and September many persons are looking for a record-breaking coal movement on foreign account during those months.

Anthracite men are making spasmodic deliveries on early summer orders, but the whole of that field is extremely quiet. All sizes are in easy supply. A word of warning is being sounded quietly by some of the coal men regarding the possibility of strike troubles with the end of the agreements in the spring.

Tide prices on anthracite f.o.b. vessel, Baltimore, Md., are as follows:

Broken	$5.10	Nut	$5.60
Egg	5.35	Pea	3.85
Stove	5.35	Buckwheat	2.60

HAMPTON ROADS

Heavy export shipments continue. Italy still taking large quantities. Prices stationary. July dumpings reach million and a half tons.

The week's coal shipments from Hampton Roads ports have been heavy and a large percentage of the movement has been to foreign markets. Italy is still receiving a large portion of the export coal from this port. The largest single cargo of the week went to Cristobal, Canal Zone, being loaded into the collier "Achilles" and amounted to 12,000 tons. The cargo to Rotterdam was large, amounting to 8000 tons, and is particularly interesting from the fact that very little coal is shipped from Hampton Roads to Dutch ports.

There is little free coal at Tidewater at this time; practically all of the shippers are pushed for coal to take care of vessels in port and about due. Prices remain stationary and it is not believed that even with the heavy demand that there will be any increase.

The dumpings for the month of July will be around a million and a half tons; on the morning of July 31 the Norfolk & Western at Lambert Point had gone over 800,000 tons, the Chesapeake & Ohio Ry. at Newport News over 429,000, and the Virginian Ry. at Sewalls Point about 300,000 tons. This will therefore make the month of July break all previous records at Hampton Roads and prospects are even now bright for August to exceed the July movement.

Railroad Tonnages—Dumpings over the local piers for the past several weeks compare as follows:

	Week Ending				
Railroad	July 3	July 10	July 17	July 24	July 31
Norfolk & Western	211,017	174,822	180,090	197,913	188,593
Chesapeake & Ohio	83,678	76,397	116,862	96,627	84,018
Virginian	58,455	57,467	78,710	86,523	39,335
Totals	291,828	308,686	375,662	381,063	311,946

OCEAN FREIGHTS

A number of large British steamers were offering last week at $8.28 for coals to Lower Plate ports, at which rate a few of these steamers were chartered, but neutral tonnage is difficult to obtain for this voyage even at $8.40. Mediterranean freights are firmer, owing to the competition of grain, which is now actively in the market, and rates to Cuban and West Indian ports are also firmer, on account of the limited supply of tonnage available for these trades.

To	Rate	To	Rate
Havana	$2.25@2.75	Bermuda	**$3.00**
Cardenas or Sagua	3.00@3.50	Vera Cruz	3.25@3.75
Cienfuegos	3.00@3.25	Tampico	3 25@3.75
Port au Spain, Trinidad	3.50	Rio	8.40@8.64
St. Lucia	**3.25@3.50**	Santos*	8.40@8.88
St. Thomas	3.00	Montevideo	**8.22**
Barbados	**3.50**	Buenos Aires or La Plata	†**8.28**
Kingston	2.75@3.00	Rosario	8.64@8.88
Curacao	**3.25**	West Coast of Italy	9.12@9.60
Santiago	2.75@3.25	Barcelona**	8.40@8.88
Guantanamo	2.75@3.25	Valparaiso or Callao	6 25@6.50
Demerara	4.25@4.50	Marseilles	8.64@9.12

Note—Rates noted in **bold face** type are only approximate.

* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British tonnage. Rate on neutral tonnage to Montevideo, Buenos Aires or La Plata about $8.40. Neutral owners prefer Buenos Aires.

W. W. Battie & Co.'s Coal Trade Freight Report.

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge. 24c. per net register ton per day demurrage."

VESSEL CLEARANCES

The following steamers have cleared from Hampton Roads July 24 to 31, 1915:

NORFOLK

Vessel	Destination	Tons
Marosa	Rio de Janeiro	2167
Walden Abbey	Rio de Janeiro	2868
Peitro	Leghorn	5155
Wellington	Genoa	8231
Romford	Port Castries	4500
Denwell	Buenos Aires	4400
Brendon	Dakar	6800
Cotomba	Porto Ferrajo	4700
Marcus L. Urann	Rio de Janeiro	5000
Achilles	Cristobal	12,000
Rothley	Montevideo	5604
Antiope	Buenos Aires	4077
Clarissa Radcliffe	Genoa	8687
Wm. C. May	St. Michaels	1088
Aboukir	Antofagasta	5900
Wegadesk	Cristobal	6500

NORFOLK

Vessel	Destination	Tons
Kiki Issaia	Colamata or Syra	4404
Antonios Mavrogordatus	Genoa	5453
Chincha	Iquique	1695
Andreas Grakis	Spezia	4319

NEWPORT NEWS

Vessel	Destination	Tons
Lucy Neff	Santiago de Cuba	1050
Lindenhall	Spezia	6100
Ilva	Porto Ferrajo	2600
Petritsis	Maddalena	5434
Soestdijk	Rotterdam	8000
Antonietta Accame	Spezia	3822

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	To	Tons	Rate
R. P. Murphy	Mayaguez	572	$2.85
Millicent Knight	Mediterranean	2302	
Sif	Martinique	1959	
Alice M. Colburn	Porto Rico	2400	
Dionyssias Stathtas	Barcelona	2296	
William Booth	Calais, Me.	825	1.32
Horace A. Stone	Porto Rico	1237	

BALTIMORE

Vessel	To	Tons	Rate
Framlington, Ct.	River Plate	2592	
Argo	River Plate	1970	
Mar Caspio	Barcelona	1632	
Kaupanger	Malmo	2104	
Grekland	Stockholm	1671	
New Sweden	Sunsvale	3287	
Hogland	Stockholm	2582	
Artemis	Gothenburg	3062	
Salamis[1]	Italy	2307	$8.64
Jersey City[1]	Italy	2955	9.48
Cloutsham	River Plate		
Riverdale	Guayaquil	2752	
Nogo	Montevideo	3953	
Exford	France	7239	
Framling, Ct.	Argentina	5800	
Ubbergen	Costa Rica	3000	

BALTIMORE—(Continued)

Vessel	To	Tons	Rate
Claveresk	Cuba	6100	
Grekeana	Sweden	5000	
Carolyn	Galveston	1414	
Nea Hellas	Piraeus[2]	2267	9.36
Calimeris	Italy	2224	8.64

[1] Or Virginia [2] Or Syra

VIRGINIA (Including Hampton R'ds)

Vessel	To	Tons	Rate
Deddington	Campana[1]	1806	$8.28[2]
Alcana	La Plata	2246	8.28
Rothley	Buenos Aires	2487	8.28
	Daker	2804	8.64
Salamis[3]	Italy	2307	8.64
Republic	Pernambuco	(80	7.75
Vasilefs Georgios	River Plate	2382	8.16
Jersey City[3]	Italy	2955	9.48
Nailsea, Ct.	Buenos Aires	2152	8.28
Ribe	Rio Grande	1405	10.08
Brendon	Daker		
Wegadesk	Colon	2388	
Ludgate	Campana[1]	2390	8.25

[1] Or Villa Constitucion [2] Option Rosario $8.52 [3] Or Baltimore

ATLANTIC RANGE

Vessel	To	Tons	Rate
R. B. White	Charlottetown	411	

Note—Steamers are indicated by **Bold face type**, all others being schooners.

LAKE MARKETS

PITTSBURGH

Conditions not materially improved but sentiment much better. Export demand for Connellsville coal improved. Operations at 50 to 55% of capacity.

On the whole, there is no improvement in the coal situation in the Pittsburgh district, but there has been a decided improvement in sentiment, and much stronger hopes are expressed that there will be a marked improvement before the Lake shipping season closes. The steel industry is now taking very nearly its maximum quota of coal, as the mills in the Pittsburgh district are operating very nearly at capacity, though their tonnage output and consumption of coal are not as large as they would be in cooler weather with the same equipment nominally in operation.

Shipments in the Lake trade continue light, and the sharp increase that was expected for August is as yet showing little signs of materializing. Export demand continues to increase, and the Connellsville district operators are shipping larger tonnages than ever. Five of the largest mines of the Monongahela-Pittsburgh-Westmoreland Coal Co. were ordered on full time to fill exceptionally large export orders. Slack maintains the firmer level recently quoted, production being light for this time of year and demand fairly adequate.

Prices for free coal are not quotably changed and stand as follows: Slack, 50@55c.; nut and slack, 90@95c.; nut, 95c.@$1; mine-run, $1@1.05; ¾-in., $1.10@1.15; 1¼-in., $1.20@1.25, per net ton at mine, Pittsburgh district. On contract to Apr. 1 prices are a shade firmer than for free coal, mine-run being available at $1.05@1.15. Pittsburgh district operations remain at an average of 50 to 55% of capacity.

BUFFALO

Bituminous still improving and slack about normal. Outlook for a good fall trade ahead. Anthracite not moving yet, but expected to early in fall.

Bituminous—A better volume of trade is reported, with good prospects of plenty to do by fall. The best feature is a larger demand for slack, which has advanced to a profitable level. If the Lake trade should become active the situation would be fairly good, so far as the volume of business is concerned, though it is not likely that the prices will advance. Some jobbers who have often been buried in coal that they could not sell at any price are now reporting that they have not a single car on track and that there seems likely to be demand for all they get from this time on if the mines do not crowd the production too much.

The improvement naturally follows the stir in iron and this promises to continue. The Lackawanna Steel Co. reports that it has orders three months ahead and other concerns are also quite active. While there is no real advance in prices the market is much firmer, and there is no further report of badly cut prices to move stranded shipments. Quotations are steady on the basis of $2.70 for best Pittsburgh lump, $2.55 for three-quarter, $2.45 for mine-run and $2.25 for slack.

Anthracite—The trade has not improved. There was some expectation of the usual small spurt at the end of the month, but the increased demand was not large. It is the idea of certain shippers that the spurt at the end of August will be quite large and that the demand will then continue through the fall, and culminate in a big rush by early winter. Shipments by Lake are much smaller than a year ago, on account of the filling up of the Upper-Lake docks. The amount loaded for the week was 102,600 tons and for July,449,012 tons, as against 810,410 tons in July last season and 1,869,390 tons for the season, as against 2,219,735 tons to August last season.

TORONTO, CAN.

Plentiful supplies and market continues dull.

Trade continues very dull, buyers as a rule only ordering for immediate requirements. There are full supplies on hand in all lines and but little coal coming forward, as nearly all the yards are stocked up to full capacity. There has been no change in prices, which are likely to continue as at present until September, when the usual advance in anthracite is anticipated. Quotations for best grades are as follows: Retail, anthracite egg, stove, and nut, $7.50; grate, $7.25; pea, $6. Bituminous, steam, $5.25; screenings, $4.25 to $4.50; domestic lump, $6; cannel, $8. Wholesale f.o.b. cars three-quarter lump, $3.56; screenings, $2.90.

TOLEDO

Lake movement light at Toledo.. Market fails to show any improvement otherwise. West Virginia grades in best demand. An acute situation developing as regards the Ohio industry.

The trade is showing a moderate improvement and prices are holding fairly close to list. The Lake trade has not shown much increase and steam coal is not particularly firm. Domestic grades are better and are expected to improve from now on. Pocahontas continues very firm although there seems to be a trifle better supply. Anthracite is selling off the list here which is most unusual. Steam coal of all kinds is slow and prices are weak. The threshing season is late owing to wet weather and this has delayed the demand from this source. Stocking will begin within a short time now which will give some impetus to the trade. Contracts are not being made very freely, many concerns which usually have their contracts all closed up by this time now buying bargain coal off the tracks.

Ohio operators declare that it is impossible to compete with West Virginia under present operating and traffic conditions. Ohio miners are actually suffering from lack of work and following the Governor's call for financial assistance for the miners and their families a "Buy Ohio Coal" campaign was started at Athens and is gradually spreading over the state. It is hoped this will improve matters somewhat but Ohio operators feel that the lawmakers and public opinion must straighten out the tangle if Ohio mines are again to be operated.

COLUMBUS

Slight improvement in the domestic trade. Steam business is still slow. Production at a low ebb.

There has been a fairly steady demand for domestic sizes for stocking purposes, but the volume of business is hardly equal to that of former seasons. The tone of the market is not very good and the trade is playing a waiting game.

Stocking of Pocahontas and West Virginia grades is the best feature at the moment. There is a fairly good demand for Pocahontas, due to the increase of 25c. per ton on Aug. 1. White ash and other West Virginia grades are also moving fairly well. It is still too early for any extensive movement of Hocking, although some is being purchased by dealers. On the whole, the stocks in the hands of dealers are not as large as usual at this time of the year. Retail trade is fairly brisk, especially to householders. There appears to be a better demand for anthracite than ever before.

Steam trade is still dull and there is no immediate hope for improvement. Manufacturing plants are only buying from hand to mouth and are apparently loath to accumulate stocks; much of this buying is in the open market. But few contracts are expiring and the work of renewing is difficult. Railroads are using only a fair amount of fuel.

Lake trade is still dull in every particular. Reports from the Northwest show that there is a considerable tonnage on the docks of the Upper Lake ports and the movement to the interior is slow. The Sunday Creek Coal Co. has not started Lake shipments and may not ship any Lake coal at all this season.

Prices are being fairly well maintained in the retail field despite the depression. Dealers are not inclined to sacrifice profits for business. Some cutting is reported but not sufficient to demoralize trade in the least.

Prices in Ohio fields are as follows:

	Hocking	Pomeroy	Kanawha	Eastern Ohio
Rescreened lump	$1.50	$1.55		
Inch and a quarter	1.35	1.35	$1.30	$1.25
Three-quarter inch	1.25	1.25	1.25	....
Nut	1.15	1.25	1.15	....
Mine-run	1.05	1.10	1.05	1.00
Nut, pea and slack	.65	.70	.65	.60
Coarse slack	55	.60	.55	.50

Mines have been working at about the following percentages of full capacity.

District	Week Ended July 10	July 17	July 24	July 31
Hocking	20	25	25	15
Jackson	15	25	20	20
Pomeroy	45	40	40	35
Crooksville	30	20	20	20

District	Week Ended July 10	July 17	July 24	July 31
Cambridge	25	35	25	30
Masillon	25	30	25	25
Eastern O.	60	50	55	50
Average	31	32	30	29

CLEVELAND

Eastern Ohio slack and other Ohio fine coals are selling at $1.55 to $1.65, largely because of the contracts closed the last few days. Pennsylvania grades are not quite so strong.

In the last few days a number of Ohio furnaces have closed for their requirements at 75c. for No. 8 slack at the mines. The National Tube Co. at Lorain, Phillips Sheet & Tin Plate Co. at Canton, La Belle and Cambria at Steubenville and Mingo Junction, Carnegie Steel Co. and others have contracted. Excepting the Lorain contract the freight rate is 25c. a ton.

This has taken all the No. 8 slack that is being produced and to give any one else coal the operators must spread it over their trade on a proportionate basis as the steel companies could use more than they are getting. As a result of these contracts No. 8, Middle district and Goshen fine coals are worth $1.55 to $1.60 at Cleveland. Fairmont is on about the same basis while Pan Handle is worth only $1.50 and Youghiogheny, $1.60.

The coarse coal market is unchanged and the market for Lake coal is very quiet. Lake coal shipments are at the low point of the last month with no improvement in sight for at least another month. Pocahontas lump and egg are firmly held at $3.70 delivered at Cleveland, with mine-run at $2.70, though not particularly firm.

CINCINNATI

A shorter car supply and the advancing season furnish some ground for hope of a better market, but demand continues extremely dull. Price concessions are common.

There has been some demurrage coal on the local market during the past week, which is rather unusual at this season. There are some hopes that the beginning of the end of the unprecedented slump is at hand, as the first of August should certainly bring some buying while reports of car shortage at several points indicate that there may be some trouble in taking care of a normal movement later on.

With prices completely demoralized, however, it is difficult to quote the market. Some of the larger retail concerns are putting in their usual supplies at their regular prices, but the smaller retailers, especially out in the state, have suffered considerably from bad credits, and are not anxious to buy any more coal than they have to. The steam market, on account of the dullness in manufacturing circles, is not much, if any better off.

LOUISVILLE

Slight improvement in domestic coals but the general market continues heavy.

Some welcome improvement in the Kentucky coal market has been noted chiefly in the domestic line. The domestic demand has been late in developing and has not reached anything like the normal volume. As yet prices have shown no stiffening. Block coals of the better grade continue at from $1.25 to $2, those operators who are holding out for the top prices not selling as much as the others. Nut and slack range from 25 to 40 and from 50 to 60c. f.o.b. mines, according to grade.

BIRMINGHAM

Coal market improving and operations are much better.

Keeping pace with the improving iron market, the coal business in this district is in better shape now than it has been for at least twelve months. Indications point toward the last six months in this year showing an increase of at least 50% more than during the first six months. Many of the mines that have been closed down since early last fall have resumed. Orders are coming in better, and for larger tonnages, both on steam and domestic coal; as several of the furnaces in the district which have been out of blast for nearly a year are resuming operations, and the mines are running on an average of 4 to 5 days per week, with a few of them making six days. General conditions in iron and other products are better in every way, and conditions are apparently becoming normal.

COKE

CONNELLSVILLE

Small slump in prompt furnace. Market generally quiet. Wilpen coke works to resume. Production and shipments slightly decreased.

The coke market has been disturbed by a conjunction of unfavorable elements affecting the spot situation. Five or six consumers gave instructions for shipments to be curtailed on their contracts, just at a time when production by merchant ovens had been increased in expectation of heavier demand in the near future. As a consequence prices for spot furnace coke broke, and there have been free offerings at $1.60 while it is quite possible that an even lower figure could be done. The situation is tending to right itself as some ovens were put out last week. The recently advanced quotations on contract have not been realized, as demand on contract has been light, and some operators are ready to quote slightly less. The market stands as follows: Prompt furnace, $1.60; third-quarter furnace, $1.75; contract furnace to Jan. 1, $1.85@2; prompt foundry, $2.20@2.40; contract foundry, $2.25@2.60, per net ton at ovens.

The Shenango Furnace Co. is about to blow in an additional furnace at Sharpsville and will start its Wilpen coke works, in the Upper Connellsville or Ligonier district, containing 150 ovens. The plant has been shipping coal for export and will continue to do so.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended July 24 at 367,095 tons, a decrease of 4049 tons, and shipments at 360,852 tons, a decrease of 4763 tons.

Buffalo—The demand is much better than formerly and though it does not increase materially it appears likely to hold, particularly as the Lackawanna Steel Co. reports orders three months in advance and increasing. Ore movements by Lake are active. All reports from the coke-oven district agree that the output is now large, though it is feared that too many ovens will be put into operation before the market steadies down. Prices are strong on the basis of $4.25 for best Connellsville foundry and $3.30 for stock coke.

Chicago—Domestic sizes have been in better demand during the past week, with prices a little stronger. The general tone of furnace and foundry coke is steady. Quotations are as follows: Byproduct, $4.65@5.10; Connellsville, $4.75; Wise County, $4.65@4.75; gas coke, $3.75@3.90, furnace, $4.85.

MIDDLE WESTERN

GENERAL REVIEW

Sales slightly larger and prices a trifle stiffer. Domestic shipments increased. Screenings softer. Smokeless coals strong. Anthracite dull.

There has been no evidence of a heavier movement, and it is difficult among the conflicting reports to obtain a correct perspective of the immediate future. The production of coarse coal is increasing so that there are more screenings thrown on the market than can be readily absorbed. City retail yards are still buying sparingly, and the increased shipments have mostly gone into the country districts for threshing purposes. Several contracts have been placed by local retailers during the last week, with deliveries to be made later in the season.

The general opinion is that production has been speeded up ahead of the demand. The movement of tonnage in July did not come up to expectations. Illinois screenings are quoted as low as 60c. with Indiana Fifth and Sixth Vein at 65c., Fourth Vein at 80c., and it is felt that the decline has not been checked. The industrial demand grows very slowly, and evidently there are not enough orders from this source to absorb production of steam coals. Lake shipments are slowly increasing, but the tonnage moved is falling considerably behind previous seasons and there are little hopes for any material improvement until the latter part of the current month at least.

CHICAGO

Market hesitating due partially to uncertainty of crops. Prices generally well maintained. Several new advances in circulars Aug. 1. Higher anthracite freights to Western points.

Shipments to Northwestern points from Southern Illinois mines are being somewhat retarded on account of wet weather. The dealers do not wish to accept threshing coal until they are sure as to the result of the wheat crop, and many things can happen to prevent a large yield. Prices in the Northwestern markets range at circular quotations, or very close thereto.

The summer business in the Peoria district both from the retailer's and operator's standpoint has been very satisfactory so far; prices have been well held, and the larger industrial establishments have been running full time.

Southern Illinois screenings have been on the down grade but it is reported that $1.60 will be the minimum price on domestic lump this month. The demand for Harrisburg lump has been quiet, and steam lump from these mines has been moving very slowly. All Carterville coals have been in steady demand with prices well maintained.

In the Springfield district, domestic lump has been quiet with a steady demand for screenings at closer to list prices than for several weeks past.

The demand for Indiana domestic coals shows an improvement, but steam grades are moving unusually slow. Screenings from Third, Fourth and Fifth Vein mines in the Clinton and Knox County districts have been moving more briskly at fair prices, while there has been an accumulation of fine coal at Fifth and Sixth Vein mines in Sullivan County, and even at reduced prices screenings from these mines have been slow sale.

Smokeless products are very firm. On July 25 several large producing companies put the August schedule of $2.25 for lump and egg into effect. This new schedule has toned up the market for these grades and resulted in some orders before it became effective.

Pennsylvania smokeless prepared sizes, with the exception of egg, are in better demand at improved prices. Mine-run is quiet, and egg size is very slow.

Orders for Hocking domestic lump are coming in more freely, and jobbers report a better demand for all sizes in eastern Indiana and Ohio. Prices on 2- and 3-in. lump average between $1.35 and $1.60, with $1.25 to $1.50 for 1¼-in

Prices for Kentucky coals are still uncertain. The demand for block is very light, and all other sizes seem to be sold at any price to make a sale.

An advance of 25c. per gross ton occurred in the through rates on anthracite to Western points on July 17, and what effect this will have on future prices is questionable. There has been no rush of orders at the end of the month, and it looks as though the dealers have postponed most of their buying for another month. It is felt that the higher rates will mean an advance in the cost of coal delivered at Western points.

Quotations in the Chicago market are as follows:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump	$1.35@1.50	$1.35@1.50	$1.35@1.50	$1.35@1.55	$1.40@1.50
Steam lump	....	1.15@1.25	1.10@1.15	1.10@1.20	....
2½-in. lump	....	....	1.25@1.35	1.15@1.25	1.25@1.35
1¼-in. lump		....	1.15@1.20	1.10@1.20	
Egg	1.35@1.50	1.25@1.35	1.10@1.25	1.15@1.25	1.25@1.35
Nut	1.25@1.35	1.15@1.25	1.00@1.05	.95@1.05	1.15@1.25
No. 1 washed	1.50	....	1.45@1.50	....	....
No. 2 washed	1.40	....	1.35@1.40	....	....
No. 1 nut	1.50	....	....	....	....
No. 2 nut	1.35	....	....	....	....
Mine-run	1.10@1.15	1.00@1.10	.85@1.00	.90@1.00	.85@1.10
Screenings	.70@ .75	.65@ .75	.60@ .75	.65@ .80	.70@ .80

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.35@1.50	$1.25@1.90	2.00@2.10	$1.65@1.90	$1.35@1.60
1¼-in. lump	1.15@1.25	1.25@1.40	....	....	1.25@1.35
Egg	1.35	1.25@1.45	2.00@2.10	1.50@1.75	1.10@1.25
Nut	1.25	1.10@1.35	1.50@1.75	1.25@1.35	1.00@1.10
No. 1 nut	1.35@1.50	....	....	....	....
No. 2 nut	1.35		....	....	....
Mine-run	1.10	.90@1.15	1.25@1.35	1.10@1.25	1.00@1.05
Screenings	.70@ .75	.45@ .70	....	....	....

Receipts by Lake—Arrivals by Lake for the week to Aug. 3 and for the month and season to date were as follows:

	1915		1914	
From	Anthracite	Bituminous	Anthracite	Bituminous
Buffalo	9,000	......	14,259	......
Toledo	......	9,005	......	5,300
Ashtabula	......	......	7,200	......
Cleveland	......	7,981	......	6,751
Oswego	......	......	4,574	......
Erie	7,000	......	......	......
Conneaut	......	10,005	......	......
	16,000	26,991	39,378	12,061
August total to date	......	9,005	20,546	5,300
Season total to date	379,399	236,235	322,258	341,608

RECAPITULATION FOR THE MONTH OF JULY

	1915		1914	
From	Hard	Soft	Hard	Soft
Buffalo	73,123	......	93,277	14,560
Oswego	15,571	......	16,120	......
Ashtabula	12,844	2,400	14,400	......
Cleveland	......	26,094	......	6,761
Toledo	......	25,161	......	38,160
Sandusky	......	......	......	20,411
Erie	19,615	......	6,662	......
Conneaut	......	10,005	......	......
Totals	121,153	63,669	130,459	79,892

ST. LOUIS

Increased circulars became effective Aug. 1. Market otherwise dull. Consumers not stocking as much as normally.

August brought with it a marked advance in Williamson and Franklin county prices, with the latter the highest, and there are also changes in the quotations in other fields. Screenings remain low and the market is dull. Domestic orders are not coming in as well as is usual at this time. Householders are putting off as long as possible the laying in of the winter's fuel. It is expected that this will cause a congestion of orders and an advance in prices about Sept. 1.

The quotations on the first of the month were:

	Wilm. & Frnk. Co.	Sparta	Mt. Olive	Standard
6-in. lump	$1.35@1.50	$1.25	$1.35	$1.05
2-in. lump	....	1.00	1.25	.95
3-in. lump	....	....	1.25	....
3x6 egg	1.35@1.50	....	....	.90
No. 1 nut	1.35@1.60	....	....	....
No. 2 nut	1.40	....	....	....
No. 1 washed	1.50	....	1.50	....
No. 2 washed	1.25	....	....	....
No. 3 washed	1.35	....	....	....
No. 4 washed	1.35	....	....	....
No. 5 washed	.80	....	....	....
Screenings	.60@ .65	.65	....	.60

INDIANAPOLIS

The fall demand on the Indiana block fields has begun and mines are going on full time one after another. Situation and prices unchanged in the main fields. Retail movement good for the season.

The chief change in the local market has been the picking up of business in the Brazil block fields. Unlike other Indiana coal this may be stored and the movement to the Northwestern states has begun. The mines in this district will all soon be working good.

In the other districts, conditions are little changed though an improvement seems imminent. Railroads are busy getting their equipment ready for the crop movement, which is late on account of unfavorable weather. These preparations seem to be on a large scale, for crops are large though the quality is not the highest. The demand at Chicago has not improved. Indianapolis retail yards are moving considerable quantities of Eastern coals into consumers' bins. Prices generally are unchanged. Screenings, which turned easier the latter part of July, hold firm against any further softening.

KANSAS CITY

Wholesale market shows a slight activity but retail continues heavy.

There has been no change in the retail market during the past week. Prices are the same and if anything the demand has decreased. The wholesale market has shown a little more activity and the number of contracts being let has caused not a little excitement in the coal circles. A great many of the operators and companies are advertising coal in the daily papers and advertising the purchasing of the year's supply now.

PRODUCTION AND TRANSPORTATION STATISTICS

NORFOLK & WESTERN

Destination of shipments over this road for June of this year, the six months of this year and last year were as follows, in short tons:

	June		Six Months	
Coal	1914	1915	1914	1915
Tidewater, foreign	160,300	529,509	922,045	1,668,275
Tidewater, coastwise	310,125	291,891	1,962,226	1,606,181
Domestic	1,845,531	1,891,877	9,632,050	9,486,697
Coke				
Tidewater, foreign	....	7,572	15	16,136
Domestic	87,921	69,956	580,653	428,158
Total	2,403,877	2,790,805	13,096,989	13,205,447

ILLINOIS AND INDIANA RAILROAD TONNAGES

Shipments of coal originating from Illinois and Indiana mines during June were as follows in net tons:

Illinois Central R.R.	480,490	B. & O. S. W. R.R.	57,191
C. & E. I. R.R.	370,284	St. L. T. & E. R.R.	35,572
C. B. & Q. R.R.	350,527	C. & N. W. Ry.	31,787
C. C. C. & St. L. Ry.	332,940	C. P. & St. L. R.R.	26,414
Vandalia R.R.	326,268	L. & N. R.R.	19,009
C. T. H. & S. E. Ry.	203,071	L. & M. Ry.	17,956
Chicago & Alton R.R.	138,619	M. & O. R.R.	15,219
St. L. I. M. & S. Ry.	115,806	S. L. & B. E. Ry.	13,047
Wabash R.R.	100,412	T. St. L. & W. R.R.	11,651
C. I. & L. Ry.	61,332		

FOREIGN MARKETS

GREAT BRITAIN

July 23—The strike having been settled, work has been generally resumed at all the pits. Business is on very quiet lines at present. The market is unsettled and there are prospects that it will remain so until about the early part of August. The following are the nominal quotations:

Best Welsh steam	Nominal	Best Monmouthshires	$6.00@6.24
Best seconds	Nominal	Seconds	5.76@6.00
Seconds	$6.24@6.48	Best Cardiff smalls	5.16@5.40
Best dry coals	6.00@6.48	Cargo smalls	4.08@4.32

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—Chartering, while a little more active, continues on limited lines because of the difficulties following the miners' strike. Tonnage for prompt positions is offering abundantly. Rates are nominally as follows:

Gibraltar	$3.84	Naples	$4.80	St. Vincent	$4.32
Marseilles	3.81	Alexandria	5.52	Rio de Janeiro	6.24
Algiers	3.48	Port Said	5.28	Monte Video	5.76
Genoa	4.80	Las Palmas	4.08	River Plate	6.00

Later—Cable reports under date of Aug. 3 state that Great Britain will place a rigid embargo against coal exports of any kind to other than British possessions and protectorates. The embargo will become effective Aug. 30. Several months ago an embargo was declared against foreign shipments to other than British possessions, protectorates, and her allies in the war, but apparently even these latter are now to be excluded from obtaining the British product.

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

✚Indicates contracts regarding which official information has been received.

Recast

In the following table we give a list of all old contracts coming up for consideration during the ensuing week The table gives our contract number, the name of the purchaser, city, tonnage and page on which the detail notice appeared.

No.	Purchaser	City	State	Tonnage	Page
1010	Kansas City Soap Co.	Kansas City	Mo.		198
1054	Board of Education	Ottumwa	Iowa	1600b	157
1059	Bd. of County Comrs.	Toledo	Ohio		116
1149	Custer County	Broken Bow	Neb.		199
1152	Sch. Bd. Harmony Dist.	Minot	N. D.		199
1158	Belmont Count	St. Clairsville	Ohio		199
1159	Board of Education	Plains	Penn.		199

a Indicates anthracite coal. b Indicates bituminous.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

✚No. 821—Cranston, R. I.—This contract (Vol. 7, p. 1049), which provides for furnishing this city with approximately 1000 tons of egg coal, was bid on by both the Eastern Coal Co. and the R. E. Smith Co. at $6.36 per ton. No announcement of the award has yet been received. Address Deputy City Clk. L. A. Smith, Jr., City Hall, Cranston, R. I.

1007—New Castle, Penn.—Bids on this contract (p. 77), were received until 8 p.m., Aug. 6. Address Secy. H. M. Marquis, North & East St., New Castle, Penn.

1012—Pleasant Hill, Mo.—This contract (p. 77), which provides for furnishing the George M. Kellogg Co. with about 20 cars of slack coal per month, will probably be let about Aug. 15. Address Pur. Agt. N. F. Parker, George M. Kellogg Co., Pleasant Hill, Mo.

1022—Chicago, Ill.—It is understood that the question of awarding this contract (p. 77), which provides for furnishing the Municipal Tuberculosis Sanitarium with coal will be taken up at the next meeting of the Board which is scheduled to be held about Aug. 10. Address Board of Directors, Municipal Tuberculosis Sanitarium, North Crawford and Peterson Ave., Chicago, Ill.

1034—Youngstown, Ohio—Bids on this contract (p. 115), which provides for furnishing the Board of Education with approximately 5000 tons of coal will be received until noon, Aug. 15. Deliveries are to be made as required and each bid must be accompanied by a certified check for $500. Address Dir. W. N. Ashbaugh, Bd. of Edu., School Dist., 20 W. Wood St., Youngstown, Ohio.

1068—New York, N. Y.—This contract (p. 117), which provides for furnishing the Dept. of Docks and Ferries with 3000 tons of egg coal was bid on as follows: Streat Coal Co., $5.94; Pattison & Bowns, $5.37; Gavin Rowe, $5.46; W. P. W. Haff, $5.57. Address Dock Comr. R. A. C. Smith, Pier A, North River, New York.

1151—New York, N. Y.—Bids on this contract (p. 199) calling for furnishing and delivering 17,775 tons of buckwheat No. 3 and 5925 tons of mine-run for use in certain school buildings were as follows:

	Manhattan		Bronx	
	Buck. No. 3	Mine-Run	Buck. No. 3	Mine-Run
Tons	8250	2750	3600	1200
Burns Bros	$3.04	$2.93	$3.14	$4.03
Wm. Farrell & Son	3.39	4.23	....	.....
C. D. Norton & Co	2.98	3.73	3.23	4.03

Norton & Co. offered a rebate of one cent per ton if the city furnished dock facilities free of charge.

	Brooklyn		Queens	
	Buck. No. 3	Mine-Run	Buck. No. 3	Mine-Run
Tons	4950	1650	975	325
Gavin Rowe	$3.37	$4.12	$3.47	$4.22
C. H. Reynolds & Son	2.60	3.58	2.70	3.68
S. Tuttle's Sons & Co	2.94	4.04	3.23	4.18
Bacon Coal Co	2.76	3.81	3.11	4.16
A. J. & J. J. McCollum	2.90	3.73	3.20	4.05
W. P. W. Haff	3.11	3.71	....	.....

Rowe offered a rebate of one cent per ton if dock facilities were furnished by the city free of charge. The period of delivery will be from August 16, 1915 to March 31, 1916. Address Supt. of Supplies, Patrick Jones, Board of Education, 59th St. and Park Ave., New York City

New Business

1168—Kansas City, Mo.—The Kansas City Veterinary College will contract for approximately 100 tons of mill-run and nut coal on Sept. 1. Address Business Mgr. Dr. T. J. Stewart, 15th St. and Lydia Ave., Kansas City, Mo.

1169—Kansas City, Kan.—Frank G. Kinney & Co. will contract about Sept. 1 for 500 tons of bituminous coal, deliveries to be made during the ensuing year. Address Frank G. Kinney, 17th St. and Osage Ave., Kansas City, Kan.

1170—Louisville, Ky.—The Starks Realty Co. at this place will contract about Sept. 1 for approximately 1100 tons of nut and slack coal. Deliveries are to be made by wagon and as required during the ensuing year. Address Purchasing Agent, Starks Realty Co., Starks Bldg., Louisville, Ky.

1171—Independence, Mo.—The Municipal Light Department at this place will be in the market about Sept. 1 for its annual requirements of coal, involving approximately two cars per month. Slack coal is used chiefly, though some lump is required. Address City Clerk, Independence, Mo.

1172—Chicago, Ill.—The Audebert Wall Paper Mills will be in the market about Sept. 1 for its annual requirements of coal. Approximately one car per week of Illinois or Indiana No. 2 nut and one car of Illinois screenings are required. Address Purchasing Agent, Audebert Wall Paper Mills, Chicago, Ill.

1173—Kansas City, Kan.—Peet Bros. Soap Co. will contract about Sept. 1 for its annual requirements of coal. It consumes approximately one car per day of slack. Address N. N. Dalton, Peet Bros. Soap Co., 15th St. and Kansas Ave., Kansas City, Kan.

✚1174—Canton, Ohio—The Board of Education at this place contracts about Sept. 1 of each year for its annual requirements of coal, involving approximately 2800 tons of Pittsburgh No. 8. The current contract is being filled at $2.42 per ton. The business is let on a competitive basis. Address Board of Education, Canton, Ohio.

1175—Kansas City, Mo.—The American Radiator Co. at this place will let its annual requirement for coal, involving approximately 12 cars of slack or mill-run, about Sept. 1. Address Purchasing Agent, American Radiator Co., Kansas City, Mo.

✚1176—Topeka, Kan.—The Board of Education at this place usually contracts about Sept. for its annual requirements of coal. The present contract is being filled on the following basis: Nut, 1694 tons at $3.25; slack, 129 tons at $2.70; lump, 176 tons at $3.60. The call for bids is advertised and business is let on a competitive basis. Address Board of Education, Topeka, Kan.

1177—Kansas City, Mo.—The Keeley Institute at this place will contract about Sept. 1 for approximately 100 tons of Cherokee lump coal. Address Mgr. C. W. Wadsworth, the Keeley Institute, 31st and Euclid St., Kansas City, Mo.

✚1178—Cumberland, Md.—The Board of Education will contract some time in September for about 200 tons of big vein Cumberland coal. The current contract is being filled at about $2.25 per ton. Address Board of Trustees, Board of Education, Cumberland, Md.

1179—Kansas City, Mo.—The Kansas City Terminal Co., which operates the Union Station, passenger and freight terminals, will let its annual fuel contract for the coming year about Sept. 1. Advices will be sent out some time during August. The company requires about 100 tons of slack coal per day. Address Pur. Agt. A. J. Stewart, Kansas City Terminal Co., Union Station, Kansas City, Mo.

+1180—Columbia, Mo.—The Water and Light Department at this place will contract about Sept. 1 for its annual fuel requirements, aggregating about 8000 tons of washed slack, Nos. 3, 4 and 5 grades. The business is done on a competitive basis and the approximate cost is $2.25 per ton. Address Chf. Engr. M. E. Fawks, Water and Light Dept., Columbia, Mo.

1181—Kansas City, Mo.—The Prior Brass Manufacturing Co. will let its annual coal contract, amounting to approximately one car of bituminous a month, on Sept. 1. Address Mgr. Walter H. Prier, Prier Brass Mfg. Co., Kansas City, Mo.

1182—St. Louis, Mo.—The Cupples Station Light, Heat & Power Co. will let its annual coal contract, involving approximately 25,000 tons of screenings, about Sept. 1. About 1½-in. or 2-in. grade suitable for chain-grate stokers is required. Address Pres. H. Wurdock, Cupples Station Light, Heat & Power Co., 750 Railway Exchange Bldg., St. Louis, Mo.

1183—Middletown, Ohio—The American Rolling Mill Co. consumes about 100,000 tons of mine-run steam coal and 50,000 tons of gas per annum, and contracts when the market seems most favorable. Deliveries are made by rail, and they have practically unlimited storage capacity. Address Pur. Agt. H. O. Miller, the American Rolling Mill Co., Middletown, Ohio.

+1184—Roaring Spring, Penn.—The school board of this borough received bids until Aug. 2 for furnishing and delivering 100 tons of good steam coal. Address Secy. F. K. Lorenz, Roaring Spring School Bd., Roaring Spring, Penn.

+1185—Millersburg, Ohio—The local Board of Education received sealed bids until 2 p.m., Aug. 2, for furnishing and delivering coal as required at the local school houses in Monroe township during the ensuing year. Address Clk. J. J. Hart, Millersburg, Holmes County, Ohio.

+1186—Ponca, Neb.—The County Government will receive bids until Aug. 10 for furnishing one carload of anthracite egg coal. Address County Clk. A. N. Porter, Ponca, Dixon County, Neb.

+1187—Scottdale, Penn.—The school board of Upper Tyrone township received sealed bids until Aug. 2 for furnishing mine-run coal as required at the school buildings during the ensuing year. Address Secy. Jos. Weaver, Upper Tyrone School Board, Scottdale, Penn.

+1188—Agosta, Ohio—The Board of Education of the New Bloomington School district will receive bids for furnishing the coming year's supply of coal. White ash coal is preferred, and quotations may be either on track at Agosta, or in bin. Address Clk. J. W. Haruff, Bd. of New Bloomington Village School District, Agosta, Ohio.

+1189—McKeesport, Penn.—The Versailles township school board received sealed bids until Aug. 5 for furnishing their coal requirements during the ensuing year. Address Ben Dulany, 2514 Fifth Ave., McKeesport, Penn.

+1190—Forest, Ohio—The Jackson township board of education received sealed bids until Aug. 2 for furnishing the coal requirements of the different schools. Address, Clk. E. C. Condon, Forest, R. F. D. 4, Wyandot Co., Ohio.

+1191—Sharpsburg, Penn.—The Board of Education will receive sealed bids until 5 p.m., Aug. 7, for furnishing and delivering to the various school buildings coal as may be required during the ensuing year. Bids are requested on Cornell and Mansfield, forked coal and slack. Address Chn. of Supply Com. P. H. Young, Bd. of Edu., Sharpsburg, Penn.

+1192—New Brunswick, N. J.—The City Commissioners will receive sealed bids until 10 a.m., Aug. 13, for furnishing approximately 900 tons of No. 1 Logan bituminous coal. The coal is to be delivered at the pumping station at Weston's Mills, at the rate of about 100 tons a month, beginning August, deliveries to be completed the following April. A certified check for 5% of the total amount of the proposal is to accompany all bids. Address: Dir. Edw. F. Farrington, Dept. of Pub. Affairs, New Brunswick, N. J.

+1193—Turtle Creek, Penn.—The township school board will receive bids until 2:30 p.m., Aug. 7, for furnishing No. 1 lump and slack coal as may be required during the ensuing year. Address Secy. Wm. E. Taylor, Turtle Creek, Penn.

+1194—McConnellsville, Ohio—The Board of Education of Bloom township will receive bids until 1 p.m., Aug. 14, for furnishing coal to the schools throughout the district. Address Clk. Chas. R. Henderson, Bd. of Edu., McConnellsville, Ohio.

+1195—Green Bay, Wis.—Sealed proposals were received until 11 a.m., July 30, for furnishing the Brown County Asylum with 600 tons of pile-run, bituminous coal, quotations to be f.o.b. Smith's Spur. Deliveries are to be made during the ensuing year. Address Jos. H. Servotte, Board of Trustees, Brown County Asylum, Green Bay, Wis.

+1196—Connellsville, Penn.—The Dunbar township school board will receive bids until noon, Aug. 14, for furnishing and delivering coal as may be required at the different buildings during the ensuing year. Address, Secy. F. C. Smith, Bd. of Edu., Dunbar Township School Bd., Dunbar, Penn.

1197—Louisville, Ky.—The Dow Wire & Iron Works at this place usually contracts for their fuel requirements some time during the current month. They use about 1500 tons of West Kentucky 1¼-in. pea and slack coal a year. Deliveries are made at the rate of three cars per month by the Louisville & Nashville R.R. and their storage capacity is 40 tons. Address Pur. Agt. R. S. Carson, Dow Wire & Iron Works, Louisville, Ky.

+1198—Columbus, Ohio—The Ohio Board of Administration will contract about Aug. 20 for the coal required at 18 different charitable institutions, involving approximately 20,000 tons of coal. It will be a condition of the contract that the coal must be produced in Ohio. Address T. E. Davey, Ohio Bd. of Administration, Columbus, Ohio.

+1199—Chattanooga, Tenn.—The city government will receive sealed bids until noon, Aug. 10, for furnishing and delivering approximately 1800 tons of coal to the different fire halls, school buildings and other buildings of the city government. All bidders must submit an analysis of the coal they propose furnishing. Blank forms and other information can be obtained on application. Address Com. E. D. Herron, Dept. of Pub. Utilities, Grounds and Buildings, Chattanooga, Tenn.

+1200—Cincinnati, Ohio—The Public Service Department will receive bids until noon, Aug. 12, for furnishing and delivering coal to the Main Pumping Station, Western Hills Pumping Station and Filtration Plant of the Cincinnati Water Works Department. All bids must be accompanied by bond or certified check for $500, and must be submitted on blank forms which may be obtained on application. Address Secy. Parke S. Johnson, Pub. Service, City Hall, Cincinnati, Ohio.

+1201—Bay City, Mich.—The City Government received sealed bids until 3 p.m., Aug. 5, for furnishing and delivering coal as follows: City Hall, 450 tons of steam lump; City Detention Hospital, 60 tons same; Fire Department, 30 tons of various grades of anthracite coal and 30 tons of bituminous. Address City Compt. E. E. Prohazke, City Hall, Bay City, Mich.

+1202—Circleville, Ohio—The Board of Education of Jackson Township will receive separate bids until 1 p.m., Aug. 13, for furnishing and delivering approximately 1800 bu. of coal required at the school building during the ensuing year. Bids for delivering the coal should be made on the basis of 100 bu. Address Clk. Charles M. Niles, R. F. D. No. 5, Circleville, Ohio.

+1203—Washington, D. C.—The Commissioner of Fisheries will receive sealed bids until Sept. 1 for furnishing 825 tons of anthracite coal for delivery as follows: Woods Hole, Mass., 500 tons; Gloucester, Mass., 150 tons; Boothbay Harbor, Me., 175 tons. Blank proposal forms and further particulars may be had on application. Address Commissioner of Fisheries, Washington, D. C.

+1204—Ritzville, Wash.—The Commissioners of Adams County will receive sealed bids until 1 p.m., Sept. 2 for furnishing and delivering coal to the Court House as required in carload lots. Certified check for 5% of the cost of one car of coal must be submitted with each bid. Address Clk. J. L. Cross, Bd. of County Comrs., Ritzville, Wash.

+1205—Uhrichsville, Ohio—The Board of Education will receive sealed bids until Sept. 1 for furnishing screened coal required at the school during the ensuing year. Address D. E. Roch, Bd. of Edu., Uhrichsville, Ohio.

+1206—Sawyer, N. D.—Sealed bids will be received until 2 p.m., Aug. 16, for furnishing and delivering 100 tons of coal to the local district. Deliveries are to begin Sept. 1 and be completed by Jan. 1. Address Dist. Clk. E. D. Skinner, Sawyer, N. D.

+1207—Cloquet, Minn.—The Board of Education will receive sealed bids until 4 p.m., Aug. 7, for furnishing and delivering 500 tons of Pocahontas screened lump coal to the various school buildings as required during the ensuing year. Address Dist. Clk. L. F. Leach, Bd. of Edu., Cloquet, Minn.

1208—Kansas City, Mo.—The Evans-Smith Drug Co. at this place will contract some time during the current month for approximately 100 tons of bituminous coal. Cherokee nut coal is preferred. Address Purchasing Agent, Evans-Smith Drug Co., Kansas City, Mo.

+1209—Wahpeton, N. D.—The Richland County Commissioners will receive sealed bids until 2 p.m., Sept. 1, fo furnishing approximately 300 tons of Pocahontas mine-run coal. Bids are to include cost of delivery to the Court House. Address County Audr. F. A. Burton, Wahpeton, N. D.

+1210—Buffalo, Minn.—The County Government will receive bids until 2 p.m., Aug. 17, for furnishing 100 tons of Youghiogheny screened lump coal, 60 tons of which are to be delivered at the Court House, and the balance to be f.o.b. side track at this place. Address County Aud. John A. Berg, Buffalo, Minn.

+1211—Cando, N. D.—The Badger School Dist. No. 2 will receive sealed bids until Aug. 10, for furnishing and delivering approximately 200 tons of screened Pocahontas egg coal as required. Address Clk. H. D. Skinner, Badger School Dist. No. 2, Cando, N. D.

1212—Kansas City, Mo.—The Nafziger Baking Co. will contract for their coal supply involving about 40 tons of semi-anthracite per month some time during the current month. Address Purchasing Agent, Nafziger Baking Co., 711 Virginia Ave., Kansas City, Mo.

1213—Ft. Wayne, Ind.—Sealed bids will be received at the Indiana School for Feeble Minded Youth until 9 a.m. Aug. 10, for furnishing coal and coke during the ensuing year as follows: 150 tons of egg-sized coke, to be delivered in the bins as required; 500 tons semismokeless washed egg coal and 500 tons mine-run Pocahontas, all to be delivered during the current month; 800 tons of bituminous three-quarter lump, mine-run, nut, pea and slack or coarse slack. Bidders must give prices on each grade, together with the location of the mine and the B.t.u. value of the coal which they are willing to guarantee. Analysis must also be submitted. Prices are to be f.o.b. Ft. Wayne, Ind., L. S. & M. S. delivery. Coal is to be shipped as required. Address Supt. Dr. Geo. S. Bliss, Indiana School for Feeble Minded Youth, Ft. Wayne, Ind.

+1214—Dayton, Iowa—The Independent School District of Dayton will receive bids until 8 p.m. Aug. 11 for furnishing coal required during the ensuing year. Specifications and particulars may be had on application. Address Secy. O. S. Larson, Independent District of Dayton, Dayton, Iowa.

+1215—Springfield, Ohio—The City Government will receive bids until Aug. 13 for furnishing the annual coal supply for the local pumping station. Address City Mgr. Ashburner, Springfield, Ohio.

1216—Kansas City, Mo.—The Carnie-Goudie Manufacturing Co. will be in the market some time in the near future for five cars of Cherokee lump. Address Purchasing Agent, Carnie-Goudie Manufacturing Co., 1014 Wayandotte St., Kansas City, Mo.

+1217—Eau Claire, Wis.—The City Government will receive sealed bids until 9 a.m. Aug. 7, for furnishing 150 tons of screened coal to be delivered f.o.b. cars on side tracks between Sept. 1 of this year and July 1, 1916. Bids are requested on Hocking Valley, West Virginia splint, and screened Youghiogheny. Address County Clk. John H. Nygaard, Eau Claire, Wis.

+1218—Mott, N. D.—The Mott School District received bids until 6 p.m. Aug. 3, for furnishing approximately 250 tons of lignite coal for use during the ensuing year. Address Clk. R. E. Trousdale, Mott School District, Mott, N. D.

+1219—Cedar Falls, Iowa—Sealed bids will be received by the Cedar Falls Water and Light Department until 7:30 p.m. Aug. 9 for furnishing approximately 3000 tons of coal during the year beginning Sept. 1. Bids are requested on 1½- and 2-in. Franklin County, Illinois, screenings and should be made f.o.b. side track on the C. G. W. Ry., at the water-works plant. Address Mayor J. B. Newman, Cedar Falls Water & Light Plant, Cedar Falls, Iowa.

+1220—Knoxville, Tenn.—Bids were received until noon Aug. 3 for furnishing 2x4-in. round coal for the Knox County court house and jail. Deliveries are to be made in bins in carload lots as required. Address County Judge R. A. Brown, Court House, Knoxville, Tenn.

1221—Kansas City, Mo.—The Schulze Baking Co. at this place will receive bids for furnishing 12 to 15 tons of semi-anthracite per month. Address Purchasing Agent, The Schulze Baking Co., 2130 Campbell St., Kansas City, Mo.

+1222—Regent, N. D.—The Regent School District will receive bids until noon Aug. 10 for furnishing a good grade of lignite coal to be delivered in the bins of the local school building during the ensuing year. Address Clk. F. L. Schnebly, Regent School District No. 14, Regent, N. D.

+1223—Missoula, Mont.—The Board of School Trustees for District No. 1 will receive bids until 8 p.m. Aug. 24, for furnishing approximately 500 tons of coal to be delivered at the local school buildings as required. Address Clk. M. R. Hardenburgh, School District No. 1, Missoula, Mont.

+1224—Boston, Mass.—The Massachusetts Training Schools will receive bids until 2 p.m. Aug. 11, for furnishing semi-bituminous steaming coal to the state institutions as follows: Lyman School for Boys, 1200 to 1500 tons; Industrial School for Boys, 300 tons; Industrial School for Girls, 300 to 400 tons. Bids must be submitted on blank forms which may be obtained on application, and a certified check for 4% of the estimated amount of the contract must accompany each bid. Address Executive Secy. F. Leslie Hayford, Massachusetts Training Schools, 274 Boylston St., Boston, Mass.

+1225—Easton, Penn.—W. S. Barstow & Co., controlling the General Gas & Electric Co., announce that they are in the market for 250,000 tons of slack coal for delivery at Easton, Penn., and neighboring properties; also 15,000 tons for delivery at Binghamton, New York. Address General Pur. Agt. F. C. Rose, 50 Pine St., New York, N. Y.

+1226—Martinsburg, Penn.—The Huston Township Board of Education will receive bids until 2 p.m., Aug. 7, for furnishing the coal required at the school buildings during the ensuing year. Sonman screened coal is required. Address, Secy. E. W. Smith, Bd. of Edu., Houston Township, Martinsburg, Penn.

+1227—Coalport, Penn.—The school board at this place will receive bids until noon Aug. 9 for furnishhing coal required at the local buildings during the ensuing year. Address, Secy. P. C. Gates, Bd. of Edu., Coalport, Penn.

+1228—Johnstown, Penn.—The Board of Education at this place will receive bids until noon Aug. 14, for furnishing its coal requirements during the ensuing year. Mine-run coal is required. Address, Secy. Charles H. Meyer, Bd. of Edu., 601 Swank Bldg., Johnstown, Penn.

+1229—Clearfield, Penn.—The Lawrence Township School Board will receive bids for furnishing the coal required at the different school buildings during the ensuing year, until noon Aug. 14. Address, Secy. Amos Owens, R. F. D. No. 2, Clearfield, Penn.

+1230—Sharpsburg, Penn.—The Board of Education will receive sealed bids until 5 p.m., Aug. 7, for furnishing the coal required at the various school buildings during the ensuing year. Bids are requested on Cornell and Mansfield coal, forked and slack. Address, Chn. P. H. Young, Supply Com., Bd. of Edu., Sharpsburg, Penn.

+1231—Wilkes-Barre, Penn.—The Board of Education at this place will receive sealed bids until 6 p.m., Aug. 12, for furnishing its coal requirements during the ensuing year. Bids for the coal and for delivery should be made separate. Address Secy. W. H. Morris, 58 Lee Park Ave., Hanover Township, Penn.

1232 — Martinsburg, Penn. — The school board of North Woodbury township will receive bids until 1 p.m., Aug. 14 for furnishing its coal requirements during the ensuing year. Bids may either be by the ton or for furnishing the entire requirement. Sonman or Latrobe screened coal is required. Address Secy. W. H. Brumbaugh, North Woodbury township School Bd., South Martinsburg school house, South Martinsburg, Penn.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

No. 363—Toledo, Ohio—This contract (Vol. 7, pp. 566, 955, Vol. 8, p. 200), which provides for furnishing 6000 tons of coal for use at the Broadway pumping station, was awarded to the **M. A. Hanna Co.**, as previously announced, and we are now informed that the consideration was $1.90 per ton for "Boomer" slack of West Virginia. The contract only runs to Jan. 1. Address Supt. P. R. Cook, Water Works Dept., Toledo, Ohio.

No. 702—Peru, Ind.—This contract (Vol. 7, p. 877), which provides for furnishing the city power plant at this place with approximately 6000 tons of coal, has been awarded to the **Wyatt Coal Co.**, of Charleston, W. Va., at 87c. per ton, which is 10c. under the figure of last year. Address Mgr. Arthur Herren, Electric Light & Water Co., Peru, Ind.

No. 837—Fulton, Mo.—This contract (Vol. 7 p. 1049), which provides for furnishing the local Water, Light & Power Plant at this place with approximately 4000 tons of bituminous coal, has been awarded to the **Harris Trigg Coal Co.**, at $2.24 for mine-run and $2.37 for screen coal. Address Supt. W. J. McCarroll, Municipal Water, Light and Power Plant, Fulton, Mo.

No. 853—Boise, Idaho—This contract (Vol. 7, p. 1085), which provides for furnishing the Idaho State Board of Education with approximately 4500 tons of coal during the ensuing school year, has been awarded as follows: Industrial Training School, **Kemmerer Coal Co.**, mine-run, $4.25; screened slack, $3.50. Deaf and Blind School, **Gooding Milling & Elevator Co.**, Hiawatha lump, $6.75; mine-run, $6.05. Academy of Idaho, **Finn H. Berg**, Royal lump, $5.30 for delivery prior to Aug. 1 and $5.75 thereafter; Kemmerer No. 5, mine-run, $4.50. University of Idaho, **Madison Lumber & Mill Co.**, Roslyn-Cascade lump, $6.25 and mine-run, $6; special mine-run, $5.70 and special steam, $5.25; Kemmerer No. 5, mine-run, $6.75 and screened slack, $6. Albion Normal School, **Nibley-Channel Lumber Co.**, lump, $9.50 for delivery prior to Aug. 1, $9.75 for delivery prior to Nov. 1, and $10 thereafter; mine-run, $8. Address Aud. and Business Agt. Ralph T. Bickell, State Bd. of Edu., Boise, Idaho.

No. 870—Peoria, Ill.—This contract (Vol. 7, p. 1086, Vol. 8, p. 76), which provides for furnishing the Board of Education with approximately 5000 tons of bituminous coal, has been awarded to **Dooley Bros.**, at $2 per ton, delivered. The contract for the past year was concluded on the basis of $2.50 per ton. Address Secy. Anna Rynearson, Bd. of School Inspectors, Room 203, City Hall, Peoria, Ill.

No. 893—Milwaukee, Wis.—This contract (Vol. 7, p. 1086, Vol. 8, p. 76), has been awarded to all the recommended bidders noted in the previous issue with the following exceptions: Callaway Fuel Co., for delivery of anthracite at Milwaukee, $815; Perry Coal Co., for bituminous deliveries to Sault Ste. Marie, $567; Marinette Fuel & Dock Co., for delivery at Marinette, $1214.25. Address Lighthouse Inspector, Milwaukee, Wis.

No. 922—New Orleans, La.—This contract (Vol. 7, p. 1127, Vol. 8, p. 157), which provides for furnishing the Board of Education with approximately 2000 tons of anthracite and bituminous coal, has been let to **W. G. Coyle & Co.**, on the following basis: Anthracite egg, $8.35; nut and stove, $8.45; bituminous "Sipsey," $3.85. Address Secy. E. A. Williams, Bd. of Edu., 4th floor, Municipal Bldg., New Orleans, La.

+No. 924—Indianapolis, Ind.—This contract (Vol. 7, p. 1127), which provides for furnishing the fuel requirements of the local Board of Education and for the county poor, has been awarded to the **Commercial Fuel Co.** The bids received including that of the Commercial Co. were as follows:

	No. 4 Linton	No. 6 Buller	Pocahontas
Indianapolis Coal Co.	$2.60	$2.50	$3.60
A. B. Meyer & Co.......	2.75	2.75	3.75
Mortar & Fuel Co........	2.69	2.69	3.79
Commercial Fuel Co......	2.58	2.50	3.55

Address Trustee John W. Castor, 317 Saks Bldg., Indianapolis, Ind.

+No. 927—Shelbyville, Ind.—This contract (Vol. 7, p. 1127), which provides for furnishing the County Court House, Jail, Orphans Home and County Farm with coal during the ensuing year has been awarded to **J. O. Parrish Co.**, at the following prices: Orphans Home, $3.45; County Farm, $2.80; County Jail, $3.55. Address Aud. Frank W. Fagel, County Comr., Shelbyville, Ind.

No. 934—Worcester, Mass.—This contract (Vol. 7, p. 1127, Vol. 8, p. 40), which provides for furnishing the various public buildings with coal during the ensuing year, has been awarded to the **Peoples Coal Co.**, which was the lowest bidder at $4.57 per ton or more. Complete list of bids was given in previous issues. Address Supt. of Pub. Bldgs. George C. Halcott, Room 35, City Hall, Worcester, Mass.

+No. 935—New York, N. Y.—This contract (Vol. 7, p. 1127, Vol. 8, p. 115), which provides for furnishing the Department of Docks and Ferries with coal, has been awarded to the **Clarksburg Coal Mining Co., Inc.**, at $1.94 per ton. Address Com. of Docks R. A. C. Smith, Pier A, foot of Battery Pl., N. R., New York.

No. 937—Amsterdam, N. Y.—This contract (Vol. 7, p. 1127, Vol. 8, p. 76), which provides for furnishing the local Public Schools with approximately 900 tons of various grades of coal, was bid on by 11 different bidders, and each one was awarded the contract for supplying the coal at one school. Address Clk. Leslie L. Bedd, Bd. of Edu., High School Bldg., Amsterdam, N. Y.

+No. 947—Towson, Md.—This contract (p. 40), which provides for furnishing the Maryland State Normal School with approximately 800 gross tons of Georges Creek Big Vein coal has been awarded to the **Enterprise Fuel Co.** at $3.29 per gross ton. Address Secy. M. Bates Stephens, State Bd. of Edu., Annapolis, Md.

No. 961—New York, N. Y.—This contract (Vol. 8, p. 41), which provides for furnishing the City College with 4800 tons of No. 3 buckwheat and 1600 tons of semibituminous mine-run, has been awarded to **Charles D. Norton Co.** at $2.33 per ton for the buckwheat and $3.31 for the mine-run. Pattison & Bowns bid $2.49 for buckwheat and $3.41 for the mine-run. Address Curator of the College, Room 114, Main Bldg., 139th St. and Convent Ave., New York City.

Contract Notes

Buffalo, N. Y.—Col. F. G. Ward, Commissioner of Public Works, buys all the coal for the public buildings at this place.

Shelbyville, Ind.—The contract for furnishing the county schools with coal during the ensuing year, has been awarded to the **J. O. Parrish Lumber Co.**

Bismarck, N. D.—The State Board of Control of Penal and Charitable Institutions let the contracts for furnishing coal to the various institutions under its charge.

New Orleans, La.—The Sheffield Steel & Iron Co. has renewed their contract with the **New Orleans Street Ry. Co.** for 200,000 tons of coal for 1916 at an advanced price.

Tipton, Ind.—The County Commissioners awarded their contract for coal for the Court House, Jail and Infirmary to **Joyce & Jarvis**, of Elkin, Ind., at $2.75 a ton for West Virginia nut, f.o.b. Tipton.

Hillsboro, N. D.—The contract for furnishing the local power house with coal during the ensuing year has been awarded to the **Hillsboro Lumber Co.** Address City Audr. N. G. Nyhus, Hillsboro, N. D.

Norfolk, Va.—Seven bids were submitted for furnishing the local Water Department with coal during the ensuing year, the quotations ranging from $3 to $4 per ton for lump, $2.88 to $3 for mine-run and $2.60 to $2.75 for slack.

Port Huron, Mich.—The West Virginia Pocahontas Coal Sales Corporation has the contract for furnishing the local water works department with their fuel requirements. The contract is being filled with Panther 1¾-in. lump coal.

+Indianapolis, Ind.—Contract of the Artificial Ice & Cold Storage Co. for yard requirements of lump, egg and nut coal, has been placed with the **Consolidated Indiana Coal Co.**, to be shipped in monthly installments. The contract expires Mar. 31, 1916.

New Orleans, La.—The contract for supplying 1200 tons of bituminous coal to the New Orleans Custom House for the fiscal year ending June 30, 1916, was awarded to the **H. P. Hyams Coal Co.**, of this city. The coal was purchased under a B.t.u. guarantee.

The Car Supply—A number of railroads are giving warnings as to car shortages to be expected this fall and winter. Several carriers are taking measures to forestall trouble by increasing their repair forces and placing restrictions in the way of supplying cars, even at this early date.

The Fall Outlook—Talk of slow car movement in the late fall and winter is again heard and the fact that some operators are proceeding cautiously on new business is causing some of the prudent buyers to give it consideration. There is more than a possibility it will be an interesting fall.

New Orleans, La.—The two low bidders on the United States plant coal contract, noted in a previous issue (Vol. 7, p. 1050), the **Tennessee Coal & Iron Co.** and the **R. B. Hyams Coal Co.**, have been awarded the contract. Address United States Engineers Office, Room 325, Custom House, New Orleans, La.

Middle West—The continued encroachment of foreign coals into home territory is causing the Indiana operators much concern, and they are about to inaugurate a campaign of publicity to increase the consumtpion of Indiana coals at home, especially among state and county institutions, the majority of which are now using Eastern coals.

Pawtucket, R. I.—The Lossaine Mfg. Co. at this place consumes about 12,000 tons of New River and buckwheat coal, deliveries being made at the rate of about 100 tons per month by water to Providence, and from there to Pawtucket by rail. The company has a storage capacity of 3000 tons. Address W. W. Jollie, Lossaine Mfg. Co., Pawtucket, R. I.

Knoxville, Tenn.—Press reports are to the effect that the **Southern Coal & Coke Co.** have secured orders aggregating 220,000 tons of coal to be shipped into the Ohio territory. About 40,000 tons of this are said to have been placed with a western railroad, this representing their first purchase of this grade of coal. All of this business was obtained in close competition with Pennsylvania and West Virginia mines. The coal will be distributed from Cincinnati, Dayton and other Ohio and Indiana points.

Springfield, Ill.—The City Government has made the following awards covering municipal coal contracts, and at less prices than of recent years: **Jones & Adams Coal Co.**, 1¼-in screenings for use at electric-light plant, at $1.02½ per ton; same at water-works plant, $1.03½ per ton; **Colvin Coal Co.**, lump coal for city buildings, at $2.30 per ton delivered. The city owns and operates a municipal electric-light plant and water-works, and in addition to this considerable fuel is used for heating various city buildings.

COAL AGE

Vol. 8 NEW YORK, AUGUST 14, 1915 No. 7

The Coal Miner's Creed

I BELIEVE in the future of the coal industry; my mine and my job.

BELIEVE that the time will come when the public will recognize wholly the usefulness of the coal-mining business and will give it the same liberal measure of cordial support that it gives other industries.

I BELIEVE the time will come when all operators will make a fair profit, nothing less, and when all employees will make a fair wage, nothing less.

I BELIEVE the time will come when wasteful methods will be eliminated, accidents reduced, operation steadier and more coal reclaimed.

I BELIEVE the time will come when all operators will be honest, when contracts will be filled to the letter and when substitution will be unknown.

I BELIEVE the time will come when all miners will desire to be efficient, honest and temperate workmen; when supervision will consist of directing alone.

I BELIEVE the time will come when miners will live in comfortable dwellings in clean towns.

I BELIEVE the time will come when employers and employees will live up to wage scales at all times.

I BELIEVE the time will come when miners and operators will understand that their interests are identical; when labor wars will cease.

I BELIEVE that all these conditions will come in time, and as the time seems slow in coming—

I BELIEVE I'll get behind all good movements now—and *push!*

Written by Geo. N. Lantz

Discharge Flow and Crank Effort in Various Pumps[*]

By J. E. Holveck[†]

SYNOPSIS—An analysis of the conditions existing in power-driven plunger or piston pumps. A proper arrangement of cylinders and cranks reduces the variation of torque from 318 per cent. in the single-cylinder single-acting pump to 7 per cent. in the single-acting quintuplex machine.

There seems to be some misunderstanding as to the actual fluctuation in discharge of different types of crank-driven reciprocating outside packed plunger pumps. This subject is clearly treated in a number of text-books on pumps, which show diagrams similar to those in this article, covering duplex and triplex machines. To the best of my knowledge and belief curves of the quintuplex, or five-cylinder, type have never heretofore been published; nor does the literature on the subject contain any figures showing what the variations in the different types are.

For the benefit of those interested in this subject I will endeavor briefly to outline the formula for determining and graphically representing the discharge variations in pumps most commonly used at the present time.

The action of water in a pump cylinder and discharge pipe is determined by the plunger moving in a straight line and connected to a crank pin having a constant, rotary motion. While the velocity of the crank pin is constant, that of the plunger varies throughout the stroke from zero at dead center to maximum, with the connecting-rod at right angles to the crank.

Knowing the velocity of the plunger, the displacement or discharge can be readily ascertained for every position of the crank pin, since the rate of displacement is directly proportional to the velocity of the plunger.

By using ordinates to represent rates of displacement in cubic inches and abscissa for time we may construct a true diagram graphically illustrating the discharge from a plunger. If the curves of each plunger for any multi-plunger pump are combined in proper sequence as to time, the discharge for any pump is determined.

Let

F = Area of plunger in square inches,

W = Radians per second or angular velocity of crank pin $= \frac{\pi N}{30}$

r = Crank circle radius in inches,

N = Number of revolutions of crank per minute,

u = Velocity of plunger in inches per second,

a = Crank angle,

L = Length of connecting-rod.

The equation for plunger velocity then is

$$u = Wr\,(\sin a \pm \tfrac{1}{2}\frac{r}{L}\sin 2a)$$

and

Fu = plunger displacement in cubic inches per second.

As the crank-pin velocity is constant, the time for any position of the plunger is a function of the crank angle,

$$t = \frac{a}{360}T$$

in which t represents abscissa or time elapsed until any crank angle has been attained and T represents the total time for one revolution.

Fig. 1 represents the discharge curve of a single-plunger single-acting pump. The circle at the left of the figure is laid out to any scale with a radius FWr, or the cubic inches per second of displacement, this being a function of the crank-pin velocity. The length of diagram or base line AF represents the time for one revolution, and is made equal to $FWr \times 2 \times 3.1416$.

Lay off on this base line equal divisions corresponding to those in the circle and erect ordinates equal to the several values of Fu computed by above-cited formula. These ordinates are the rates of displacement in cubic inches per second corresponding to the respective positions of the crank. This will give the curve ABC. The mean ordinate of the curve multiplied by abscissa t, the time through 180° will give the total displacement

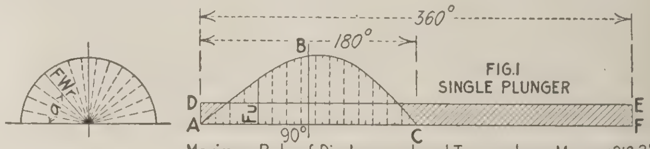
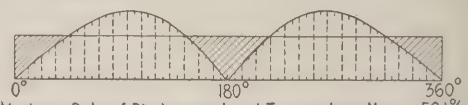


FIG.1 SINGLE PLUNGER

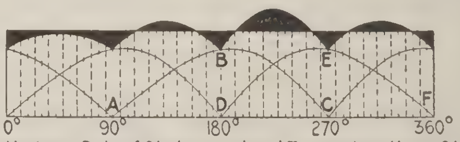
Maximum Rate of Displacement and Torque above Mean =218.2%
Minimum " " " " " below " =100.
Total Variation =318.2%

FIG.2 DOUBLE PLUNGER



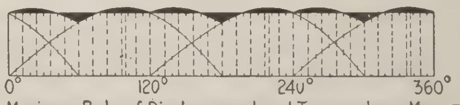
Maximum Rate of Displacement and Torque above Mean =59.1%
Minimum " " " " " below " =100.
Total Variation =159.1%

FIG.3 DUPLEX DOUBLE ACTING



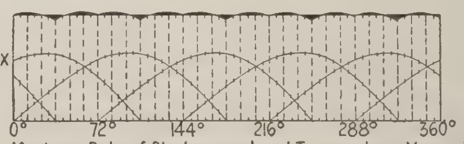
Maximum Rate of Displacement and Torque above Mean=24.1%
Minimum " " " " " below " =21.5%
Total Variation =45.6%

FIG.4 TRIPLEX SINGLE ACTING



Maximum Rate of Displacement and Torque above Mean= 6.1%
Minimum " " " " " below " =16.9%
Total Variation =23. %

FIG.5 QUINTUPLEX SINGLE ACTING



Maximum Rate of Displacement and Torque above Mean= 1.8%
Minimum " " " " " below " =5.2%
Total Variation =7. %

DIAGRAMS SHOWING CRANK EFFORT AND DISCHARGE OF VARIOUS TYPES OF POWER-DRIVEN PUMPS for the discharge stroke. *A* to *C* is the discharge stroke and *C* to *F* the suction.

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[*] Diagrams furnished through courtesy of Aldrich Pump Co., Allentown, Penn.

[†] 2218 Farmers Bank Building, Pittsburgh, Penn.

These diagrams illustrate also the tangential force or torque for every position of the crank. In this case the radius of the circle represents total load on the plunger and the ordinates the torque in pounds.

SUPERIMPOSED CURVES SHOW ACTION OF MULTI-PLUNGER PUMPS

For more than one plunger it is only a matter of locating the curves in the diagram as they occur in the crank circle. Since crank-pin velocity is constant and the plungers are equally spaced on the crank circle, the curves must be equally spaced on the diagram by

$$t = \frac{a}{360} T$$

Fig. 2 represents a single crank double plunger pump (one crank, two plungers). Fig. 3 represents a duplex double-acting pump (two cranks, four plungers).

The irregularity of pulsation in Fig. 3 is due to the fact that with the plunger on the forward stroke the displacement is greater through the last 90° than the first, since the maximum velocity occurs with the crank at 99° 29′ 43″ of the discharge stroke and area *CBD* is greater than *ABD*. When discharging on the return stroke the maximum velocity occurs when the crank pin reaches 80° 30′ 17″ of the discharge stroke and area *FEC* is less than *DEC*. Therefore the greatest areas, *CBD* and *DEC*, overlap between 180° and 270°, and the smaller areas, like *ABD* and *FEC*, overlap between 0° and 90°. The overlapping areas between 90° and 180° and between 270° and 360° are equal.

Fig. 4 represents a triplex single-acting pump (three cranks, three plungers). This figure holds true for a triplex double-acting pump, or sextuplex. The area of the diagram, however, would be twice as great. There is nothing to be gained by six cylinders as far as evenness of flow and torque on the shaft are concerned, as the cranks would be 60° apart, giving the same number of pulsations. This can readily be seen by filling in additional curves from 60 to 240, 180 to 360 and 300 to 60, noting that all the ordinates have just twice the value.

Fig. 5 represents a quintuplex single-acting pump (five cranks, five plungers).

In these diagrams the ratio of crank-circle radius to connecting-rod length is 1 to 6, and the ordinates, computed for every three degrees, give accurate values. The types of pumps for which these ratios have been determined cover only the outside packed plunger variety.

For piston types the variations are somewhat greater, due to the effective area of the piston being less on the return stroke on account of the piston rod.

Air chambers and spring alleviators are sometimes employed to reduce the fluctuations in discharge and flywheels to compensate the variations in torque. The diagram shows the results of the different types without these appurtenances, which may be considered but means for partly alleviating a condition determined by design.

Air chambers are ineffective unless they are amply large and kept charged. This is practicable in low pressures with the use of a small air compressor for charging and keeping the air vessel filled with air. Spring alleviators are used in the higher pressures, and the amount of fluctuation taken care of depends on the number of coils employed.

Flywheels are not the usual practice except in some single-crank double-acting pumps. The manufacturers seem to rely on the moving parts of the pump to overcome the variations in torque. Actually only a small part of this variation is compensated for by this means. While this unsteadiness of action is not so serious on small units, it nevertheless affects the efficiency and life of the machine. On pumps of large capacity and horsepower the excessive variation in the discharge line and torque on the shaft is of great importance and should receive first consideration. It should be apparent that the smoother the action of the pump, the more efficient it is, and less subject to excessive wear.

Of all the pumps illustrated the quintuplex and triplex single-acting machines show the best results. The quintuplex has very little variation in discharge and torque. With but one more plunger than the duplex double-acting it is more than 6½ times smoother in action. The triplex, with one less plunger than the duplex double-acting, has only half the amount of fluctuation.

The triplex and quintuplex types have quite an additional advantage in being single-acting, in which all loads are made to act in one direction. This is not the case in the duplex double-acting, nor in triplex double-acting machines. In the former, two plungers are on the discharge stroke when moving in opposite directions. The plunger loads act oppositely through a total of 180° of crank movement. The triplex double-acting pump has always two plungers moving one way and the other in an opposite direction when discharging. Those actions, which produce abnormal stresses in the shaft, bearings, frames, etc., of double-acting pumps, are not met with in triplex and quintuplex single-acting machines.

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Coal-Mining Conditions in St. Etienne

Conditions in the coal-mining industries of the St. Etienne district of France, says Consul William H. Hunt in *Commerce Reports*, during the first 7 months of 1914 were normal, the quantity and value of the production being nearly equal to that for the same period in 1913.

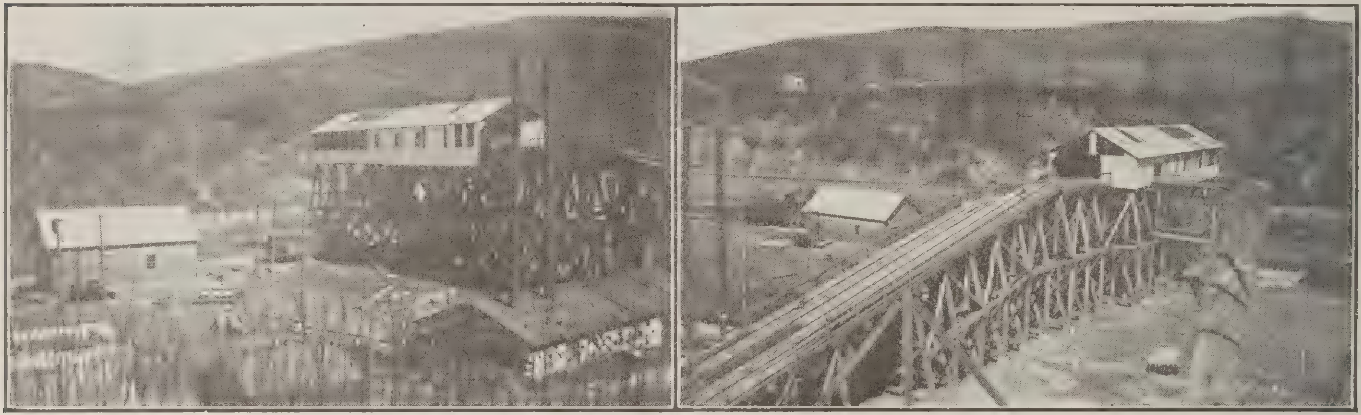
After the war began the military authorities granted all miners belonging to the territorial army a suspension from active military service, in order that the mines might not be shut down entirely by reason of the mobilization of the younger mine workers. The arrival, however, of a large number of Belgian and French miners, refugees, who formerly worked in the coal mines of Belgium and northern France, saved the situation; yet the output was far from normal. I am reliably informed that the quantity of coal produced in the Loire Basin from Aug. 1 to Dec. 31, 1914, shows a decrease of 50 per cent. in the output, compared with the statistics for the last five months of 1913.

The mining bureau of the Loire Department gives the total production of all kinds of coal in this region in 1914, in metric tons, as follows: Soft coal, 3,329,925; patent fuel (briquettes), 209,020; coke, 138,472; anthracite, 1012.

Application of Electric Power at the Soudan Mine

The Soudan mine of the Youghiogheny-Pittsburgh Coal Co., which recently began shipping coal, is one of the best-equipped mines in the country in which electrical power is employed.

The elimination of the boiler and generating plants usually found around mines generating their own power adds greatly to the appearance of the surface layout of this operation. Located in Washington County, on the Ellsworth branch of the Pennsylvania R.R., this mine will develop a large acreage of Pittsburgh coal at a proposed daily output of 2500 tons.


TWO VIEWS OF MINE TIPPLE AND POWER HOUSE AT THE SOUDAN MINE

The coal is reached by a concrete-lined double-track slope about 500 ft. long on a 20-per cent. pitch. The manway and airway are constructed in a two-compartment concrete-lined shaft, rectangular in section and with an 8-in. reinforced partition wall between the stair and airway compartments.

Ventilation is secured by means of a 9 ft. by 8 ft. 10 in. American Blower Co. Sirocco fan, set in a brick and concrete housing entirely of fireproof construction. The fan is belt-driven by a 175/50-hp. three-phase 2200-volt motor, controlled from the powerhouse.

SLOPE AND PORTAL TO MINE SHOWING SAFETY DOGS EVERY 20 FT.

The powerhouse is 45x30 ft., of fireproof construction, being built of hollow tile. It contains the motor-generator set, switchboard and haulage engine; it is also the charging station for miners' lamps. The motor-generator set furnishes 250-volt direct current for inside work. West Penn power is used exclusively at this plant, all motors being built for 2300-volt three-phase alternating current.

With this system the engineer controls all of the machinery outside of the mine from the powerhouse. As an extra precaution the motor driving the haulage is equipped with a remote-control circuit-breaker, from which wires are run and connected with small knife switches on the tipple and elsewhere along the haul. In cases of emergency the rope may be readily stopped, without resorting to the bell signal, by merely opening one of these switches.

The system of hauling coal to the surface is the one best-suited to the local conditions. The equipment embraces 2700 ft. of 1¼-in. endless plow-steel rope, to which the cars are attached by means of cast-steel grips. The rope extends back into the mine 300 ft., at which point are located the tail sheave and tension carriage. Safety dogs are placed every 20 ft. on the uphaul to hold the cars in case the grips should slip. The rope is driven by a 150-hp. 2200-volt three-phase induction motor.

A Frame Tipple Is Employed

The tipple is built of heavy frame construction from native lumber and consists of 12x12-in. white oak bents substantially braced. This building is equipped with two crossover dumps of latest design, and also the most improved screens and weigh pans. The slate is readily disposed of by means of a spur extending from the side of the tipple.

There are four loading tracks with crossovers to facilitate shifting cars. Each is of sufficient length to hold 60 cars.

Inside the mine, development work is being rapidly pushed forward, a 7½-ft. short-wall undercutter and a 7-ft. breast machine being successfully used on entry work while locomotives are employed exclusively for gathering.

In accordance with the directions of the owners to provide comfortable homes for the employees in a sanitary location, the site of the town contiguous to this mine is one of the prettiest in the state. Double frame houses of 10 rooms, with 6-ft. cellar, as well as small 3-room cottages of neat design for the use of smaller families have been built.

Each family has a large plot for gardening and vegetable raising.

A water system furnishing pure spring water for household use has been installed, while adequate fire protection is now being projected.

Synchronous Motors for Coal-Mine Operations

By C. A. Tupper*

SYNOPSIS—The practice of employing synchronous motors for driving coal-mine equipment where the load is constant, or nearly so, is growing. This is because they tend to correct the disadvantageous low power factor that usually prevails in an underloaded alternating-current distribution system.

In the electrification of coal mines and surface plants, one of the most notable of recent tendencies has been the action of some of the larger operators in adopting synchronous motor drive for compressors, pumps, fans and other machines or lines of shafting which require considerable power and are operated continuously at constant speed. The object is to take advantage of the characteristics of the synchronous motor in equalizing the power factor of an alternating-current distribution system.

To understand the significance of this, it will be well to consider what "power factor" means.

When an alternating current and its electromotive force or voltage are in the same phase, that is, rise and fall in strength exactly together, the power in the circuit is the product of the volts and the amperes. But when the current lags behind the electromotive force, as when flowing to underloaded induction motors or transformers, or when it leads the electromotive force, as in flowing to a second generator, the power in the circuit is less than the product of the amperes and the volts. Whether the current lags or leads, the actual power obtainable from the circuit will be equal to a certain definite percentage of the power that the circuit would represent were the current and electromotive force in phase. This percentage, called the "power factor" of the circuit, is thus the ratio between the true power and the normal rated power of the generators.

Output Depends on the Power Factor

To illustrate: If a generator is designed to deliver 1000 kw. of energy at unity power factor—such rating, however, being usually given in kilovolt-amperes to indicate the absence of any deduction for loss in power factor—at 85 per cent. power factor it is good for only 850 kw.; at 80 per cent., no more than 800 kw., etc.

Taken by itself, an incandescent lamp load gives a power factor of 90 to 95 per cent. Fully loaded static transformers and induction motors running near full load, either separately or in combination with a lamp circuit, give high-power factors. Arc lamps yield a power factor varying from 70 to 80 per cent. at full load. Unloaded or lightly loaded transformers and motors of the induction type show, however, a low power factor on the average, seldom better than 70 per cent.

As the load is reduced, the power factor decreases rapidly. Lightly loaded transformers have an extremely low power factor.

Synchronous motors, however, will operate at any desired power factor, as this is dependent on their field current and is, therefore, under control. Varying the strength of the direct current exciting the field magnets, which can readily be done by an attendant while a machine is running, will cause any desired variation in the power factor.

In this manner it can not only be raised to any degree, but can be made to neutralize the effect on the entire system of other apparatus having a lower power factor, thus bringing the value in the transmission and distributing lines and on the generating plant, i.e., for the complete circuit, up to approximately 100 per cent., irrespective of other apparatus.

The synchronous motor can be constructed to operate on single phase or polyphase circuits, with, of course, the proper winding in each case. When its fields are fully excited, and it has been brought up to its rated speed, which can be done by a small induction or direct-current motor mounted on the same shaft, or by a special winding on the rotor, as explained farther on, current can be thrown on from the main supply as soon as synchronism is indicated by lamps or by a suitable instrument on the starting panel. Then, provided the speed of the main generating unit or units is properly regulated, this type of motor will run at constant speed from no load up to a very heavy overload.

The installation and care of alternating-current motors require considerably more attention for the synchronous than for the induction type; and anyone contemplating the use of the former, or who is not now getting satisfactory service from such machines already installed, will do well to consider these conditions.

In the first place, a synchronous motor should be installed in a dry room or chamber, where it will not be exposed to more than atmospheric moisture; it must also be protected from flying coal or other dust, from inflammable gases or combustible material. The location ought, also, to be cool and well ventilated, as any increase in the temperature of the room is added to that of the motor.

If the coils of the motor have been exposed to a low temperature before the machine is set up, their coverings should not be removed until they have had time to attain a temperature approximating that of the room. Otherwise, when opened, they will "sweat," with consequent unfavorable effect on the insulation.

Foundations Should Be Heavy

The foundation should be heavy enough to secure freedom from vibration, and in constructing it provision must be made for foundation bolts to hold the base or adjustable slide rails of the machine. Motors of, say 100 hp. and under, can be set on heavy timber supports; but a concrete or masonry foundation is to be recommended wherever possible.

Where a large synchronous motor is direct connected on the same shaft with the machine to be driven, as in the case of compressors of considerable capacity like those illustrated herewith, procedure resembles that of the installation of engine-driven generator units. The motor yoke usually rests on sole plates secured to the foundation. These sole plates, however, are frequently made in two parts, the lower one being bolted down while the upper is adjustable with shims to facilitate centering the stator with respect to the rotor. The smaller belted motors are usually shipped completely assembled, with the stator yoke and bearings fastened to the base or fitted with slide rails.

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*Cleveland, Ohio.

The best plan for handling the parts and putting them in position will depend largely upon the size of the motor, the location and the handling facilities available. If a crane spans the room the work is comparatively easy; but in the absence of this a horse or tripod made of heavy timbers should be provided, made sufficiently strong and well secured at the base to hoist the motor parts into place by means of a chain block.

After the machine has been carefully erected and all of the connections have been made and tested by the usual methods, both sets of windings should be dried out by slow operation; then it is ready to place in regular service, provided that the machine to be driven is in running order also.

Assuming that the synchronous machine has an auxiliary motor for starting, preferably of the induction type, the procedure will be as follows:

See that the switches on the supply circuit are open; and, if the current is taken through a step-down transformer, close the oil circuit breaker on the high-tension side of the latter; also, make connection to the source of excitation with the field rheostat all in, and insert the plug for the direct-current voltmeter. Then put in the synchronizing plug. Start the synchronous motor by closing the starting motor switch. Build up exciter voltage to normal, adjusting the exciter rheostat and gradually cutting out resistance from the field until the proper amount is reached.

Meanwhile, the auxiliary motor has been bringing the synchronous motor to slightly more than synchronous speed, as compared with the generator furnishing the supply; so the synchronous motor is slowed down to that speed by the closing of the switch controlling the synchronizing resistance. If the speed becomes too low, the latter switch is opened and closed again until the speed is right.

When the synchroscope or the lamps commonly used for this purpose indicate synchronism, current from the main supply circuit is thrown in and the starting motor and synchronizing resistance cut out. The field rheostat is then adjusted, as described in the early part of this article, so as to have the most favorable effect on the power factor. The apparatus to be driven is started up under friction load only when practicable, or by means of a belt shifter, tight and loose pulleys, friction clutch or barring device, as may be required.

SELF-STARTING SYNCHRONOUS MOTORS HAVE LOW STARTING TORQUE

Self-starting synchronous motors, made in the smaller sizes, are provided with a cage winding on the rotating element similar to the rotor winding of the ordinary induction motor. This serves as an induction-motor secondary winding during starting.

A self-starting synchronous motor is usually designed to develop a maximum torque at starting equal to about 30 per cent. of that generated under normal running conditions and to pull into synchronism at approximately 15 per cent. of running torque. Consequently, this type of motor is only adaptable in cases where easy starting requirements prevail, such as driving direct-current generators, pumps that are started up with a bypass, short lines of unloaded shafting, etc.

The method of putting a self-starting synchronous motor in operation is similar to that used with a standard squirrel-cage induction motor; that is, by applying reduced alternating-current voltage directly to the armature winding. Ordinarily only one starting voltage—anywhere from one-quarter to one-half of normal—is required, and this is obtained through an auto-transformer with suitable tap. In applying the reduced voltage, an auto-starter switch serving as a combined starting and line switch is used.

Owing to the fact that during starting a dangerous voltage would be induced in the field winding if this circuit were left open, it is necessary to use a double-throw switch in order to close the field circuit through the field rheostat until operating conditions are obtained. This limits the current which would otherwise decrease the starting torque.

HOW TO START A SYNCHRONOUS MOTOR

The details of starting are as follows: After first making sure that all switches are open, with all the rheostat resistance in, close the double-throw field switch above mentioned, and make the connection to the main supply circuit; then bring the auto-starter switch up to starting position. The motor should speed up to synchronism in a minute or less. When this has been accomplished, as indicated by the synchroscope or lamps used in its place, throw the field switch over with all rheostat resistance still in; then put the auto-starter switch over to running position, applying to the motor the full line voltage, and finally adjust the field rheostat for minimum armature current and the best effect on the power factor of the system.

Regulation of the exciter voltage will be as above described for a machine started by an auxiliary motor, the connection being made through the double-throw switch in the field circuit. If, however, the exciter is mounted directly on the shaft of the synchronous motor, the field discharge switch can be single-throw and the field connected directly through the exciter armature with the rheostat in the circuit. The field is thus short-circuited at standstill and is gradually charged as speed increases.

In general it may be said that the same care should be given a synchronous motor as an alternating-current generator of the same size and characteristics. And if this is done the service which it will render and the favorable effect which it will exert on the power factor of the system will well repay the attention given.

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Explosives Should Be Handled with great care, and in this direction it may be useful to keep in mind the eight causes of accidents when shotfiring quoted by Professor Courtenay de Kalb: (1) A hole missing fire. Driving a wedge near the hole two days later has been known to explode the charge. (2) Using a short fuse to hasten explosion has exploded the charge before the workmen could retreat. (3) Smoking a pipe while charging a hole. (4) Loading a hole with the aid of an iron stemmer. (5) Firing a charge in a hole to clear it of water, and immediately reloading. (6) Ramming a charge in a hole with an iron crowbar; also tamping a charge with an iron bar. (7) Drilling out a misfire shot with a blunt drill. (8) Forcing a cartridge into too small a hole.

W. B. Owen's Reminiscences

W. B. Owen, of Dorranceton, near Scranton, Penn., who was formerly foreman of the Pettebone Colliery of the Delaware, Lackawanna & Western R.R. Co.'s coal department (now the D., L. & W. Coal Co.), recently wrote the following reminiscent letter to the Wilkes-Barre *Daily News*:

As the bell on the carpenter shop rang for work on the morning of June 1, 1859, I entered the primary department in Bellevue breaker to begin my education in the "Black Art." Sitting in my library today, in a reminiscent mood, with my diploma in my hand, my mind reverts to that momentous day when, with aching back and bleeding fingers, I arose from the stove-coal chute and with jubilant spirits betook myself home, for on that day of 10 hr. I had earned just 17c. For my first working month of 26 days I received the sum of $4.42. This rate of wages continued until Jan. 1, 1860, when for good deportment I was advanced to 28c. per day.

When 200 Tons Was a Big Day

The working day was divided into quarters. If the breaker started up and worked only 10 or 15 min. the men were paid for one quarter of a day. Full coal for the miners meant a full day for everybody. Two hundred cars of coal hoisted was considered a "big day."

Egg coal was used exclusively for generating steam. Everything under chestnut size was sent to the culm bank as refuse. It is safe to say that in those days some of the culm banks contained a greater percentage of coal than some of the veins now being worked.

The system of condemning coal for rock and slate was in an embryonic state. If a car of coal contained from 10 to 20 per cent. of rock (the quantity was always estimated) the top of the car was picked off and the consumer was allowed to clean the rest. The iniquities of the coal inspector had not yet been conceived. There were no modern "cost sheets" to give the poor bosses nights of wakefulness trying to frame explanations that do not always explain. This cost sheet of the coal-mining department is the greatest instrument ever devised by the company to keep down the cost of mining coal.

In those days lard oil, and later whale oil, was used for lighting purposes in the mines, and this was given gratis to the men and boys. There was no restriction on the use of timber and supplies, yet they were used with greater economy than today. The total production of coal from the company's mines in 1859 was 336,082 tons, which is less than one-fourth of the present annual output of the Woodward or Truesdale collieries alone.

Happy the Man Who Made a Dollar a Day

Following is the approximate rate of wages paid at that time: Hoisting engineers, $1 per day; firemen, 68c.; laborers, 50c.; slate-pickers, 17c. to 25c.; door boys, 25c.; single drivers, 48c.; team drivers, 62c.; driver bosses, $1.35. Yet the days of these low wages were days of peace, happiness and contentment.

There was only a slight increase in the wages paid until 1865, when the war closed and the demand for coal became so great that wages were increased from 50 to 100 per cent. Miners were paid $2 per car and got all the cars they could load. It was not unusual for miners to receive from $200 to $500 per month. Drivers who formerly received 65c. per day were raised to $2.20.

The news of this prosperity was carried to foreign shores and received an eager hearing from the hungering hordes of Europe, and they swarmed into the coal fields of Pennsylvania. When both the demand for coal and its price were reduced, wages were also lowered. Then the seed of discontent began to germinate; unions were formed and enmity sprang up in the hearts of the men. The days of unrest were begun, and they will never cease as long as coal is mined.

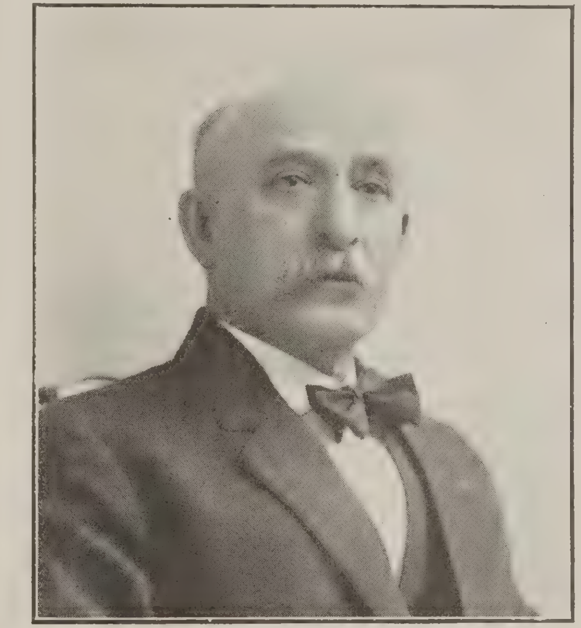
In 1872 the company was obliged to sue for relief in order to avoid failure. Employees in well-paid positions, such as engineers, conductors, officials, and in fact all the employees except miners and day laborers, were asked to submit to a reduction in wages, with the promise that when the stock again went up the wages would also be increased. The employees consented, but the agreement was never kept. If the same efforts to promote economy that are so strenuously urged today had been practiced at that time conditions would have been different.

With modern methods of mining the percentage of accidents, both fatal and nonfatal, is higher now than in those early days. Notwithstanding the laws enacted to protect men and boys and the safeguards thrown about employees and despite the keen competition among the companies to provide the greatest protection and the most efficient "first aid to the injured," the number of mine accidents is appalling.

Accidents Were Usually Charged to Carelessness

In the early days a fatal accident aroused universal sympathy; a collection was taken at the mines for the poor widow and the neighbors took care of her and the orphans. An appeal was seldom made to the company except for coal. And why? Because it was generally understood that the accident was the man's own fault. To what, then, can we attribute the enormous number of accidents of the present day?

With all the "safety first' signals and the warnings on every side, men and boys will rush headlong into danger with utter disregard for their personal safety. Liability and compensation acts are partly responsible for this condition. Men do not seem to hold their personal safety in such high regard as they did formerly.



W. B. OWEN

Fear of Heaven's displeasure kept men from danger then; now they do not even think of Heaven. In the early days men here, as in Wales, used to hold a prayer meeting at the foot of the shafts before entering their chambers. Today the prayerless man will enter his chamber disregarding all civil and moral laws, will deliberately return in mad haste to a delayed blast and will receive injuries. He will then establish a residence in an adjoining state, go before a jury that is ignorant of conditions in the mining districts, and will obtain a verdict of $50,000 or so. In the old days a gift of $50 and a scolding from his boss and the neighbors would be considered sufficient compensation.

After an unbroken service to the "D., L. and W. company" of 56 consecutive years, during which time I never received an injury or earned a cent from any other employer, and with boundless gratitude to Almighty God, I bid farewell to my "alma mater."

Seventeen Cents per Day and Upward

Mr. Owen's first day's work described in his reminiscences was performed when he was only 9 years old. He is now 65 and the company has pensioned him. He has been a slate-picker at 17c. per day, a driver boy at 28c., a driver at 42c., a team driver at 57c. He has bailed water and cleaned track for 70c. a day, run a plane for 87c., been outside barn boss at $1 per day, blacksmith at $1.35, and weighmaster at $1.64 per day. In 1875 he was made assistant foreman. As can be seen by his letter, he is remarkably well-educated for a man having such limited opportunities, his hobby being astronomy. It is not necessary to say that Mr. Owen has hosts of friends. His reminiscences are calculated to make every reader the friend of the genial Welshman.

Rebuilding an Unprofitable Mine

SYNOPSIS—A review of the conditions found in an unprofitable mine where the equipment was inefficient. The detailed steps that were employed in rebuilding the plant, and the results that were afterward obtained.

The mine here described is one owned and operated by a large company and has been in operation for about 20 years, but on account of the ambitious desire of several successive superintendents to make a record for themselves by producing coal at a low cost, the equipment not only had been neglected, but had not been increased by the management as the mine grew in size.

In the mine, the workings had become widely scattered. There were three divisions, any one of which if properly handled would have produced the required output of 1500 tons per day. The method of working was careless, and when one working place became bad, instead of timbering and making it safe, it was temporarily abandoned and another place substituted.

This in time caused the rib work to become very irregular, and as all rib work is more or less squeezed because of the weight, this lack of systematic mining caused the fracture line to be in such a condition that it was practically impossible to maintain a good system of ventilation. As there was more or less gas in the gob at times, mining work became hazardous, for it was quite impossible to remove the gas on account of the irregular fracture line.

By way of explanation, mining was on the room-and-pillar system. Rooms were 12 ft. by 300 ft., driven on the face of the coal off butt headings which were about 1200 ft. long. These rooms were driven sometimes 80 ft. centers and very frequently 40 ft. Often they were allowed to remain four or five months before the rib coal was extracted, and when this was done, instead of taking ribs out in uniform line, it often happened that four or five ribs were allowed to stand until they were as much as 150 ft. behind the fracture line. These workings were so extensive that they extended over a territory of about 4 sq.mi., so it was not unnatural that three sections out of fifteen were in a bad condition.

Economical Mining Was Impossible

The mining had been conducted in such a way that there was three times as much track as would have been required had the mine work been concentrated. The greater part of the rails in the track had been carelessly laid, there were not sufficient ties and frequently no splice bars, and nearly all the track was in a miserable condition.

The mine, on account of lack of thought on the part of the operators, had been allowed to grow in size and output without any corresponding increases in mine equipment. The chief reason for this policy was a matter of economy. The mine equipment in the way of cars and motors was little more than half what it should have been for economic operation. Thus men were not furnished as many cars as they could load. The poor condition of the cars caused the loss of coal and the sifting of dust on the track, causing much trouble.

Bad car axles and wheels as well as a bad practice of using sprags caused many wrecks, stopping empties as well as loads. There was not a sufficient number of motors to allow time for thorough and systematic repair work; consequently much time was lost in temporary emergency repairs. The grades were 4 and 5 per cent., and the use of sprags on only one side permitted the use of sand on only one rail; thus the motors were worked on one side. In keeping with the rest of the bad conditions, the drainage had been neglected and water on the haulage-roads caused the motor to slip and greatly reduced its capacity.

Surface Conditions Just as Bad

Outside of the mine, the machinery and equipment were in about the same condition. The shaft was wet, making it disagreeable for the men to travel on the cages. Also it was difficult to keep the hoisting ropes lubricated, and they had to be changed before they had been used more than one-third of the time they should serve under normal conditions.

The repair shop was divided into three sections or rooms. The windows were small and always dirty, and the electric lamps were not placed so as to give the men the necessary light.

The miners' houses were as poorly maintained as the mine. There were leaky roofs, bad floors, loose windows and many other undesirable conditions in the yards and streets. Such a state as was found everywhere caused much dissatisfaction among the employees and resulted in bringing in an inefficient, unruly class of miners. The foremen as well as the men were given to drinking.

The first important change made after the new superintendent went on the job was the gradual replacing of the foremen of the different branches of the organization with men who would think for themselves and who were total abstainers, for it was the opinion of the new superintendent that one who drinks in even a moderate degree is not a proper person to handle men in a hazardous occupation.

The next important step was to get the mine-car equipment repaired and increased to a point where it would handle the coal without delays and increase the production per man. Time was counted as money, and by eliminating the delays, the loss of coal and the wrecks, the efficiency of the men was increased about 30 per cent.

Work was begun on the haulage-roads immediately. They were relaid with heavier iron, and good ditches were made to prevent the flooding of the tracks. There was not an appropriation for a new motor, so the best had to be made of a bad job. The well-repaired cars, dry track and new rails all helped to relieve the strain and troubles of the motors. Each night the electric locomotives were taken to the shed and turned over to repairmen, who continued this work of rebuilding for six months, doing only such jobs each night as might be finished in time for the motors to be used in the morning. Thus little time was lost during the day in repairing the motors. Efficiency in two months was 25 per cent., and in six months, 50 per cent.

Mine work was concentrated, two sections being used, while the third was abandoned. The places which had been left idle on account of gas were carefully inspected and worked; the rib work was straightened, thereby simplifying the ventilation until in eight or nine months gas in any working place was an unknown thing. The cost of ventilation was reduced 50 per cent. in 10 months.

THE MINE WAS AN ISOLATED ONE

The mine was located 1½ mi. from the interurban line and 5 mi. from the nearest city. As there was no conveyance from the car line to the coal camp, the miners were not as eager to select this village as a home as some other places nearer the city. Considering the condition of the entire plant before the reorganization, one can readily see that an undesirable class of miners predominated. After the mine had been put in a better working condition, the worst men were discharged as fast as better men could be found to take their places. As the more industrious men took the places of the hard drinkers, there was less laying off after paydays, and fewer miners took advantage of the numerous holidays in their church life.

The hoisting shaft was made dry by means of a water ring excavated in the strata back of the timbers and made water-tight by concrete. An iron pipe was used to convey the water to the bottom of the shaft. Thus the life of the hoisting rope was prolonged to at least three years.

The repair shop was cleared and remodeled, making one long workroom. The windows were made twice as wide and kept clean. Electric lights were put at places where they would give the best service.

The miner's houses were carefully inspected, and all necessary repairs were made as soon as possible. Porches were placed at the front and back of the houses, and the cellars were made dry. The yards were inclosed with fences, and miners were told to grow something green, if only weeds. People were encouraged to make gardens, and the number of hydrants was increased so that water-carrying was no great task. The streets were cleaned, and concrete drains were provided to carry away the water. Garbage cans were placed in the alleys and periodically emptied.

While only a few years ago this plant was considered one of the most expensive in operation, today it numbers among the cheapest in the cost of producing coal and has a reputation of being one of the best mines in the region in which it is located. It now has a force of strong bosses, some of whom are the best-paid men in the region.

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New Zealand Government Mines

The government-operated coal mines of New Zealand, says *Commerce Reports,* produced 189,495 tons of coal during 1914 out of a total production of nearly 2,000,000 tons. This coal is placed on the market in competition with the privately mined and imported coals and is of a fair quality. The coal production of New Zealand has increased from 719,546 tons in 1894 to 1,888,005 tons for 1913.

Extracts from a Superintendent's Diary

A college mate of mine sent me a newspaper clipping today containing a poem describing the life of a miner as a poet imagined it must be. About every third line contained the word "dark," and the last line carried a desponding appeal for "light." It was more than an appeal, it was a prayer in which the miner begs that the horror of the dark may be relieved by a few stars. The heavens are so full of stars, why couldn't just a few be spared to overcome the impenetrable inky blackness of the mines? What fascinating imagination! Surely, no one but a poet could have conceived that.

And my friend wasn't joking either; he was just as much in earnest as the poet was. He sent it to me as a literary gem. The receipt of the poem started a train of recollections. Ever since I entered the mining game I have received letters from friends wanting to know how human beings can accustom themselves to "impenetrable darkness." Yes, every last one of them has put in that word "impenetrable." Undoubtedly, some poet used the word in a poem that has traveled far and wide, although it has not been my good fortune to run across it; and the phrase was used so effectively that now the adjective "impenetrable" immediately suggests mines to them whenever they see it in print.

I am wondering what will happen to my correspondence when the same city friends read this other poem with the suggestion about the stars? If the bare mention of impenetrable darkness has made such an impression, what will the combination of stars and impenetrable darkness do to their imaginations and to my mail?

Last summer while in New York I made a special point of taking several of those friends around to hotel lobbies that depended entirely upon artificial light, and in addition to artificial light required large force fans to maintain artificial ventilation. I was very particular to pick out hotels where the ventilating problem had been given careful consideration, and in consequence were the most comfortable places to be found during the hottest hours of the day.

Being a stranger in the city, I was privileged to ask questions, and I always wound up by asking for information as to the effect of artificial light and ventilation on the death rate of hotel clerks. My hosts generally took a second look at me to see whether I was in earnest, and satisfying themselves on that score, they suggested that they were not familiar with the statistics, but if their business permitted they would be willing to take chances under similar surroundings.

That gave me my opportunity, and I never failed to rub it in good and strong. I contrasted the miner working in the quiet of his room, surrounded by cool fresh air and a single "buddie," with the laborer working in the well-lighted mill building, but with all of the din and confusion, to say nothing of the customary poor ventilation. If circumstances had permitted my giving all of my friends similar treatment, I am conceited enough to believe that every one of them who saw the paper with the poet's fancy about the stars in the impenetrable darkness would cut it out and mail it to me with some such remark written across it as: "What do you think of that for pure bunk?"

Illinois Miners' and Mechanics' Institutes Suspended

Special Correspondence

The work of the Illinois Miners' and Mechanics' Institutes, for the coming two years, will be at a standstill. This is the result of Governor Dunne having vetoed the funds necessary for the work of the institutes at the last hour of the last day he occupied the office as the head of the State Government.

The House and Senate agreed on an increased appropriation of $31,600 for the coming two years, but the Governor's veto nullified their efforts. This act of the Governor in passing out of office has been generally regretted throughout the state. The common expression heard is that it is a great pity that the work is to be temporarily abandoned. All agree that the Illinois Miners' and Mechanics' Institutes, as an organization, was filling a great need in all industries.

The first center of instruction was established at Belleville on Mar. 18, 1914. From that time to Oct. 8, 12 other centers were established, in each of which a complete two-year mining course had been inaugurated. The average attendance at the different centers to Jan. 1, 1915, was 26 students. In that time 464 sessions had been held, and the work of establishing other centers had progressed rapidly.

The work of the institutes at the different centers, was ably assisted by the local school teachers, who gave their services free in teaching mathematics (in some places both elementary and advanced) and English for foreigners. This was notably the case at Collinsville, where C. H. Dorris, Superintendent of Education; A. E. Arendt, Principal of Collinsville Township High School, and the Misses Emma Harris and Melitta Harris, teachers in the Township High School, all gave their services free in teaching the above subjects. In addition to these, other teachers coöperating in the work of the institutes are the following: Kurt Busiek and H. G. Schmidt, Belleville; H. L. Kell, Benton; C. A. Chatten and R. G. Crisenberry, Carterville; W. H. Creed, Caseyville; George W. Solomon, Gillespie; Clarence Bonnell, Harrisburg; H. L. Heath, Ivan A. Palmer and T. H. Schutte, Herrin, and M. B. Coker, Troy.

On Apr. 6, 1914, less than seven weeks after the establishment of the first instruction center, a short six-weeks' course was given at the University of Illinois under the auspices of the institutes. This six weeks' course included the same subjects taught in the full two-year course. There were 33 students enrolled in this course, of whom four went through the entire course, while the others took special subjects. The same short course was held this year, June 6 to July 16, and 24 mine employees completed the whole six weeks of the course at the university.

In this connection, one has only to consider the scarcity of work at the mines during the past winter and the necessary expenses to each student for railroad fare and board, which may be roughly estimated at $50 for the six weeks, to understand that the Illinois Miners' and Mechanics' Institutes supplied a great need. If the work had been continued, it is probable that the short course for next year would have been divided into two or more classes held at the same time. It may be added that the men who attended the short course at the university were nearly all from centers where the two-year course was inaugurated.

It is to be deeply regretted that educational work of such a wide range and which was becoming firmly established throughout the state should be cut short by political intrigue. In every center there were found students who were exceedingly anxious to get an education. They were men who in their younger days had neglected the opportunities for education and others who since leaving school had let slip what they had learned. These all now realized the value of education in their daily work and were anxious to retrieve the time they had lost.

In the report for 1914, mention is made of the names of 58 men who attended every meeting of the institutes' courses in which they were enrolled. It is to be hoped that the enforced discontinuance of the regular work of the institutes will not discourage the teachers who volunteered their services so generously last winter and that much of the instruction work will be continued until the State of Illinois secures a governor who will be willing and able to befriend the miners and other industrial workers in their efforts to make themselves more proficient.

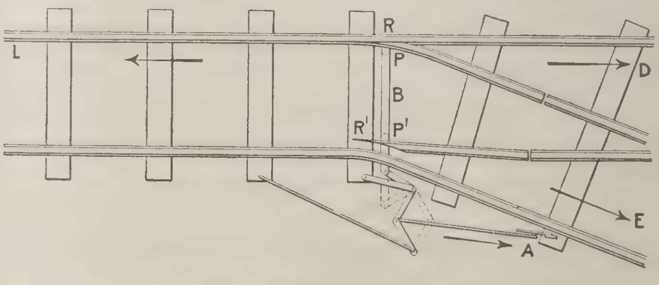
In closing permit me to say that it is a poor commentary on democratic rule and administration in the State of Illinois that the paltry sum of $31,600 appeared too large to be devoted to the work of instructing 80,000 miners in the state during the next two years. Such a proceeding surely manifests a penny-wise-and-pound-foolish system of economy. The miners of Illinois will certainly protest the action of their Governor, and two years hence will make their voice heard in the Legislature by the election of efficient state officers. In the meantime let us hope for greater enlightenment and a greater appreciation, on the part of the executive, of what is needed for the progress of the industrial workers throughout the state.

An Automatic Switch

By W. G. Burroughs*

The automatic switch here described is being used successfully on the trestle to the tipple and at all motor passways inside and outside of the Black Diamond coal mine, Berne Township, Athens County, Ohio.

The automatic switch which is shown in the illustration is that used on the trestle to the tipple. In the figure, the switch is set so that the main track *L* up which the loaded cars come from the mine, is connected with the track *E* on which the empty cars stand after being dumped. The switch point *P* is in contact with the rail *R*, and the switch point *P′* is separated from the rail *R′*. The switch points *P* and *P′* are fastened to the steel bar



A SIMPLE AND PRACTICAL AUTOMATIC SWITCH

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*Mt. Hope, N. Y

B, which in turn connects with the system of levers as shown in the diagram.

Each electric mine locomotive has a steel arm projecting on the right side near its forward end. The loaded trip coming from the mine nears the switch, which it will be remembered is set to connect the main track L with the empty track E. The man operating the locomotive uncouples the loaded cars from the locomotive just before reaching the switch points P and P′. The locomotive passes onto the sidetrack E, and just as its entire length is on this track, the steel arm on the locomotive's side strikes the lever arm A, which through the system of levers and the bar B, shown in the figure, throws the switch points. The switchpoint P moving away from the rail R and the switch point P' moving against rail R' thus connect the main track L with the track D, which leads to the dump on the tipple platform, allowing the loaded trip to proceed onto track D and to the dump. The switch points are now left connecting the tracks L and D.

The loaded cars are discharged on a crossover dump and by gravity are switched onto track E at the right and lower than the main track LD. Here the empty cars are coupled together, and the locomotive is attached. They then start back for the mine, moving along the track E. As the locomotive nears the switch points, its weight forces the latch back into its initial position, connecting tracks E and L. The locomotive and empty cars pass onto track L and proceed to the mine. The switch is left connecting tracks L and E, and ready for the operation to be repeated.

T. L. Smith Co. Buys Excavator and Loader Rights

The T. L. Smith Co. announces that it has purchased the exclusive manufacturing and selling rights of the Albrecht excavator and loader and is in a position to make prompt shipment of machines.

For over five years the inventor of this machine, John H. Albrecht, has tried to market his device. A number of machines were sold and are being successfully used in different parts of the United States. Lack of capital, however, prevented the successful development of the business. Realizing the immense field in which this machine could be used to advantage, the T. L. Smith Co. took over the entire business of the Albrecht Excavator Co.

THE ALBRECHT EXCAVATOR AND LOADER

The Albrecht excavator and loader is well described by a man prominent in engineering circles: "This machine is halfway between a hand shovel and a steam shovel and will do the work of both." Only two men are required to operate the equipment—one to handle the scraper and one to run the machine. A 12-hp. horizontal gas engine of the heavy-duty type provides ample power to dig and load 20 cu.yd. of material per hour. This device will dig at a distance of 100 ft. from the machine and at any desired depth for ordinary excavations at the rate of about one round trip per minute. This loader will load as fast as 10 men. It will dig at any point either above or below its level and over a big area.

The Albrecht excavator and loader can be used for excavating for heavy foundations, basements or drainage ditches, for back filling, for loading sand, gravel, coal or coke and other similar materials from a stockpile.

Additional data and information can be secured by writing to the T. L. Smith Co., 1110-A Thirty-Second St., Milwaukee, Wis.

Testing the Efficiency of Safety Catches on Cages

Among the many precautions taken to safeguard the lives of the anthracite mine workers of Pennsylvania is the testing at least once a month of the safety catches on the elevators, or mine cages, used in shafts. These tests are now a legal requirement, but they were originally instituted by the operators.

The test consists of dropping the cage, fully loaded with coal, to see that its safety catches are in working order and capable of preventing a fall in case the rope should part. For carrying out these "drop tests" a special release hook coupled to the end of the hoisting rope is provided. When the trigger of the release hook is pulled, the cage depends on nothing but the safety catches, but its fall is stopped within a few inches. The powerful catches act promptly and grip or bite into the guides tighter and tighter until the descent is stopped.

Naturally no men are allowed on the cage during the tests, but the loaded cage itself weighs about three tons, and this great weight is all exerted in making the safety catches grip the guides. The tests are always witnessed by responsible officials of the coal companies, and reports of the results are submitted to a state mine inspector.

Coal-Mine Ventilation

The Sept. 4 issue of *Coal Age* will be devoted to the subject of mine ventilation, and we earnestly invite all our readers to contribute articles for publication in this special issue. We particularly desire detailed descriptions of new mine-ventilating plants, and we will be pleased to publish the results of tests on fans or other ventilating equipment. Articles accepted and published are paid for at a liberal rate.

The Labor Situation

SYNOPSIS—The miners in Ohio are suffering from slow time, idle mines and strikes. Other work is being offered them in Cleveland, Ohio, and mining work in Pennsylvania and Kentucky. The railroads blame the miners for wanting an undue wage, and the miners blame the railroads for charging undue rates.

The poverty among the Ohio miners is increasing. The resumption of the Blaine mine of the Lorain Coal & Dock Co. on July 26 pending the installation of mine scales was more than balanced by the shutting down of the mines of the Sunday Creek Co., No. 266 at Hollister and No. 254 at Jacksonville. In the first of these mines 400 employees find work, and in the other two 500 and 300 respectively are laid off. Only one mine of the Sunday Creek Co., No. 268 at Rendville, is still in operation and now the Blaine mine is again on strike.

The citizens of Ohio are quite generally aroused and are giving liberally. Columbus, Cleveland, Cincinnati and Piqua have been extremely generous. Carloads of food are arriving at the mines and are being distributed by the National Guard.

On Aug. 4 work for 153 men from Glouster, Nelsonville and Chauncey in the Hocking Valley district was provided in various Cleveland, Ohio, plants. The men were brought by a special train to that city, being conducted by J. M. Roan, the "Ohio mining inspector," and lodged in the armory of the Fifth Regiment of the Ohio National Guard, receiving their supper and breakfast at the cost of the militia. In the morning they were conducted to their work by Boy Scouts.

Work Available in Parts of Western Pennsylvania, Kentucky and West Virginia

The Republic Iron & Steel Co. of Youngstown, Ohio, has offered to give work to 150 men in its mines in Pennsylvania and is paying the transportation of the men applying for this work. W. P. Lear, representing the Pond Creek Coal Co., of Stone, Ky., has also offered to give work to 100 miners who are out of employment. Apparently the men did not want to work in nonunion mines and refused to accept work at Stone.

Mr. Lear said his men averaged a little more than $3 per day and that 55c. was paid for room work and 60c. per ton for entry work. Every man can get all the cars he can load. The company was willing to pay the transportation charges of the men and their families. A meeting was held at Hollister, near Glouster, at which about 125 men were present. Some seemed inclined to accept the offer and doubted if the union was worth the sacrifices demanded, but these men were not in the majority and allowed themselves to be whipped into line.

A coal company in Fayette County, W. Va., has sent a call to the distributing branch of the United States immigration service, asking for 1000 miners and promising good wages and steady work. It has been suggested that the recruiting be done in Ohio. Obviously there is need, as often happens, for a redistribution of labor in the coal industry, though much of the trouble in Ohio is due to ill-regulated wage rates and railroad rates and only a part to the quality of the coal.

Much has been said about an unjust discrimination against Ohio coal. As a matter of fact, the fuel which Ohio produces is not as good as that from West Virginia, but that is no reason why it should not be used in Ohio to the exclusion of other coal, if wage scales were kept to a normal level and railroad rates were maintained on the same low ton-mile basis as in adjoining states where the transportation companies are faced with greater engineering difficulties in construction, maintenance and operation. Nor is it reasonable that coal outside Ohio should pass over the rails in that state at a lower mileage rate than Ohio coal. Little will be done by using stickers reading, "Buy Ohio Coal." The economic interest will and should always overcome mere sentiment.

However, it is apparently not true that the Ohio miners are starving, but it is certain that their conditions are severely straitened. During the past week bulletins have been posted in Athens, Nelsonville, Wellston and Jackson in the Hocking Valley district calling for 100 men to work on the Chesapeake & Ohio Ry. extension near Portsmouth, Ohio, for wages ranging from $1.65 to $2 per day. Yet the only man who reported for work was drunk when he applied.

A number of miners employed at the Blaine mine of the Lorain Coal & Dock Co. in Belmont County struck Aug. 7 for the second time in 30 days. The men demanded that the company allow them two checkweighmen, which was refused. By the terms of the settlement of the wage scale made about two months ago, when the 14-months' strike was brought to a close, the strikers will be compelled to pay a dollar a day each as a fine if the strike is contrary to the agreement. The contract provides that a strike cannot be called unless the operators fail to pay wages when due and cannot give a satisfactory explanation.

Coal Operators Will not Join with Railroads

The railroads have asked "that a commission of Ohio coal operators join with a committee of the railroads in that state in an informal conference with the Interstate Commerce Commission to secure, if possible, their consent to a general inquiry on their own initiative into the conditions in Ohio, West Virginia and Pennsylvania for the purpose of outlining the differentials to competing markets in the West, North and Northwest that should apply from the competitive fields of Ohio, West Virginia, Kentucky and Pennsylvania, such action to be without prejudice to any other action the Ohio coal operators may deem necessary to take."

The operators have rejected this proposal as the railroads do not admit in a preamble that any readjustment of rates is necessary nor do they disclose what would be their attitude before the Interstate Commerce Commission.

The railroads are evidently aroused by the labor situation, but the consensus among the officials is that to lower freights would only beggar the railroads without remedying the condition, for the roads in West Virginia would only make further cuts to meet the competition.

The Norfolk & Western R.R. sought consent to be dismissed from the case brought before the Ohio State Industrial Commission, declaring that it is its intention and desire to haul no Ohio coal, being able to secure all the traffic desired from the West Virginia field. It might have favored the Ohio people with this singular stand when asking for a charter in Ohio to acquire its right-of-way. Of course, the commission refused to dismiss the case against the railroad.

The railroads have been asked to act voluntarily and reduce rates to accord with the decision against the Hocking Valley Ry., but such reduction would not satisfy the miners and operators. The rates were then cut 15c. between Armitage and Toledo, the old rate being $1 per ton.

Hocking Valley Ry. Wants Complaint Dismissed

The Hocking Valley Ry. desired that the complaint against it be dismissed on the ground that it recently filed this rate in a new coal tariff. A few weeks ago the Supreme Court approved the reductions just mentioned, which were ordered four years ago by the Utilities Commission, and the Hocking Valley Ry. hurriedly filed these new rates so that it could plead that the company was entitled to keep them in force for a year from the date of filing. The miners' complaint predates the filing of this new tariff, and that introduces a complication. The Utilities Commission decided that the Hocking Valley should remain a party to the action for the time being at least.

Illness of witnesses and general lack of preparedness forced a delay in the investigation, and it will be resumed on Tuesday, Aug. 17. Practically only two witnesses were questioned—General Freight Agent H. Q. Wasson and General Manager M. S. Connors of the Hocking Valley Ry. Mr. Wasson testified that coal is carried from Armitage to Toledo for $1.25; of this the Toledo & Ohio Central Ry. gets 71c., the Hocking Valley Ry. 44c. and the companies owning the Ohio River bridges 10c. Coal is carried from the Kenova district to Cleveland for $1.02; 37.2c. of this goes to the Hocking Valley Ry. and 59.8c. to the Norfolk & Western Ry., and 5c. is charged for loading.

Attorney Harry Arnold, for the Sunday Creek Co., examined both witnesses. From General Manager Connors he sought to show the cost of transportation of coal on the interstate shipments and the amount of work caused in handling the domestic product of the Ohio mines. Later he will attack this showing as tending to prove that the rate on the Ohio product is far too high.

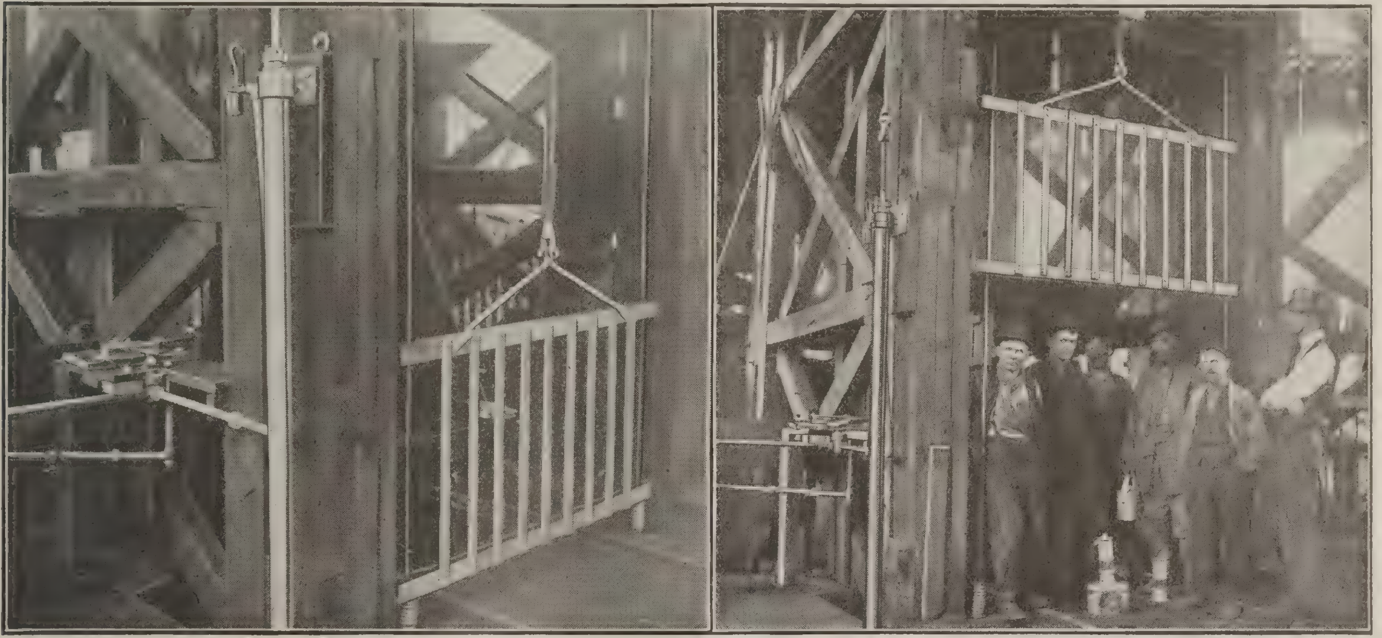
The fight thus far has been almost wholly between the Sunday Creek Co. and the Hocking Valley lines. That line of action was adopted because the Hocking handles most of the coal and its showing would make the most striking evidence.

The items relative to labor troubles in other states are of less interest than those in Ohio and will be reserved for publication in the next issue.

New Apparatus and Equipment

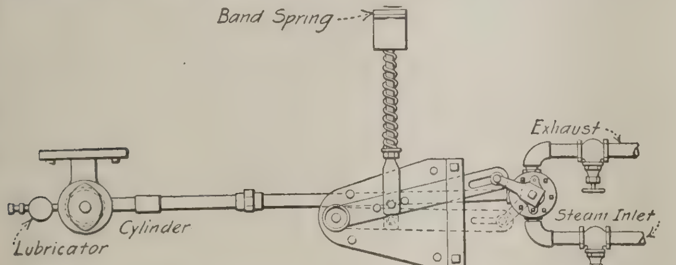
A Steam-Actuated Shaft Gate

The shaft gate shown in the accompanying drawings and illustrations has been designed by Thomas H. Tudor and Uriah M. Lenhard, two officials of the Pittsburgh-Westmoreland Coal Co. The gate shown in the photograph has been in operation for more than four months, with no expense for repairs or attendance since its installation, aside from the daily filling of the lubricator.



THE SHAFT GATE IN THE CLOSED AND OPEN POSITION

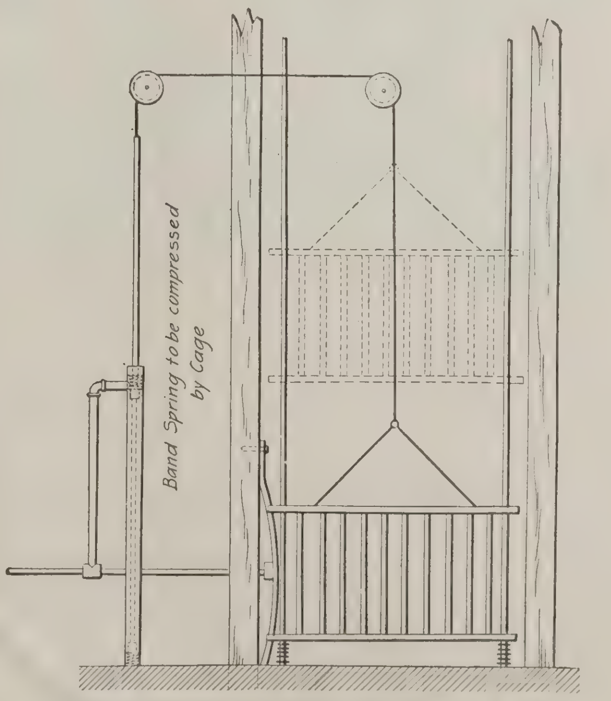
This gate is so arranged that the cage on coming to the landing throws the lever of the controlling valve, admitting steam or compressed air to the cylinder. This forces the piston down, lifting the gate through the medium of a cable passed over suitable guide pulleys. Suitable springs placed in the cylinder above and below the piston prevent it from striking the lower head when the gate is being hoisted or the upper head when the steam is exhausted.



THE VALVE MECHANISM CONTROLLING THE GATE

When the cage is raised or lowered from its normal position at the landing, the lever of the control valve is thrown in an opposite direction and the steam or air exhausts from the cylinder, allowing the gate to return to its normal position.

The time required to raise the gate or to allow it to settle to its normal position may be controlled by the action of two valves, one in the steam supply and the other in the exhaust pipe. These are adjusted until the desired time of raising and lowering has been secured, when they are allowed to remain in this position and by their throttling effect govern the speed of travel of the piston in the cylinder and the gate to which the piston is attached.



ARRANGEMENT OF CYLINDER AND GATE

This device is simple in construction and not liable to get out of order. It has received the approval of Alexander McCanch, mine inspector of the first bituminous district of Pennsylvania. It fully meets the requirements of the Bituminous Mining Law, as embodied in section 1, article 8.

The device is so constructed that if the cage is raised or lowered 12 in. from the landing position the gate immediately closes. This renders it practically impossible for an accident to occur at the ground landing.

The fact that the gate rises vertically instead of swinging horizontally is a great saving of time and space. With this device it is unnecessary to crowd the miners back from the cage entrance in order to open the gate or again when the gate is to be closed. As the device acts promptly and positively upon the arrival or departure of the cage, it saves considerable time, both of the cager and of the miners being hoisted or lowered.

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The Kincaid Stoker

A type of stoker operating on the principle of spreading has been placed on the market by the Kincaid Stoker Co., 507 East Pearl St., Cincinnati, Ohio. This device may be used with equal facility on either externally or internally fired boilers—any type which may be hand-fired.

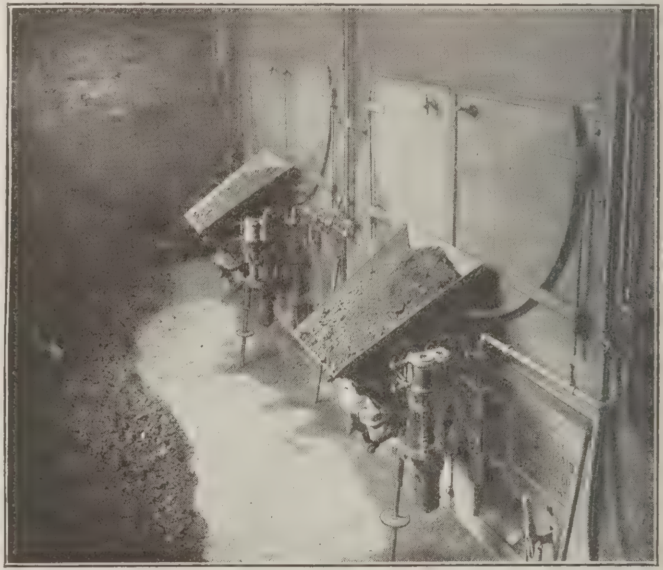
One of the secrets of successful hand stoking is the firing of small charges of coal at frequent intervals. The fire is thus not deadened by large quantities of green fuel, and the gases distilled are largely heated and burned and are not permitted to pass off as dense black smoke.

KINCAID STOKERS INSTALLED FOR BORDERLAND COAL CO., ARMEN, W. VA.

The Kincaid stoker employs ordinary stationary or rocking grates, and the fuel, once deposited on the fire, is not moved until it is disposed of as ash. Draft doors, dampers, etc., are handled precisely as with hand-fired boilers. The only change in the boiler setting necessary in the installation of this stoker is the substitution of a special lower boiler-front plate while the door jamb and arch are splayed or flared in. The entire stoker mechanism is mounted on the boiler front in place of the ordinary fire door.

A steam-driven ram pushes, or rather "kicks," successive charges of coal over the distributor plate, which spreads the charge in the furnace. Exhaust from this ram is made through a rectangular slot. The exhaust is so timed as to take place at the instant the charge of fuel is leaving the plate. The material is thus given a further kick by the steam.

The distributing plunger operates in a cycle of four strokes of varying feeds or intensities. The first or hardest stroke delivers coal to the rearmost quarter of the grate surface, the next over the next adjacent quarter, the third stroke over the next quarter, and the fourth or lightest stroke over the front quarter of the grate. The next stroke of the plunger, of course, starts a new cycle.



KINCAID STOKERS INSTALLED AT BORDERLAND, W VA.

The entire stoker mechanism, including the feed hopper, may be swung clear of the furnace opening to permit of cleaning or repair. A pair of crushing rolls in the bottom of the hopper reduces the coal from 8-in. lump and smaller to a size suitable to be spread over the fire. Mine-run coal may be fired if it does not contain too large lumps.

Fluctuations in Boiler Demand

Fluctuations in the demand on the boiler are accommodated by varying the number of charges of coal through a range of from 10 to 75 charges per minute. This variation is accomplished by regulating the number of strokes of the engine within a given length of time, and independently of the velocity of the piston, which remains constant in the cycle before referred to. The coal is spread evenly over the entire grate, building up a light, spongy fire, through which air passes readily and without difficulty. Since the coal is scattered evenly and in small amounts, the volatile gases are distilled at a practically uniform rate, which permits a perfect combination of these gases with the air. The result is that the gases distilled burn before they have a chance to become chilled by the boiler surface, and the furnace efficiency is consequently high.

This stoker requires no more headroom within the firebox than is needed for hand firing, nor does it require more space outside of the boiler than is taken up by the fireman. A space of 30x60 in. is required to swing the stoker around, while when in its operating position it takes up only 30x35 in.

The Kincaid stoker does not require expert manipulation. Inexperienced men have been taught to handle this machine in the course of one hour's time, maintaining a maximum and uniform steam pressure with ease. The work of handling the stoker is much less arduous than hand firing, and as the fire never needs hooking or slicing, the fireman is not exposed to the radiant heat from the open furnace door. Where mechanical means for handling coal are not provided, the low feed hopper is a decided advantage, as it is not difficult to fill this hopper with a shovel from the boiler-room floor.

The illustrations accompanying this article show two installations of Kincaid stokers for the Borderland Coal Co.—one at Armen and the other at Borderland, W. Va.

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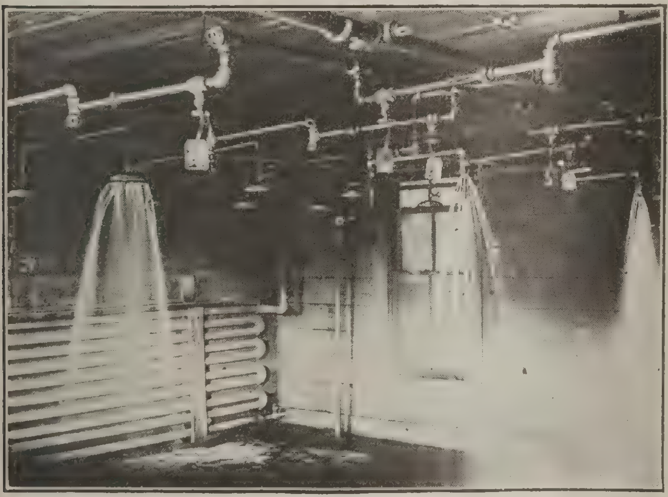
The Circle Shower

The efficient heating of water through the medium of steam is a problem which has been effectively solved by the "Circle water heater, or shower."

This heater is extremely simple. It comprises a globe having a vertical stem and a lateral outlet. A steam nozzle enters the vertical stem and discharges, downward against the bottom of the globe. The steam is thus caused to pass through the lateral outlet with a whirling motion. The water inlet is connected with the side of the stem, and the action of the steam as it is condensed by contact with the water produces a suction that draws the water inward, and thus aids any head it may have. The incoming water and steam are thoroughly mixed, and the water is heated.

In the operation of the apparatus, the valve in the steam line is first opened, the condensation is allowed to discharge, and the valve is closed. The valve on the water line is then opened until the required flow of water is secured through the lateral outlet of the globe, after which the steam is gradually turned on until the water is heated to the desired temperature, which will not vary to any extent with a given setting of the valves.



THE CIRCLE SHOWER IN THE BATH HOUSE

This device was specially designed by Everett C. Circle, of Coalton, Okla., chief engineer of the power plant of the Oklahoma Consolidated Coal Co., for shower baths, where an even temperature is necessary. It is substantially built, and it operates positively for years without repairs, trouble or adjustment.

The illustration shows a corner of the bath-house at No. 3 mine, where the showers were given their first trial. On the left is shown the type formerly used, which were installed so that all showers were heated to the same temperature, regardless of the individuals' desires. Frequent renewal of some of the working parts was also necessary. Actual tests show the Circle shower uses about one third of the amount of water used in the old type and with more effective results.

To the right of the center is shown the evenly distributed flow from the Circle shower, and in the extreme right is shown a Circle shower with the condensed steam being blown out, which is the first step in the operation.

The Circle shower operates successfully in a variety of ways. It can be used with hot water, instead of steam. It may also be used in connection with an ordinary bathtub or shower cabinet. In short, it is so serviceable and simple that it can easily be placed, with gratifying results, in any convenient part of a home or shop, where the necessary connections can be secured.

After a thorough test of the Circle showers, they are being installed in all the bath-houses of the Oklahoma Consolidated Coal Co. and are being adopted throughout the Henryetta field generally.

Recent Legal Decisions

Right to Rescind Contract of Purchase—A coal-mining company, by retaining a purchased air compressor for two years, waived any right to rescind the purchase on the ground that the machinery did not possess the capacity it was guaranteed by the seller to have. Right to rescind a purchase is lost unless exercised within a reasonable time after discovering the breach of contract relied upon as ground for rescission. (Kentucky Court of Appeals, Meek Coal Co. vs. George D. Whitcomb Co., 176 Southwestern Reporter, 354.)

Validity and Breach of Fuel Sales Agency Contract—A contract whereby a fuel company agreed to give a firm of brokers the exclusive sale of the company's coke output on commission was not invalid for want of mutuality, although it provided that the agency should continue as long as the firm's services should prove to be satisfactory and bound the company not to quote prices to anyone else, the agreement binding the firm to keep the company supplied with orders and to collect and guarantee all accounts for coke sold. But the contract, being indefinite as to duration, was terminable by either party on giving notice to the other. The act of the company, however, in quoting prices direct to buyers cannot be deemed to be an election to revoke the contract; it will be treated as a breach of the contract entitling the firm to recover damages therefor. (Kentucky Court of Appeals, Elkhorn Consolidated Coal & Coke Co. vs. Eaton, Rhodes & Co., 173 Southwestern Reporter 798.)

Coal Docks Not a Nuisance—A railroad, some time after the grant of a right of way from the United States in the city of Missoula, Mont., constructed thereon a coal dock. Residents in the neighborhood, who had received title to their property after such grant, sued the road for maintaining a nuisance, alleging that coal dust from the dock penetrated into their houses, etc. They did not allege that the dock was improperly equipped or operated. The Supreme Court of Montana held that the railroad was not liable, since the grant carried with it the right to maintain all kinds of property and do all sorts of acts necessary in constructing and operating the road, the term "railroad" fairly including all structures necessary to its operation. While cases involving coal docks are rare, the authorities are agreed that, when the grant of a right of way is made to a railroad without restrictions, it contemplates not merely the railroad as it is established in the first instance, but the road with its necessary apppurtenances as it may from time to time come necessarily to be. (Smith vs. Northern Pacific, 148 Pac., 393.)

Editorials

The Rawness of the Union

A foreigner some twenty-five or thirty years ago remarked, "I cahnt understand what you despise in a mugwump. He seems to me a pretty decent sort of a chap instead of a cad and a bounder." But then he had not lived through the period of conflict, and so his American friends did not argue with him but smiled at him in a superior way or laughed at his simplicity.

They themselves probably did not know why party gripped them in such unbreakable bonds. For few of them realized how their reasoning was colored by the past or perceived that they discussed politics with their hearts rather than with their brains. Most of the Northerners believed that they made a sorry return for the sacrifices of their fathers when they voted the Democratic ticket, and most of the Southerners felt they were untrue to their kith and kin and color when they voted for a Republican. Thus mugwumpery was an offense.

Since then the very name has died. Mugwumpery had no martyrs, of course, but nevertheless it spread and lived as a practice while dying as a creed. But before it became common any "yaller dorg" could run for office if he got his party nomination and could get the party votes. "Yaller dorgs" was what they termed them, for it was a period when strong language was common.

This was the rawness or soreness of the American Union after its phenomenal conflict, for you cannot have a struggle without some sore heads and unhealed "anatomies." And very like to it is the soreness of the labor unions and of the United Mine Workers of America.

The miners' union has gone through its conflict and all those who belong to the union have that uncomfortable feeling of strife which we all felt when the struggle ended at Appommatox. But as the one soreness has worn away so will surely the other.

The guilds in Great Britain, when fighting became no longer necessary for existence, developed into the most peaceful organizations, promoting benevolences, protecting the weak, educating the young, inspecting the products of their members, constructing stately buildings, regulating the customs of the industry and performing patriotic services. And the union, we trust, freed from the stress of conflict, will also lose its rawness, will gather to its councils constructive, sober-minded, conservative labor men and will serve alike the industry and the state. Most of the organizations of mankind, given time, tend toward benevolence and social helpfulness.

But for this we must wait and have patience. Without conceding anything which should not be conceded we should look hopefully forward to a newer condition. If the leaders of thrift, morality and prudence continue as of late to gain ascendency in the union, that organization may conceivably be more generously fruitful than it has ever been destructive.

Among the hopeful things we can say about the United Mine Workers of America is that it has rarely been a grafting concern and sold immunity from strikes for money like the unions in the building trades. It has made almost no one rich. Its worst feature is its unrelenting hostility, its brutal treatment of mugwumps—whether they be moderates in the union or independents without; its animosity to corporations—be they unconscientious or philanthropic; its tendency to be always fighting. These are its rawnesses which are the outcome of its past; but history suggests despite its contradictions that the cause of the blister being removed, it will not be long in healing.

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Progress in Mechanical Mining

History is not so much a chronicle of events as a record of the way in which those events impressed themselves on the people who wrote the history at a time roughly a decade after the events happened. As the philosophers would phrase it, history is subjective rather than objective. It represents not what people did so much as what they thought they were doing or had done.

If we pick up one of our national histories and try to trace the record of our mechanical development we find that the American intelligence rose to a great height in the middle of the last century and then mysteriously slumped away, till now there are no inventive geniuses left.

Every child learns about Elias Howe, the improver of the sewing machine in 1846, of C. H. McCormick, who invented the reaper in 1831, and of S. F. Morse, who in 1837 made telegraphy a success. Amasa Goodyear's improvements in rubber manufacture in 1844 and Cyrus W. Field's submarine cable in 1854 are all friends of our childhood days. So even is Dr. J. W. Draper for his work in establishing the art of photography. All these men get generous credit; sometimes some of them perhaps get a trifle too much, for it is hard sometimes to differentiate improvers from original inventors.

But while "there were giants in those days" history records little about others who have lived since—and yet, you say that there are others and that never was American invention so marvelous as today. Why then does the school history overlook these advances and tell us solely about statesmen and soldiers in the sixties and about politicians and statesmen thereafter? For this reason: History does not relate facts—only our attitude toward them.

As a result, inventive genius receives no honor, nor does it often receive even an appropriate pecuniary reward. The man who first schemes out a revolutionary improvement rarely makes money. The firm that exploits the invention does that. The inventor is entirely forgotten. The mining profession is just like any other. The new developments are unconnected with any names except those of the companies that purchase the patents and make the articles for the trade.

And even then it is considered the right thing to put on the soft pedal when we record the achievements of the new machines, as if the duty of the editor was to "damn with faint praise" every meritorious discovery. The reader also, trained to condemn the appearance of commendation of something sold for profit, is anxious to see that everything in a technical paper shall refer to subjects from which no one can earn a dividend. This animus has kept alive a lot of more or less fossil mining subjects. The publishing of them cannot possibly enrich anyone; therefore they are fit matters for publication.

We are only a few steps removed from the superstitions of the past. We are still in our hearts the victims of caste. Geology is a study from which a man can hardly make a living. It is unpatented, unpatentable, unsaleable—so it is a worthy study, almost on a par with astronomy and philosophy. It is the caste study of coal mining, but it won't cut coal. It is the dullest, slowest tool that the coal-mining journals exploit. It hardly makes in any way for efficiency; and so, being so cleanly immaterial, it is the very dean of mining—respected and venerable, but hardly able to support itself unaided.

To illustrate the unfortunate attitude which is growing on us, Secretary Lane's "Invocation to the Flag" might be introduced. Written as a general manager's note to his many employees, it is a splendid and stirring appeal to patriotism and loyalty and might well find imitation in "house organs" published for the benefit of employees. It certainly is a tribute to the altruism which is the glory of our civilization.

But the invocation is about to be placed in the schools, and it will there serve mainly to inculcate the idea that the Stars and Stripes represent nothing else than the people who wear the governmental dog collar—and muzzle. It may well be admitted that some of those in the government service are splendid idealists. But so also is the man on the street, the inventor, the lower-caste person who does not hold a government job. Does not the flag also represent him?

In fact, when read to the general public, for whom it was never intended, the invocation is only one mite less bad than that other unfortunate utterance of the Secretary of the Interior published in *Coal Age* on page 634 of Vol. 7. It appears that this created so much animadversion that its very publication in our columns, even with reprobation, has been regarded by some as an offense.

It had precisely the same fault as the "Invocation to the Flag," in that it magnified overmuch the work of the federal civil service. The public is being trained to believe that the only service worth while is the federal and looks with suspicion on all improvements and advances made by individuals. The chief work of government bureaus is to control industry rather than to lead it, and it is really surprising to note that the public admires the bridle rather than the horse which wears it.

A little generous recognition of the inventors of industry would do much to make a too often unprofitable occupation at least honorable and worthy of our aspirations. It would be well to suggest that our readers cast over in their minds the names of the inventors of improvements and developments of mining machines and equipment. In most cases they are hidden in complete obscurity. No seven cities are competing for the honor of their birth.

The socialist tells us that the great improvement in the building up of the world is the more equitable distribution of the receipts of capital, despite the fact that this distribution has changed but little in centuries and will probably never be perceptibly different to what now obtains, no matter whether the capitalist is a man, a municipality or a state.

The great change has been wrought by the inventor. Give the man who believes that the great advances have resulted from political activity a choice of being bounced along slowly in a box known as a sedan chair, like a rich man of a century or so ago, or of traveling in a seat on a railroad train comfortably and at express speed, and we know what his choice will be. The comfort of the workingman has not come from your politician or statesman, but from invention; yet our school histories, our magazines and even our technical journals are disposed to forget that we have any inventors.

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As the Miners' Union Develops

One cannot avoid seeing hopeful signs in the labor movement, no matter how little of an idealist one may be. The miners are not without a constructive program, though it must be confessed that they and the operators, and the press of both, lay too much stress on the purely destructive and aggressive attitude within the industry.

The constructive interest shown in Illinois and Indiana in favor of a restricted competition, the desire to protect the operators in Illinois against the unfair practices of coöperative societies, which only pretend to pay the union wages, the fight in Ohio for fairer freight rates so that capital can receive a price for coal permitting the payment of the present schedule of wages, the coöperation in Wyoming, Illinois, Texas, Oklahoma, Kansas, Iowa, Missouri and Arkansas in securing mine safety and first aid, and the recent stand for the settlement of the quadrennial or biennial disputes without strikes are one and all signs of a worthy spirit.

They show that labor in coal mining realizes that there is a greater solidarity than merely that of labor. No solidarity is safe but that which concerns the whole industry. If the miner should burn down all the coal works, he would find himself farther from prosperity than he is today. He can easily cripple his employer by unreasonable action, but he will find, as he has recently in Ohio, that though the mine owner grumbles loudly at the heavy hand of the miner, that hand has after all been most greivously laid on the person and property of the miner himself.

Slowly a larger solidarity is being learned, and it is interesting to note that John P. White, the president of the United Mine Workers, rarely forgets it and always seeks, though sometimes vainly, the way of peace. Of course, when he demands too much a struggle must come, but he never deliberately seeks such an issue for the sake of showing his strength or gratifying his pugnacity.

If a glance at his straightforward countenance is not enough to assure one of his unquestionable honesty, his recent utterance is sufficiently convincing: "I have every reason to feel assured that the operators, like the miners, want to be fair. The public should not become alarmed at the stories of a strike nature, for the mission of the United Mine Workers is one of peace."

This statement is extremely conciliatory and shows that Mr. White appreciates the good purposes of the operators far better than some of those city journalists who exhibit themselves as the miners' friends and would increase their wages without paying any part of the bill.

Sociological Department

Replacing the Saloon in Mining Communities

By Charles R. Towson*

SYNOPSIS—The saloon breaks up the monotony of the life in mining villages, and to compete with it or to replace it, it is necessary to find a force of equal or greater social value. Such a place must be more than a house; it must be in a sense a home and have someone who will sustain and control its activities.

A coal operator who is also a philosopher said recently, "The saloons in our state will be closed in a few months, and we are glad of it, but we must have a substitute." The saloon must go. It has shown itself to be incapable of improvement. Long ago religious reform spoke the word; education has explained it, and now their great economic ally, business, will enforce it. But with all its destructiveness, the saloon furnished a center and rendered a service needed in every community.

The very nature of men calls for a place to meet, to talk and to be friendly in a democratic way. The saloon has always furnished more than drink. It has been a social center. The clink of the glasses is a social and a natural speech. The saloon with the drink must go, but the social impulse, the desire for comradeship, for the clink of the glasses, will remain.

What substitute for the saloon is available? Those communities will be wisest that most quickly establish as a substitute for the saloon, a place of friendliness and cheer—a place where relaxation and recreation may be had without the destructive influence of the saloon. If this can also be made a place of constructive value, for physical, moral and mental improvement, so much the better.

DECOTA, OF THE CARBON COAL CO., KANAWHA COUNTY, WEST VIRGINIA

The first mining village in West Virginia at which a Y. M. C. A. was established

Contentment Is Better than Diplomacy

Mining communities afford little chance for the right use of idle time; yet there are few places where there is more of such time available. Monotonous work is bad, but the monotony of idleness is worse. Both are enemies to happiness and efficiency. It is strange how little thought or money is put into changing leisure time from a liability to an asset in such communities. Some employers are finding ways to improve the leisure life of the workers and their families, but more have ignored the need.

VISITORS AND OFFICIALS AT OPENING OF BENHAM, KY., Y. M. C. A.

From left to right, standing on ground—White L. Moss, then vice-president and general manager, Continental Coal Corporation, recently resigned; Tom Booze, local secretary Y. M. C. A.; H. H. Asher; J. C. Acheson, chairman of Kentucky State Committee, Y. M. C. A.; Philo C. Dix, state secretary of Y. M. C. A. in Kentucky; W. C. Tucker, superintendent, Wisconsin Steel Co., Inc.; C. R. Towson, secretary of the International Y. M. C. A. at New York City; C. J. Hickes, welfare man for the International Harvester Co. From left to right, on the porch—H. F. Perkins, president of the Wisconsin Steel Co., Inc.; Dr. A. Gatliff, of the Southern Mining Co.; a representative of the Louisville Courier-Journal; G. A. Ranney and Cyrus H. McCormick, general manager and president respectively of the International Harvester Co.

Many workers move from place to place for no other cause than sheer monotony. Others move because they have so little to anchor them. One operator realizing this purchased a large number of parlor organs and sold them among his people, not because they could play, but to make moving more difficult. Miners and their families have been known to walk miles to reach a village where a musical fakir entertained on the street. No means had been offered in their own village for satisfying the legitimate desire for entertainment.

The groups hanging around the stations, stores and corners in our coal-mining villages are witnesses to the fact that industry has not considered the human needs as scientifically as it has those of its machinery, markets and finances. It is a fact that we are experts on machine efficiency, but novices in developing man efficiency; and this in face of the fact that the greatest asset unrealized as yet in coal mining is not the resources of the mine, but of the miners. Leisure time can be used to help men grow in knowledge, energy, loyalty and contentment, but to use this leisure successfully leadership is needed.

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EXTERIOR AND INTERIOR VIEWS OF Y. M. C. A. OF THE McALPIN COAL CO. AT McALPIN, RALEIGH COUNTY, W. VA.

The saloon has furnished a place of meeting and something of social intercourse, but its influence is not in the right direction. The substitute needed must not only furnish the place and the atmosphere, but positive and constructive leadership. Where can such a substitute be found?

Leadership Is Needed; Equipment Alone Will Not Assure Success

A place of recreation and social intercourse should be provided in every community. But this has often been done with disappointing results. Many employers have spent large sums of money for just such a purpose. For a time the employees and their families used it as intended; then lack of interest appeared, the property was carelessly handled, neglect and indifference took the place of the first enthusiasm. Gradually the men for whom the place was intended dropped away, and its use became limited to a small group of the office men. It is all too easy to find well-equipped clubhouses into which employers have put not only their money, but their heart interest as well, and yet the rank and file of the employees are missing, and the principal use of these buildings is for a weekly dance by a few "white collar" men and their families.

The point to be guarded is that such a place to be effective must be run upon a plan that fits the people, and back of that plan there must be a man. Leadership is essential.

Imagine a saloon without a saloon keeper! We wonder at the influence of the saloon in politics; but have we ever really analyzed the subject to discover just what it is that gives the saloon its power, its grip upon men? If the influence of the man behind the bar and the democratic plan upon which his institution is run could be transferred to a constructive basis, what a change would come in many communities!

TWO VIEWS OF THE BENHAM Y. M. C. A. FOR COLORED FOLK. THIS BUILDING WAS ERECTED BY THE COAL DEPARTMENT OF THE WISCONSIN STEEL CO., AN ALLIED INTEREST OF THE INTERNATIONAL HARVESTER CO.

A Place, a Plan and a Man

Imagine a place equipped to meet the needs of a community as a social center, also a plan for its use that fits the people, that recognizes their natural desires, and gives them a chance to run it themselves and a man to lead the work. Remember that, unlike the saloon, this place

CONSOLIDATION COAL CO.'S Y. M. C. A. FOR COLORED MINERS AT BUXTON, IOWA is established by mutual agreement of employer and employees, both having a direct interest in it; that the plan is determined by the men themselves, with the aid of the trained leader. Add to this the further fact that this leader is the representative both of the employees and the employer and has no commercial interest in either the place or the plan, but only a desire to be the friend and helper of every member of the community. Then we have some idea of what a constructive substitute for the saloon may be, and actually is, in scores of industrial centers, not a few of them coal-mining villages.

In the mining regions of Pennsylvania, West Virginia, Kentucky, Ohio, Iowa and Washington this work has been operated successfully. Some have doubted the efficacy of such a movement because of its avowed religious motive. But for more than thirty years it has been an ally of the railroads; it has been used by the United States Government in the Panama Canal, and in the reclamation camps of the West, and by the largest as well as by some of the small industries during the last decade; and it succeeds everywhere with every group of men, white or black, English-speaking or non-English-speaking, because its motive is religious.

Plan Does More Than Merely Consume a Man's Time and Excess Energy

It is more than a club; it appeals to more in a man than his desire for social intercourse; it takes hold upon his character life at the point where loyalty, integrity, contentment and real efficiency take root. It can be made an ally, not only of industry, but of every church, school, doctor and police officer in any place. It does not violate the creed of any church member nor supplant any other agency. The fact that a state and an international organization promote and supervise its work is a strong point, for this assures stability and a choice of trained leaders (secretaries). Yet each local organization is absolutely independent.

This plan was suggested to that philosopher-operator who wants a substitute for the saloon, and he agreed to put up two buildings at two of his mines, and two more miners' Young Men's Christian Associations will result. Of course before these buildings are erected it will be discovered whether the miners and their families want this feature in their community; but no group of industrial workers of any color or creed in any part of the country has ever turned down this plan when it has been presented clearly.

Some operators testify that drunkenness has disappeared; others say that the receipts of liquors through express agencies have been cut in half, and in some places saloons have been actually closed by opening a modern industrial type of Young Men's Christian Association. It is a substitute for the saloon, and something more.

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School Building in Anthracite Region

Eighteen new schools have been constructed during the last year in the five principal anthracite-producing counties of Pennsylvania—Carbon, Lackawanna, Luzerne, Northumberland and Schuylkill—at an aggregate cost of nearly $900,000. Although the greater part of the school taxes is paid by the anthracite operators, and there were many magnificent school buildings in the anthracite region before this year's construction, they and all other taxpayers welcome additional educational facilities. Many of the school buildings are utilized at night for the teaching of miners in their chosen work.

At Franklin in Carbon County a new school has been constructed, and in Lackawanna County there are five new schools—No. 7 at Carbondale, the new school at Archbald, the Wildcat school, also at Archbald, and the primary school at Jermyn. In Luzerne County have been added the Georgetown school of Wilkes-Barre township, the high school of Larksville borough, the Concrete City school of Hanover township, the G. W. Guthrie school of Wilkes-Barre, the high school of Nanticoke and the high school of Pittston. In Northumberland County there are three new schools—one at Marion Heights and two at Milton, one being known as the Grant school and the other as the central grammar school. Schuylkill County has a new school in Wayne township, the Marlin school in Norwegian township, the West Ward school in Coaldale and the Tamaqua school in Rahn township.

Two of these schools, those at Nanticoke and Pittston, cost over $200,000 each, and the G. W. Guthrie school at Wilkes-Barre cost $100,000. The aggregate cost of the list furnished by the State Board of Education at Harrisburg was $890,781.

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The Dark Days

By Walt Mason

(Written expressly for *Coal Age*)

The sun's a winner, all men know; without it green things wouldn't grow, of beauty there would be a dearth, and health would perish from the earth. Oh, if it ceased to light the sky, we'd soon be tired of life and die. These facts are bromides gone to seed—so plain that he who runs can read.

Yet when the sun won't take a rest, but scoots along from east to west, day after day, week after week, we have too big a grouch to speak. "This sunshine is the bully stuff," we say, "but plenty is enough; we aren't hoggish, Sol, old chap; don't send us all you have on tap, but save a little of your glow for winter, when we're having snow."

And if the clouds obscure the sky, responsive to our heartfelt sigh, and thunder rips around and roars, and lightning splits the whole outdoors, we chortle with exceeding glee, turn handsprings in our ecstacy.

And thus the business men should greet the dark days with a nosegay sweet. If things should always come his way, and there should be no dismal day, he'd tire of such an easy graft, and say, "I wish I had a raft of obstacles and ills that blight, to show that I am built to fight!" He'd have no chance to analyze his weakness or to strength get wise; he'd gain no credit, though he won all kinds of plain and fancy mon'.

For any man who's worth a dime detests good sledding all the time. He wants to show he is a chap who has a store of vim and snap, and where the spineless critter frets, he on his nettle bravely gets, and strips disaster of its hide, and cuts a swath a furlong wide.

Dark days are good for any man; they make him use his brains and plan, conserve his capital and learn to value dollars he may earn. So, Mr. Manager, don't fret when come the days, dark, blue and wet; look forth with calm, undaunted gaze, and say, "I like these gloomy days!"

Discussion by Readers

Misuse of Black Blasting Powder in Mines

Letter No. 1—While we all agree that there is much danger in the unrestricted use of black powder for blasting coal and rock in mines, this explosive has been blamed many times for results that come from its misuse and are due to the ignorance or foolhardiness of the man rather than the nature of the explosive. For this reason I have prepared this article on the uses of black blasting powder to show that accidents resulting from its improper use may be eliminated by its proper use.

During several years of service in mines, especially those of West Virginia, I have observed that the improper uses of black powder have contributed very largely to the numerous fatal and nonfatal accidents that have occurred and resulted in much damage to mining property. In most cases extraordinary care is taken in gaseous mines to avoid accidents liable to result from the improper use of so-called permissible explosives. Competent shotfirers are being employed, the best grade of explosive is selected for blasting and noncombustible material is furnished for stemming. Moreover, as a further precaution locked safety lamps are being used exclusively and the coal dust is kept thoroughly watered by various means that are adopted.

Let us inquire to what extent any precautionary measures have been adopted in many nongaseous mines with respect to preventing accidents that are liable to result in loss of life and damage to property from the improper uses of black powder. Experienced as well as inexperienced miners are permitted to perform the work when blasting coal with black powder, and in many instances accident results from overcharges purposely made to bring the coal down in easy-loading sizes. I admit that noncombustible material is being furnished for stemming in some though not in all of the mines. Many charges of black powder have been stemmed with fine "buckdust," as the machine cuttings are commonly called, which is highly combustible. Furthermore, watering of nongassy or dry-and-dusty mines, as a rule, is not as carefully practiced as is the case in gassy and dry-and-dusty mines. Copper-tipped tamping bars and copper-tipped needles are being used by some, but not by all of the miners.

It appears to me that in this respect the wagon is being placed before the horse and that it is necessary to adopt proper remedies. It seems reasonable that we can increase the safety of the mines by permitting only competent men to blast the coal when using black powder and by insisting on their using reasonable and safe charges, stemming with noncombustible material and using copper-tipped tamping bars and copper-tipped needles only.

By examining the annual reports of the West Virginia Department of Mines, it will be observed that a number of mine explosions in which many miners were killed were caused by the improper use of black powder; and the damage done to the mines and delays in operating after the trouble occurred has caused large losses to both operators and miners. Many roof falls that have killed miners have been due to the improper placing of shots too close to the roof, thereby making the latter unsound. Roof falls amounting to thousands of cubic yards annually and which must be removed at the expense of the operator are caused by pointing auger holes too near to the roof, causing it to become unsound and to fall.

Again, owing to the overcharges of black powder the mine atmosphere naturally is not as good as it would be if proper amounts of black powder were being used. Although the West Virginia mining law requires that miners shall not enter their working places until 20 min. has elapsed after firing a shot, this requirement of the law is in many cases not being obeyed. Of course, when miners rush to the face of the working places immediately after the coal has been shot they expose themselves to dense volumes of powder smoke, which if inhaled day after day will eventually affect their health and reduce their ability to perform a good day's work.

It cannot be denied that, in the past, black powder used by inexperienced mine employees has been the cause of mine disasters causing loss of life and injury to employees and damage to property. In my opinion, only experienced miners should be permitted to blast the coal, as it is necessary for the men doing such work to know by experience the amount of powder required to bring the coal down and avoid using an excessive charge. Men doing the blasting should be taught by men experienced in this work and should not be permitted under any consideration to fire shots until they can give satisfactory proof of competency to the mine officials.

Unavoidable mine accidents will happen, but avoidable ones caused by inexperienced miners blasting the coal should be eliminated. It is deplorable when we read annual reports that have been issued by the West Virginia Department of Mines to observe that fatal as well as nonfatal accidents have been caused by the carelessness of the miners; and many of these accidents can be attributed to the improper use of black powder by inexperienced men. Naturally, miners do not like to work in mines where accidents constantly occur. In many instances where accidents have occurred the mine was idle that day and perhaps for days previous, depending of course on the severity of the accident. The burden of these losses, financially and otherwise, must be borne by the miners and the operators.

To the astonishment of West Virginians, past history shows that mine disasters have occurred in what are usually termed "model mines." Investigations into the causes of these disasters revealed that blownout and overcharged blasts and blasting coal on the solid were the primary causes. If in future the blasting of coal with black powder is permitted to be done only by experienced miners, the mines will become safer for work, and as a result fatal and nonfatal accidents will be eliminated to a large extent and the safety of property enhanced.

Let us not forget that two things cannot occupy the same place at the same time; no more can we have safety so long as we permit danger to lurk within the mines. Only experienced miners should be allowed to do the blasting of coal and handle black powder, if we expect to eliminate one of the dangers lurking in coal mines.

KARL F. SCHOEW.

Huntington, W. Va.

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Removal of Powder Marks

Letter No. 1—A matter of grave importance to all miners and referred to in discussion by the National Mine Rescue and First-Aid Conference, held at Pittsburgh, Penn., Sept. 23-26, 1912, is the question of whether it is possible to so treat victims of powder burns as to efface the marks resulting therefrom. My attention was drawn to the statements made by Drs. J. J. Rutledge and W. S. Rountree, as published on p. 42 of Bulletin 62, Bureau of Mines. Dr. Rutledge stated the case of a man injured in a mine by the explosion of a blast that he, in company with others, had approached unwarned. This man had received 107 punctures of the skin, and in some of these could be seen through the skin particles as large as the end of a thumb. Otherwise, the man's physical condition was perfect.

In response to a member of the Hospitals and Safety-Station Committee as to whether or not it was advisable to wash such a wound, Dr. Rountree stated as follows:

> We have quite a number of injuries of this sort in our mining district. Long ago, men whose faces were blackened by explosion went through life that way. They were simply treated in a way, and the coal dust remained in the wounds. In the last few years we have never sent a man away with a black face after such an accident. With a salt solution and a stiff brush, every particle of coal dust may be removed. Sometimes the coal dust is buried so deep it cannot be reached with the stiff brush, but with a curette all particles may be removed. The only way we have been successful with these patients was to immediately anesthetize, scrub with brush or curette, wash with salt solution and dress with sterile bicarbonate or some other dressing. Sometimes, after a patient goes 24 hours or so the face swells, and many particles are shoved up and are thus much easier to remove, even at that time; but by letting them go so long, more infection is caused. However, such infection is not so dangerous as infection received on the surface. The use of a stiff brush destroys some tissue, but causes no scars, and practically all the dirt can be reached with the brush.

This statement of Dr. Rountree, to the effect that he had never sent a man away with a black face after such an accident, is interesting, inasmuch as many mining men know of numerous cases where patients have recently been discharged from hospitals as cured, but with blackened faces.

As I have stated before, it is a matter of grave importance to know whether such results are due to the carelessness or ignorance of the surgeons in charge. In either case, it is the right of the coal-mining industry to know the facts. If the treatment described by Dr. Rountree is efficacious and will effect the removal of the marks of the powder, there can be no excuse for the discharge of men from hospitals as being cured, while these marks remain to disfigure their faces.

Such a disfigurement is not only a handicap to the man himself, but advertises the occupation of coal mining as one of great hazard, while it also reflects on the intelligence or efficiency of certain hospitals. Let there be a discussion in *Coal Age* that will lead to a thorough investigation of this important matter.

RALPH W. MAYER.

Roslyn, Wash.

Need of First-Aid Instruction

I agree heartily with the suggestion that first-aid instruction should be given more generally to all mine employees, so that there might always be someone around who would know a few simple things that ought to be done in case of accident. All persons should know how to stop the flow of blood from an artery; how to rescue a drowning person; what to do to succor a person in contact with a live wire, or to resuscitate one overcome by gas.

The more general need for this work of instruction was deeply impressed on me a few days ago by an incident that occurred on the tracks in front of the tipple of the mine where I work. It was early in the morning as the men were coming to the mine. I was proceeding up the track toward the mine when the engine and cab of the coal train passed me at breakneck speed. I knew at once that something was wrong, as trains were never run on the coal siding at a speed greater than 20 mi. an hr.

On reaching the tipple, my fears were realized when I learned that a young boy, who was riding to the mine on the cars, had jumped from the train before it stopped. In attempting to cross the track ahead of the moving cars, he slipped and fell. Retaining his presence of mind, however, he succeeded in rolling clear of the track, except his left leg, which was cut off by the wheels at a point above the knee. The accident was witnessed by many of his fellow-workmen who were riding in the first car. They all realized that something must be done quickly to save the boy's life, but no one understood how to stop the bleeding which would soon result in death. They only thought of getting him to the hospital as quickly as possible, and the engineer and train crew were doing all in their power to shorten the time of the trip. But the boy died that night from loss of blood.

This is not the first case of its kind that has happened and I don't suppose it will be the last. We never know who will be the next victim of accident or when an accident will occur. Hence it is our duty to do everything possible to give first-aid instruction to all mine workers. It may happen that an opportunity will never offer to apply the knowledge gained of first-aid treatment; but this is no reason why everyone should not possess himself of sufficient knowledge to give such treatment to another injured by accident. An accident is always unforeseen.

Personally I think that the mining laws of every state should compel all operators to maintain at their plant at least a few trained men who are competent to give first-aid treatment in case of accident. The mining laws of many states require mine operators to keep on hand ready for use a supply of first-aid material; but how many of these laws say anything about the training of men in first-aid work and in the proper use of the material required to be kept on hand? I would ask, What good are tools or supplies if no one present is competent to use them?

JAMES T. REYNOLDS, Safety Inspector,
Houston, Penn. Aetna Life Insurance Co.

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Preventing Mine Explosions

Letter No. 5—In his Letter No. 3, *Coal Age,* July 24, p. 143, William Crooks criticizes the statement that appeared in my previous letter, May 8, p. 819, which reads, "As long as coal is mined, disasters must occur," etc. My original copy read "As long as mine disasters occur, there will be miners to be rescued." I presume Mr. Crooks would accept the latter statement without criticism, as it does not imply that these sad occurrences are "inevitable" in coal mining. The change in the wording came in the editing of my copy.

However, while it is true that mine explosions have occurred ever since coal was mined to any considerable extent, and probably will continue to happen for some time to come, it is undoubtedly the desire and hope of all mining men that mine explosions will eventually be eliminated and remembered only as matters of history. We will all agree that that time has not as yet arrived. I firmly believe that we still have some things to learn and understand relative to the causes of mine explosions before these will cease to occur.

The suggestions offered by J. Riley, May 29, p. 938, and Edward H. Coxe, July 3, p. 27, as well as those presented by Mr. Crooks, in his letter, p. 143, are all good and practical, as means of preventing or at least reducing the number of mine explosions, if the same are strictly followed. But I would ask, Will they eliminate such explosions? It seems to me that there are other things we must know and other causes we must understand before we can expect to successfully contend with the conditions that make mine explosions possible.

How much do we know in regard to the effect of strong air currents, and the greater or less amount of available oxygen in the mine air, and to what extent these are actual factors in the initiation of an explosion in a mine, as has often been suggested by John Verner, former mine inspector in Iowa? Again, do we thoroughly understand to what extent or in what way changes of temperature, barometric pressure and seismic disturbances create conditions favorable to explosions in the mine?

It must be acknowledged by a candid mind that efficient and competent men in charge of mines have not always been a means of preventing the occurrence of explosions therein. The records show that some of the most disastrous accidents have happened in mines that are well regulated and under the best possible supervision.

Again, well-regulated mines have been operated for a number of years by such competent and trained men, without the occurrence of an explosion, and yet a little later the mine, under the same management and subject to the same conditions, as far as can be ascertained, has suddenly been the scene of a disastrous explosion. In some instances the cause may be attributed to a human factor, but there are other instances in which this cannot be shown. I want to say that only when these conditions or causes are thoroughly known and understood may we expect that mine explosions will be eliminated.

JOHN ROSE,
Former District Mine Inspector.

Dayton, Tenn.

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The Pennsylvania Amendment

Letter No. 2—The recent changes in the mining law of Pennsylvania will be far-reaching in their effects and ultimately disastrous to every phase of the industry, if the predictions of many thoughtful men do not fail. By the passage of this amendment, as described in *Coal Age,* July 24, p. 145, the State of Pennsylvania has given up a substantial good and is groping for a shadowy illusion, supposedly something better.

Under the operation of the present law, the state exercises a degree of judicial and executive authority over the operation of the coal-mining industry that enables it to enforce important provisions relating to the sanitation of mines and the safeguarding of the health and lives of mine workers. Under that law, the state holds responsible for the enforcement of its provision the men who have been licensed by the state as being qualified for their official duty. Their qualification has been duly ascertained by an examination conducted by regularly commissioned officers of the state. The candidates in examination have demonstrated their knowledge of the principles and practice of coal mining and received the state certificate of competency required by law.

Since their enactment, these provisions of the law have been productive of a great advancement among coal miners, supplying them with a motive and incentive for study and resulting in the improvement of faculties that hitherto were dormant. This training has incidentally produced a higher grade of citizens. It goes without saying that a law the operation of which tends to produce more efficient workmen and to develop a higher standard of citizenship is of material benefit, not only to the coal-mining industry, but to the entire commonwealth.

It is a matter of general observation that one of the effects of the qualification required by law has been to develop mine officials of broader views. This necessary qualification has developed those faculties that have enabled men to realize that in order to produce the greatest results one must not only possess a working knowledge of his calling, but (what is of far more importance) a good knowledge of human nature.

By the amended law it would appear that the state has abrogated its power to adjudicate the operation of its mines. It may well be asked, Why has such a surrender of governmental right and authority been made?

In regard to the amendment operating to displace the legally qualified man, I am not apprehensive of such a result, since the qualified man is a profitable financial investment for every mine operator, and it is not logical to assume that such can or will be replaced by men of less technical training and ability. But it must be admitted that the abasement of the high standard previously maintained has a tendency to lower the dignity of the official position in the mine.

Unfortunately the amendment has substituted for a statutory supervision and control of mining operations an arbitrary and concentrated control invested in the mine owner or operator, who thus becomes his own law. Stated briefly, such a concentration of power is a menace to the bulwarks of our democratic government. In effect the amendment has placed the operator outside the pale of the state and made him a law unto himself. It must be admitted that nothing has been gained, but much has been lost to the miner by its passage. I believe the general opinion prevails that the amendment practically annuls the law, and the work of 35 years of constructive legislation that has materially benefited those employed in the industry has been destroyed.

In respect to the Workmen's Compensation Act, it should be observed that the act is optional in its provisions, while the amended mining law is positive and absolute. These two combined produce, incidentally, an unexpected result. Whether an operator elects to work under the provisions of the compensation act, he is still clothed with the absolute power conferred upon him by the amendment.

The benefit of the act to the workman is questionable. Should a company refuse to operate under the provisions of the act, an injured employee has no recourse except to common law, which at the best is uncertain in its results. On the other hand, if a company elects to operate under the provisions of the act, the payment of the price practically exempts the management from all financial responsibility for the safety of their employees, which then becomes a secondary consideration. The premiums paid to meet the requirements of the compensation act will not come out of the net profits of the operator, who will continue to demand the same returns on his investment as before, which is his legal right. The Workmen's Compensation Act is simply an insurance in which the operator pays directly the premiums on the policies of his employees. The operator will naturally reduce his premiums to a minimum by taking only the best risks and refusing to employ those who are physically defective, or who cannot pass a medical examination, or are advanced in years. Has the state provided for such a result?

A compensation act is a good provision and a necessary one, but its burden should not rest on any one class—it should be borne by the community as a whole, since all are directly or indirectly benefited by the labor of the men whom the act is intended to protect. However, when the operation of the act means the removal of the safeguards already in force and designed to protect human life, to say nothing of the annulment, practically, of the right to labor, it becomes an unmitigated evil.

In closing, permit me to suggest that the operation of the amended law will render abortive the authority of the local executives of the law—the mine inspectors, who are still retained in their positions at great expense to the state. In the bituminous field alone there are at present 28 mine inspectors, which means an annual expenditure of over $80,000 in salaries, besides office, traveling and other expenses.

It has been roughly estimated that the expense to the State of Pennsylvania incident to the establishment of the Bureau of Insurance in connection with the Workmen's Compensation Act, for the first fiscal year, will aggregate a half-million dollars. The results will be eagerly watched.

A. M. INER.

——, Penn.

Study Course in Coal Mining

BY J. T. BEARD

The Coal Age Pocket Book

Relation of Volume and Pressure of Air and Gas—For a constant temperature, the volume of air and gases varies inversely as the pressure supported. In this connection, pressure is often estimated as one, two, three, etc., **atmospheres,** meaning that the pressure supported by the air or gas is one, two, three, etc., times the normal atmospheric pressure at that place. This is commonly known as **Boyle's** or **Mariotte's law of volume.**

An "atmosphere" is sometimes incorrectly taken to mean normal sea-level pressure (14.7 lb. per sq.in.). Such a meaning of the term, however, would manifestly limit its application to sea level, or furnish an arbitrary standard inconvenient for use.

The term **"free air"** relates to atmospheric air at any elevation and for any condition. According to the above rule, when free air is compressed to two, three or four atmospheres its volume is reduced to ½, ⅓ or ¼ of the original volume, assuming the temperature remains constant. At the same time, the pressure or **tension of the air** is increased to two, three or four times the atmospheric pressure, whatever that may have been, or the free-air pressure, assuming always a constant temperature.

The **expansion of air,** by the same law, is accompanied by a fall of pressure, the **volume ratio** being equal to the inverse **pressure ratio,** for the same temperature. The pressure refered to here is the **absolute pressure,** or the pressure above a vacuum or zero.

Relation of Absolute Temperature and Pressure of Air and Gas—For a constant volume, the absolute temperature of air and gases varies directly as the absolute pressure.

Volume, Temperature, Pressure of Air and Gas—The relation of the volume (v), pressure (p) and absolute temperature (T), for a given weight of air or gas is expressed simply by the following formulas:

Const. Pressure	Const. Temperature	Const. Volume
$\frac{v_2}{v_1} = \frac{T_2}{T_1}$	$\frac{v_2}{v_1} = \frac{p_1}{p_2}$	$\frac{p_2}{p_1} = \frac{T_2}{T_1}$

The relations of volume, temperature and pressure of air and gas depend on two main conditions: 1. The gas may or may not be free to expand. 2. Heat may or may not be added or taken from the gas.

Addition of Heat—Two cases may arise, as follows:

(a) If the air is confined (constant volume) the rise in temperature is more rapid, since all the heat is then transformed into heat energy or **internal work,** and the pressure rises accordingly.

(b) If the air is free to expand (constant pressure) the rise in temperature, for the same addition of heat, is much less rapid. In this case, the air in expanding performs **external work** against the pressure it supports. A part of the heat added is thus absorbed in doing outside work, while the remainder, only, is available for internal work and manifest as heat energy, thus causing a lesser rise of temperature.

The Coal Age Pocket Book

Work of Expansion of Air—When air is expanded by the addition of heat the external work performed can be calculated in two ways, as follows:

1. On a heat-unit basis, by subtracting the heat absorbed, per pound of air, per degree rise in temperature, for constant volume, from the heat, per pound, per degree, for constant pressure; and multiplying this difference, which is the heat converted into external work, by the foot-pounds per heat unit; thus, since 1 B.t.u. = 778 ft.-lb.,

Heat, per lb.-deg. (sp. heat, const. pressure) ..... 0.2374 B.t.u.
Heat, per lb.-deg. (sp. heat, const. volume) ...... 0.1689 B.t.u.

Heat, per lb.-deg., available for external work.. 0.0685 B.t.u.

External work, per lb.-deg..........0.0685 × 778 = 53.29 ft.-lb.

2. The external work performed in the expansion of air, per pound, per degree, can be calculated, also, very simply by multiplying the volume of 1 lb. of dry air, at 1 deg. F., absolute, and 1 lb. per sq.in. pressure (0.37 cu.ft.), by 144, the number of square inches in 1 sq.ft.; thus,

External work, per lb.-deg............0.37 × 144 = 53.28 ft.-lb.

Adiabatic Expansion and Compression—When there is no addition of heat in the expansion, or no loss of heat in the compression of air or gas, the relations of volume, temperature and pressure follow other laws than those previously given. Such expansion or compression is described as **"adiabatic,"** meaning no passage (of heat) in or out of the gas.

In **adiabatic expansion,** there being no addition of heat, the increase in volume is at the expense of the internal energy and a fall of temperature is the result, which is accompanied also by a fall of pressure.

In **adiabatic compression,** there being no loss of heat, the internal energy is augmented by the heat of compression, and the result is an increase of both temperature and pressure.

Adiabatic Formulas—The following formulas express the relation of volume (v), pressure (p) and absolute temperature (T), for any given weight of air or gas, when expanded or compressed without gain or loss of heat. In actual practice it is only possible to approximate adiabatic expansion or compression.:

$$\frac{v_2}{v_1} = \left(\frac{p_1}{p_2}\right)^{0.7117} \qquad \frac{v_2}{v_1} = \left(\frac{T_1}{T_2}\right)^{2.469} \qquad \frac{p_2}{p_1} = \left(\frac{T_2}{T_1}\right)^{3.469}$$

$$\frac{p_2}{p_1} = \left(\frac{v_1}{v_2}\right)^{1.405} \qquad \frac{T_2}{T_1} = \left(\frac{v_1}{v_2}\right)^{0.405} \qquad \frac{T_2}{T_1} = \left(\frac{p_2}{p_1}\right)^{0.288}$$

It is important to observe that adiabatic expansion or compression always involves a change in temperature. Where the temperature is maintained constant, by adding heat in expanding, or extracting heat (cooling) in compressing, the change in volume is described as **"isothermal"** expansion or compression. In practice, it is only possible to approximate isothermal conditions in the expansion or compression of air or gas.

The application of the above formulas necessitates the use of logarithms.

Inquiries of General Interest

Space Occupied by Sized Coal

Kindly state the space required to store the different sizes of anthracite and bituminous coal in bins.

INQUIRER.

Dayton, Ohio.

The space occupied by coal stored in a bin depends chiefly on the specific gravity of the coal, and to some extent on the size to which the coal is broken.

The average specific gravity of anthracite may be taken as 1.5, making the weight of a cubic foot of average anthracite $62.5 \times 1.5 = 93.75$ lb. The space occupied by 1 long ton (2240 lb.) of solid anthracite is therefore $2240 \div 93.75 = 23.9$ cu.ft. It is estimated that mine-run coal, both anthracite and bituminous, will occupy about two-thirds more space than the same weight of solid coal. Therefore, the space occupied by 1 ton of mine-run anthracite would be approximately $23.9 \times 1\frac{2}{3} =$ say 40 cu.ft.

The specific gravity of bituminous coal varies from 1.2 to 1.5. Taking the average specific gravity of this coal as 1.35, the weight of 1 short ton (2000 lb.) of solid bituminous coal is $2000 \div (62.5 \times 1.35) = 23.7$ cu.ft. Therefore, a ton of mine-run bituminous coal will occupy approximately $23.7 \times 1\frac{2}{3} =$ say 40 cu.ft.

These calculations give the general rule that a long ton of anthracite or a short ton of bituminous coal (mine-run) will occupy approximately 40 cu.ft. of space in a bin.

In the sizing of coal, the larger sizes, as "broken" or "egg," may occupy slightly more and the smaller size of "chestnut" slightly less than the space mentioned. But the finer grades of pea, buckwheat and rice coal, owing to their greater purity or freedom from refuse, weigh lighter, and consequently require a somewhat greater space per ton, than that mentioned. However, these differences will not exceed 5 per cent., in any case.

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Effect of Storage on the Analysis of Coal

If bituminous coal is stored in the open for six months, and an analysis is made at the beginning and end of this period, how would the extent of deterioration be determined?

R. T. M.

Terre Haute, Ind.

The extent of deterioration in the coal would be determined by the percentage of loss in heat value. For example, the difference in the calorific values of the coal at the beginning and at the end of the period of storage will show a loss in heat units (B.t.u.). The percentage of this loss is then calculated from the original heat value of the coal.

This will be clearly understood from the following tabulated results of the experiments carried out by the United States Government for the purpose of showing the effect of storage on coal. Four different types of coal were selected for this purpose, as follows: 1. New River coal, West Virginia, as being the type of coal largely used by the Navy. 2. Pocahontas, Va., as being the type of steaming and coking coal used in the Eastern states. 3. Pittsburgh, Penn., as representing a rich coking and gas coal. 4. Sheridan, Wyo., as representing a sub-bituminous or black lignite, much used in the West. The results of the experiments were as follows:

Kind of Coal	Storage Conditions	Heat Value of Coal (B.t.u.) As Stored	After 1 Yr.	After 2 Yr.	Per Cent. Loss
New River, W. Va.	Run-of-mine coal exposed to air indoors; Portsmouth, N. H.	8,754	8,748	8,734	1 yr., 0.07 2 yr., 0.23
	Run-of-mine coal exposed to air outdoors, uncovered; Portsmouth, N. H.	8,775	8,760	8,722	1 yr., 0.60 2 yr., 0.17
Pocahontas, Va...	120-ton pile, run-of-mine coal, outside; Panama	8,794	8,762	....	1 yr., 0.36
Pittsburgh bed....	Run-of-mine coal, open bin, outdoors, Ann Arbor, Mich.	8,541	8,526	....	1 yr., 0.17
Sheridan, Wyo....	Run-of-mine coal, open bin 5 ft. deep; Sheridan, Wyo.	7,370	....	7,135	2¾ yr., 3.19
Sub-bituminous...	Run-of-mine coal, closed bin 5 ft. deep, Sheridan, Wyo.	7,370	....	7,094	2 yr., 3.75

The table gives a condensed summary compiled from the results of a large number of test determinations. To eliminate the effect of incidental impurities, the calorific values are calculated on a moisture-free, ash-free and sulphur-free basis. The results of the experiments show a loss in heat value of less than 1 per cent. for New River, Pocahontas and Pittsburgh coal stored in the open. The Wyoming coal alone of these four types showed any considerable loss in heat value during storage. This greater loss was undoubtedly due to the special character of the Wyoming coal.

In one case coal stored for two years at Key West, Fla., showed a loss in heat value ranging between 1 and 2 per cent. From these facts, and a large number of similar experiments, it may be stated that the loss in heat value of coal during storage is greatly overestimated.

Permit me, in closing, to add a few brief words regarding the storage of coal under water. Storage under these conditions undoubtedly preserves the heating value and the physical strength of coal; but such storage practically makes necessary the firing of wet coal and the consequent evaporation in the furnace of added moisture varying from 1 to 15 per cent., according to the kind of coal. This factor is an important drawback in many cases to the under-water storage of fuel.

On the other hand, submerged storage is an absolute preventive of spontaneous combustion and may on that account be sometimes justified; but unless the storage period is to be longer than two years, there seems to be no ground for storing coal under water merely for the saving in calorific value to be obtained.

PERCY N. COUPLAND,

New York City.

Examination Questions

Alberta (Canada) Examination, June 15-17, 1915

(*Selected Questions*)

Ques.—Water accumulates at the rate of 200 gal. per min. at the foot of a shaft 600 ft. deep. If power for pumping is available for 8 hr. in the 24, what will be the horsepower of the pump required to drain the sump?

Ans.—The quantity of water to be handled, in this case, is $200 \times 24 \div 8 = 600$ gal. per min. Then, using a column pipe having a diameter of $d_c = 0.25\sqrt{600} =$ say 6 in., the velocity head in a pipe of this size may be ignored, and the effective head under which the pump must operate is

$$h_1 = h + \frac{G^2 h}{800\, d_c{}^5} = 600 + \frac{600^2 \times 600}{800 \times 6^5} = say\ 635\ ft.$$

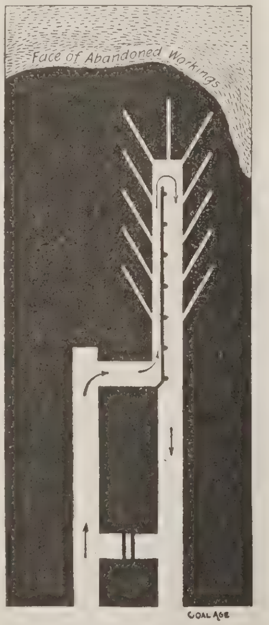
Then allowing 15 ft. for a sump, the total head is $635 + 15 = 650$ ft. Finally, assuming the efficiency of the water-end of the pump as 75 per cent., the required horsepower is

$H = 0.00034\, Gh_1 = 0.00034 \times 600 \times 650 =$ say 135 hp.

Ques.—A place is approaching old workings containing water. How would you work it, having due regard to safety? Describe some method whereby you could control a flow of water through a borehole.

Ans.—When approaching old workings containing water, a single heading should be driven in advance, as shown in the accompanying figure. A drillhole should be kept 20 ft. in advance of the heading, and flank holes should be driven in each rib, at an angle with the heading, about 2 yd. apart. A brattice should be erected from the last breakthrough to conduct the air current to the face of the heading, as shown in the figure. A sharp lookout should be kept for the first appearance of water or gas, and plugs should be kept ready for use in case one of the boreholes tapped the water in the old workings. Only safety lamps should be employed in this work.

In general, a plug driven well into the mouth of a hole will be sufficient to stop the flow of water. In case, however, it is desired to allow this water to drain from the hole and to control the flow, a heavy cross-timber should be set firmly into the rib, in front of the hole, and so arranged as to give the needed support to a pipe inserted into the hole. This pipe should be provided with a suitable cock to control the flow of the water. The end of the pipe inserted into the hole should have a slightly conical shape so that it can be driven tightly into a hole in the plug and form a watertight joint.



A PROSPECT HEADING

Ques.—Describe the operations in advancing a working place in a longwall face.

Ans.—In longwall working, when a miner enters his working place in the morning, his first duty is to examine carefully the condition of the roof and face of the coal and to reset any timbers that may have been displaced by the falling coal during the night. Having made the place safe for work the next step is to load out the coal, breaking those pieces that are too large to be loaded into the mine cars. Any loose slate that has fallen with the coal is thrown aside to be used for building packwalls.

Having loaded all the fallen coal and cleaned up the face, any new timbers required should be set in position. The work of undermining the coal should then be commenced, setting the necessary sprags and timbers as this work proceeds. After the coal has been undermined, all tools should be removed from the face to a safe place. Any back timbers may now be taken out and the packwalls extended as required. Before leaving the place for the night, the miner draws all sprags or other timbers supporting the coal at the face so as to permit the gradually increasing roof pressure to break down the coal during the night.

Ques.—A mine map shows that at one point in an entry the elevation is 742.5 ft. and at another point 100 yd. distant it is 748.5 ft. What is the average grade between these two points, (*a*) expressed in percentage and (*b*) expressed in inches per yard?

Ans.—The difference in elevation, $748.5 - 742.5 = 6$ ft., is the vertical rise of the entry in 100 yd. or 300 ft.

(*a*) The percentage of grade is, therefore, $6 \times 100 \div 300 = 2$ per cent.

(*b*) The rise is $6 \times 12 = 72$ in. in 100 yd., or 0.72 in. per yd.

Ques.—What quantity of water is contained in a sump 100 ft. in length, 7 ft. 6 in. in width and 5 ft. 3 in. in depth?

Ans.—The cubic contents of this sump is $100 \times 7.5 \times 5.25 = 3937.5$ cu.ft. The capacity of the sump if filled with water is then $3937.5 \times 1728 \div 231 = 29{,}454+$ gal.

Ques.—Humidity tests show that the percentage of saturation in the intake air is 40 and the return air 90. Parts of the mine being dry and dusty, what action would you think necessary?

Ans.—The question is not complete as it does not state the temperatures of the intake and return air without which no intelligent answer can be given. Intake air at 80 deg. F. and 40 per cent. humidity holds as much moisture as return air at 55 deg. F. and 90 per cent. humidity, which would not indicate any drying action of the air in passing through the mine. But an intake temperature equal to or greater than the return shows the need of humidifying the intake air.

Coal and Coke News

Harrisburg, Penn.

Ten of the largest and strongest casualty insurance companies of the United States have pooled their interests for the insurance of coal mines. In order to reduce to a minimum the risk of these companies, especially from the catastrophe hazard, they have organized as their medium of operations a Department of Inspection and Safety, and this has fixed its headquarters in Pittsburgh.

The offices of the associated companies have been opened in the First National Bank Building, and from these the inspectors and the consulting engineers of the Insurance companies doing business in coal mines in the state will direct their examinations of mines and coöperate with the insurance companies in fixing schedules or merit rates whereby a reduction in premium may be earned by any mine for every improvement which it may make for the safety of its operation.

It is expected that about Oct. 1 the State Compensation Board will announce the details upon which employers of labor may insure themselves against liability under the workmen's compensation act which goes into effect on Jan. 1, 1916. The regulations themselves will be most stringent. Whether the employer has a large or a small force of workmen, whether he is engaged in business alone or is part of a great corporation, whether he is backed with large or small capital, the paramount object is to make sure that in case of accident to an employee he or his beneficiaries will be compensated according to the law.

The proposal made that the employers that come under the act combine in a mutual enterprise, to make insurance as cheap as possible, has not yet been decided upon, but there is no doubt that out of it will grow an immense private corporation sustained by fixed contributions paid in by the members. The State Board, which consists of the Attorney General, Insurance Commissioner and State Treasurer, will see that the rates of payment will be sufficient to guarantee the solvency of the fund at all times. The state will make protection as liberal as possible. It will not permit extortion nor unreliability in any way. Aside from permission for the organization of private associations, the state will sanction the solicitation of business by regular insurance concerns unaffiliated with other businesses; it will permit a single employer to maintain his own insurance fund under adequate guarantee; and the state itself will establish a fund at rates that will enable employees to insure themselves at the lowest possible cost.

Details will be announced in time to give all employers abundant opportunity to study them and to decide which plan they prefer. The Compensation Board will profit by the experiences and mistakes of other states. Ohio seems to be regarded as the premier state in the compensation line, and it is likely that the Pennsylvania Board will consult considerably with officials from Ohio. Other states will also be consulted.

It is understood to be the desire of the Governor and of all concerned that no time be wasted in costly experiments, but that Pennsylvania shall examine the work in other states and begin at the point at which the pathfinders of those states have arrived.

PENNSYLVANIA

Anthracite

Middleport—The eastern Pennsylvania Collieries Co., a small company operating a colliery near Middleport, has closed its works, following a period of hardships, due to fire and a flooded condition of the mine which could not be overcome.

Tamaqua—The second annual field day and first aid meet of the Wentz allied companies comprising the Maryd, Hazle-Brook, Upper Lehigh, and Midvalley collieries, will be held at Hazle Park, Hazleton, on Aug. 27, 1915. Eleven teams will contest for the handsome trophy cup which was won last year by the Upper Lehigh inside team. The cup must be won three consecutive years to become the permanent property of the winners.

After extensive drilling operations the officials of the Silver Creek colliery, Philadelphia & Reading Coal & Iron Co., are convinced that there is no danger to their workings from the accumulated water in the abandoned Alliance colliery which adjoins their property, and which gave them some concern, due to the large body of water which has found its way into the idle mine.

The Black Ridge colliery of the Hazle Mountain Coal Co. has been abandoned and the company is selling the complete equipment. The officials of this firm, which is a branch of McTurk & Co., will go with the latter company to a new operation near Girardville.

Chauncy—Lightning hit the headhouse of the Gaylord colliery during a recent storm, and but for the prompt action of several of the employees doing night work it might have been destroyed or badly damaged. Employees are accustomed to take part in fire drills and the knowledge thus gained came in handy. The company maintains fire hydrants and several hundred feet of hose on the premises, hence it was but a few minutes before several strong streams of water were playing on the headhouse. Carpenters were put to work forthwith to repair the damage and the colliery worked as usual the next day.

Shenandoah—A recent button strike which threw 1000 men and boys out of work for four days at the William Penn colliery of the Susquehanna Coal Co. has been amicably adjusted by the miners' union and the men have returned to work.

Hazleton—The mining companies are rapidly disposing of their real estate holdings, other than actual coal land. Some time since A. Pardee & Co. sold all of the company houses which for years it had rented to the miners. This firm was soon followed by the Lehigh Valley Co. taking the same action, disposing of 24 houses to a manufacturing corporation.

Pottsville—Madeira, Hill & Co., of Philadelphia, is rapidly extending its coal operations in the Schuylkill district. Next week it will place in operation the new Black Creek colliery, which will have an output of 1000 tons daily and give employment to 500 people.

The present summer has been an exceptionally wet one in the anthracite region and instead of the mining companies being compelled to haul water long distances for boiler supply, as in previous years, they have been put to additional trouble and expense to keep the mines clear of the excess water. The past week the rainfall was particularly excessive and many of the collieries are in danger of being flooded out.

Pittston—Improvements are being made in the old air and pumping shaft of the Pennsylvania Coal Co. at the foot of Broad St. These improvements were started some time ago. The shaft, originally a small one, has been enlarged to 10x20 ft. and sunk to the lowest vein, after which concrete walls were constructed from the rock to the surface. A cap has been placed on the concrete walls bringing them up to a point somewhat above the level of the ground in preparation for the erection of a new steel tower in place of the old wooden structure that stood over the shaft for many years.

After working little more than half time for the last two months, collieries of the Lehigh Valley, Pennsylvania and Hillside Coal & Iron companies went on a full schedule this week and will continue to work steadily for an indefinite period.

Lansford—The report is current that the Lehigh Coal & Navigation Co. intends shortly to start washing coal from the immense culm banks in this vicinity and at Coaldale and Nesquehoning. This will mean work for quite a number of men who have been idle for some time.

Bituminous

Indiana—During a cloudburst the waters of a small stream rose so rapidly that they flowed into the mouth of the Sample Run mine, endangering the lives of the 450 miners working therein. The regular exit being cut off the men floundered about in water up to their necks for almost a mile, when they reached an air-shaft and climbed to safety. The mine will be idle for two weeks until the water can be pumped out.

Irvonia—Inability to secure prompt shipment of lumber for work on rebuilding the tipple at the Evans plant of the Evans Coal & Coke Co. has delayed work on construction so that it will probably be a month before the improvements that have been going on at that place for the past six weeks will be completed. Of the improvements planned, the air shaft and the gasoline haulage system have been completed. The total work will entail an expenditure of approximately $10,000.

Lynn Station—Orders have been issued by the American Connellsville Coal & Coke Co. for the firing of the entire plant at American No. 2, located at Lynn Station. This is the old Francis No. 1 plant of the Sunshine Coal & Coke Co. and consists of 240 ovens. For some time past repairs have been made in order to have the plant ready to fire.

Pittsburgh—The towboat "Exporter" recently left Pittsburgh with 6 barges of coal containing about 90,000 bushels, and one barge of manufactured steel for the Louisville market. The stage of the river was rather low.

Connellsville—During the recent past, a number of furnaces have required repairs. This has curtailed the fuel shipments from the Connellsville region and thrown considerable coke back upon the producers. It is considered that this condition is, however, only temporary. About ¾ of the available ovens in the district are in blast and indications are good for a further increase in the production.

WEST VIRGINIA

Fairmont—The Annabelle plant of the Four States Coal Co. has been closed, but it is believed will resume operation shortly. This plant employs about 800 men, and a temporary shutdown for repairs and to allow of certain changes in the arrangement of the mine and the policy of the operating company was necessary. It is believed, however, that this plant will be operating at full capacity again in a short time.

MARYLAND

Cumberland—The largest wheatfield in the State of Maryland is said to be owned by the Consolidation Coal Co. This field contains 128 acres and lies adjacent to the old national pike between Cumberland and Frostburg. It was cultivated under the supervision of Louis Rase, farm superintendent of the company, and the yield of grain is said to be extraordinarily heavy. The development of this farm by a coal mining company is being carefully watched by farmers throughout the state.

ALABAMA

Birmingham—The coal operators of the Birmingham district are interested in the bill before the legislature giving the state jurisdiction over the Mobile docks. This will affect shipping of coal from Birmingham but whether favorably or unfavorably is not yet determined by the coal men.

Governor Henderson has assembled a mass of information on the subject of taking the convicts out of the coal mines and lumber camps, and has sent a special message to the legislature. He is opposed to the bill now before the legislature which provides for the removal of convicts from the mines. The bill is being vigorously seconded by the miners.

Jasper—The Sunlight Coal Co. is now operating mines near Jasper by the stripping process. The coal is of excellent grade and lies from 5 to 15 ft. below the surface of the ground. Shipping will be begun in about two months. The stripping of coal deposits is a new method of coal mining in Alabama.

KENTUCKY

Middlesboro—News reaching here is to the effect that 300 employees of the Catron's Creek Coal Co. have gone out on strike, demanding recognition of the recently formed union and reinstatement of two men who, it is alleged, were discharged as a result of their activity in unionizing the camp.

OHIO

Columbus—The Piney Fork Coal Co. of Columbus, which is developing a stripping operation in Jefferson County, Ohio, 12 miles west of Steubenville, has been delayed to a large extent by the excessive rainfall during the past two months. The work of laying the permanent tracks and switches is progressing as fast as possible under the circumstances. According to General Manager J. W. Blower the operation will not be ready before Sept. 10. The huge steam shovel is completed and on the cars for shipment to the operation.

Monsarrat Bros., of Columbus and Corning, are arranging to market their product direct instead of through jobbers as has been the case in the past. The company has an office in the Hartman Building in Columbus.

Cambridge—The trouble at the Little Kate mine of the National Coal Co., located in the Cambridge district has been settled and work was resumed Aug. 9. The trouble arose over lack of safety arrangements. The company has agreed to build an interior opening and the Ohio Mining Department extended the time for completing the opening for 30 days. About 150 men are employed at the mine.

Brilliant—When the property of the Dexter Coal Co. of Brilliant, Ohio, was offered for sale in a bankruptcy proceeding by Receiver J. C. Ault, there were no bidders and the property will be readvertised.

New Lexington—The announcement is made that a number of Hocking Valley mines have been closed down indefinitely because of lack of demand for Ohio coal. The operations closed recently were Mine No. 266 at Hollister, Ohio; Mine No. 254 at Jacksonville, Ohio, and Mine No. 268 at Rendville. About 800 men were thrown out of employment.

ILLINOIS

Carlinville—A hearing is in progress in the Macoupin County Circuit Court in the injunction suit brought by the Superior Coal Co. against Louis H. Miller and others to restrain them from drilling oil wells through the coal rights of the Superior company. The question at issue is whether the coal company's rights apply to all minerals, including the oil-bearing sand. A temporary restraining order has been issued. The coal company contends that drilling through the coal veins will damage the property and cause great loss. The fear is that gas pockets would form and there would be explosions. The coal company asks that if the boring for oil is permitted to continue, it be compensated with $\frac{1}{16}$ of the oil findings. A large number of witnesses have been called and the hearing is expected to continue several days.

Percy—The Willis Coal & Mining Co. has discontinued operations at three of its mines and is operating only one. The company finds that it can buy coal in the open market to better advantage, at the current prices, than it can mine it, and is filling its contracts in this manner.

Belleville—Stephen Krezo has been brought here from Marissa, Ill., to have his mental condition inquired into. He was entombed in the Royalton, Ill., mine Oct. 27, 1914, when 58 miners were killed by an explosion, and it was four days before he was rescued. His mind is said to have been affected by the experience.

COLORADO

Denver—All the large coal companies in this state with the exception of the Colorado Fuel & Iron Co., have organized a mutual insurance company to carry the indemnities imposed by the new workmens' compensation law which went into effect Aug. 1. The Colorado Fuel & Iron Co. has arranged with the state authorities to carry its own insurance. The mutual company will write insurance for its various members at the rate of $4.60 per hundred dollars of payroll. It is expected that, unless unusual disasters occur during the first year of the experiment, the company will find it possible to considerably reduce this premium. Since no profit is contemplated from the maintenance of this insurance company, it seems reasonable that it can conduct its business and meet all ordinary obligations at a much lower rate of premium than can the regular insurance concerns.

Trinidad—The annual first aid contest of the Victor-American Fuel Co. coal camps will take place at Walsenburg on Aug. 28.

The Colorado Fuel & Iron Co. is completing the erection at Sopris of a modern clubhouse for the miners and a domestic science department and gymnasium building for the school.

Delagua—Delagua and Hastings, the two largest properties of the Victor-American Fuel Co. in the Trinidad district, began working full time the week beginning Aug. 8. About 50 additional men will be employed. Old coke ovens which have not been burning since the strike was called in September, 1913, will be put in operation.

FOREIGN NEWS

Havre, France—Miners in the Mons District recently went on strike, according to reports received at Havre. Groups of these miners had friction with German soldiers and a serious riot followed, during which two Germans and several miners were killed. It is reported that intense unrest prevails throughout the Mons District.

Toronto, Ont.—The Dominion Coal Co., of Sydney, N. S., is negotiating with the Intercolonial Ry. for the transportation by rail of a large tonnage of coal to Quebec and Montreal. There is a marked scarcity of vessels for the St. Lawrence trade and as there is a considerable shortage of railway freight it is probable that a satisfactory arrangement will be effected.

London, England—The Foreign Office, through a statement, recently explained that the order prohibiting the exportation of coal to other than British possessions did not signify a total prohibition of the trade. Firms making shipments to such places hereafter will be required to obtain a special license. It is said that this order was necessary because of legislation regulating the price of coal in Great Britain.

Edmonton, Alta.—At the annual meeting of the Edmonton Standard Coal Co., Ltd., on July 30, it was decided to remove the headquarters of the company from Toronto to Edmonton. General manager, W. M. Munns stated that owing to a rise in the Saskatchewan River the old workings had been abandoned and that work had been commenced in sinking a new shaft on the north side of Rat Creek, near the railway, which would improve the company's transportation facilities. A bond issue of $50,000 will provide the funds required for machinery and equipment.

PERSONALS

William G. Polk, secretary of the Hazard Coal Co., with offices in the Paul Jones Building, Louisville, has been elected as the coal mining member of the Louisville Rotary Club.

W. J. Jenkins, president of the Western Coal & Mining Co., president of the Union Fuel Co., and vice-president of the Consolidated Coal Co., St. Louis, has gone on an extended vacation trip.

Robert D. Reeves, assistant general freight agent of the Illinois Central and Yazoo & Mississippi Valley railroads, has been named vice-president and general manager of the W. G. Coyle Coal Co. at New Orleans, following a plan to enlarge and develop the operations of the latter company in that port.

Edward Barlow, who was formerly with the Montgomery County Coal Co. and more recently was proprietor of the Herrin (Ill.) Journal, has disposed of his newspaper and taken a position with the Lumaghi Coal Co. at St. Louis. He is a son of Harry Barlow, superintendent of the Black Briar Mine at Johnston City.

John W. Gates of Welch, W. Va., has been appointed district mine inspector of the Fourteenth District of that State with headquarters at Williamson. Mr. Gates succeeds P. P. Kerr, who resigned recently to accept a position as mine superintendent for the Yukon-Pocahontas Coal Co., Yukon, W. Va. Mr. Gates is a practical mining man of wide experience, and well fitted for the position which he now holds.

R. Y. Williams, formerly director of the Illinois State Miners and Mechanics Institute, has been appointed safety engineer for the Delaware & Hudson Co. This is a new office in the anthracite coal region. Another new office is that of efficiency engineer for the same company, to which A. E. Lister has been appointed. C. A. Straw has been appointed mechanical engineer and M. A. Walker, assistant mechanical engineer for the same company. These four offices have been created instead of filling the position of the late C. C. Rose, general superintendent.

OBITUARY

Alexander Dempster, aged 79 years, his wife and his chauffeur, were instantly killed in an automobile accident on Aug. 2, while his son, James G. Dempster, aged 32 years, was severely injured. The family were returning from Baltimore, Md. They were motoring through the mountains and the chauffeur was hurrying to reach Ligonier before a rapidly approaching storm. The car had just passed the Mountain Inn at Ligonier, when it careened to one side, struck a huge oak tree and plunged over the embankment carrying the occupants with it. Mr. Dempster was born in Scotland and came to Pittsburgh in his youth. He served in the Union army during the Civil War. Returning to Pittsburgh he became a civil engineer. Later he became interested in the western Pennsylvania coal industry, acquiring several mines which he operated independently with great success. Some years ago he disposed of his holdings to the Pittsburgh Coal Co. and became a director of that corporation. At another time he was a director and president of the Monongahela River Consolidated Coal & Coke Co. His interests were numerous and scattered of recent years as he became an investor in lead and zinc mines in Missouri and in timber tracts and stone quarries. He was one of the oldest members of the Duquesne Club. Mr. Dempster is survived by four sons, James, Arthur, Samuel and D. M. Dempster, and one daughter, Mrs. E. Bruce Hill.

RECENT COAL AND COKE PATENTS

Grate. C. B. Roberts, Belfast, Maine., 1,138,976, May 11, 1915. Filed Apr. 6, 1914. Serial No. 829,916.

Miner's Drill. S. T. Skeen, Sandoval, Ill. 1,140,077, May 18, 1915. Filed Apr. 24, 1914. Serial No. 834,035.

Furnace Grate. H. Benton, Elizabeth, N. J., 1,139,097, May 11, 1915. Filed Apr. 18, 1912. Serial No. 691,693.

Automatic Stoker. A. C. Nelson, Duluth, Minn., 1,138,501, May 4, 1915. Filed Dec. 30, 1913. Serial No. 809,555.

Smoke Consumer. H. Kleman, Pittsburgh, Penn., 1,139,194, May 11, 1915. Filed Aug. 29, 1910. Serial No. 579,519.

Coke Producing Plant. F. Tschudy, Birmingham Ala., 1,139,088, May 11, 1915. Filed June 17, 1911. Serial No. 633,848.

Coal Breaker and Scraper. J. P. Considine, Detroit, Mich., 1,138,627, May 11, 1915. Filed Nov. 21, 1913. Serial No. 802,204.

Locomotive Boiler Furnace. F. F. Gaines, assigner to American Arch Co., New York, N. Y., 1,138,060, May 4, 1915. Filed July 24, 1913. Serial No. 780,968.

Apparatus for Cleaning Smoke Tubes of Boilers. C. H. Shepler and J. W. Shearer, San Francisco, Calif., 1,139,911, May 18, 1915. Filed Mar. 24, 1914. Serial No. 826,952.

Fuel Feeding Apparatus. R. Niedergesaess, assignor to American Smokeless Burner Co., a corporation of Washington, 1,139,708, May 18, 1915. Filed Jan. 15, 1914. Serial No. 812,254.

INDUSTRIAL NEWS

Birmingham, Ala.—Six barges have been chartered by the Tennessee Coal & Iron Co. from the Alabama & New Orleans Transportation Co. for the transportation of coal down the Warrior River.

Harrisburg, Penn.—The Bureau of Anthracite Statistics reports that approximately 1,350,485 tons less of anthracite were shipped to market in the first six months of this year than during the same time in 1914.

Philadelphia, Penn.—The Pennsylvania R.R. for the month of July has reported an increase in the loaded car movement, in which shipments of bituminous coal eastward have contributed to the extent of 1.9 per cent.

Maxine, Ala.—The Pratt Consolidated Coal Co. has been receiving orders so rapidly that it has put on a night shift as well as a day shift on the steamer "M. Carney," which is used in towing coal barges from Maxine to Mobile.

Philadelphia, Penn.—The export of coal to foreign markets shows a considerable increase from this port during the past month. Exports of anthracite and bituminous amounted to 171,027 tons as compared with 59,855 tons shipped during the same period of last year.

Mobile, Ala.—The Mobile Coal Co. recently awarded a contract to the Slidell Dry Docks & Ship Building Co. of Slidell, La., for the construction of six barges, to be used in the Warrior River coal trade. The new fleet will be towed by the steamer "Martha Hennen," plying between the coal mines and Mobile.

Washington, D. C.—The Interstate Commerce Commission has announced a further suspension, from Aug. 30 until Feb. 29, of the Chesapeake & Ohio tariff which provides for an increase in rates on bituminous coal, carloads, from West Virginia to certain points in Kentucky. The previous suspension was from May 2 until Aug. 30.

Denver, Colo.—Denver & Salt Lake R.R. (formerly the Moffatt road) has been denied a petition for a rehearing in recent rulings of the state public utilities commission whereby freight rates on coal from the northwestern Colorado coal field to the eastern state line were materially reduced. This affects shipments to Kansas and Nebraska points.

Scranton, Penn.—It is stated that the large armory of the National Guard in this city is in danger of sinking into a mine which underlies the land on which the structure has been built. In order to overcome the difficulty the state authorities have decided to partly fill the old working and support the roof with massive concrete abutments.

Huntington, W. Va.—The Chesapeake & Ohio Ry. broke its coal-loading record in July by almost 8000 tons. The total loading for the month on the system was 2,224,020 tons. The best record of any previous month was established in August, 1914, by the loading of 2,216,460 tons. It is thought that this record for one month may be again broken in August.

Pittston, Penn.—Dredging coal deposits from the bed of the Susquehanna River has never been successfully undertaken north of Wilkes-Barre, but the Citizens Electric Illuminating Co. has purchased an equipment and plans to remove coal from the river bed just south of the Lackawanna River outlet. A centrifugal pump driven by a vertical engine will be employed.

Philadelphia, Penn.—Since the British Government has issued its Orders in Council prohibiting any exports of coal after Aug. 30, except to the colonies, the shippers of bituminous coal from this port expect to share largely in the increased demand from abroad, especially from those countries who as allies have been able to secure shipments from Great Britain.

Meadville, Penn.—It has been announced that the Phoenix Iron Wks. will be materially enlarged. Permission has been granted for the company to increase its capital from $200,000 to $300,000 for the purpose of enlarging the plant and increasing its output. It is proposed to develop to full capacity the plate or tank shop, the foundry and the boiler shop. It is estimated that the monthly payroll will be increased by at least $5000.

Pittsburgh, Penn.—James S. Boggs and Charles W. Theis were recently appointed receivers of the Meadowlands Coal Co. by Judge A. B. Reid. The appointment of Mr. Theis was made after a conference between counsel for the bankrupt company and the creditors. The former receiver was appointed permanently, having served for several weeks as temporary receiver. The Court fixed the bonds of the receivers at $10,000 each.

Spokane, Wash.—Reports reaching here from Glacier, Washington, state that a coal strike has been made by Albert Vaughan who has organized the Bituminous Coal Association. The vein is said to be 27 ft. wide at the outcropping. The Washington Anthracite Coal Co. is reported to have made the discovery of good coal on its property near Glacier. The vein is said to be 14 ft. at the lower level, 1400 ft. below the surface. There is 2000 ft. of tunnel at this level.

Baltimore, Md.—Railroads entering this city are rushing equipment orders and rolling stock that is not needed for immediate use is being repaired and put in good shape. The Pennsylvania R.R. will within a few days begin the construction work on a new coal pier, and the Baltimore & Ohio has about completed plans for a large new pier to supplement the present one at Curtis Bay. The pier now in use has an extreme loading capacity of 1000 tons per hour on each side.

Fairmont, W. Va.—Contract for the construction of the Helens Run Ry. from the Baltimore & Ohio at Worthington to the Helens Run coalfield, a distance of about 6 miles, has been let to A. L. Anderson & Bros., Inc., of Altoona, Penn. Men have already been put to work along the recently surveyed line for the purpose of preparing for grading and bridge building, which will start shortly. Several hundred men will be employed in the construction work which will be pushed as fast as possible.

Philadelphia, Penn.—Foreign shipments of coal from here during July showed an increase of more than 50,000 tons over the same month of last year, according to the monthly report of the statistician of the Commissioner of Navigation. His report showed that during the last month 171,127 tons of anthracite and bituminous coal were exported, as compared with 59,855 tons during July, 1914. Shipments of coal to coastwise ports during the month amounted to 259,788 tons, as against 266,270 tons in the corresponding month of last year.

Philadelphia, Penn.—The Philadelphia & Reading Coal & Iron Co. has libeled the steamship "Concord" of the Colonial Line for $70,000 damages. This sum the company claims represents the loss of the barge "Exeter" and the 2900 tons of anthracite with which the boat was loaded when struck and sunk by the steamer on July 31. The papers were served against the Concord while at her pier in Providence, R. I., and the owners were compelled to file a bond of $100,000 to procure the release of the boat in order to fulfill the regular sailing schedule to New York.

Denver, Colo.—A settlement has been effected by the Government with the American Smelting & Refining Co. in a case which has long been pending in the United States Court. The cash sum of $112,766 was paid to District Attorney Tedrow and forwarded to the Federal Government, being payment for coal actually taken from the mines at Aguilar and Cokedale, which are said to have been obtained from the Government through fraud. A total of 3475 acres of valuable coal land has also been returned from the company to the United States Government on the ground of having been obtained fraudulently.

Connellsville, Penn.—The Consolidated Connellsville Coke Co. recently shipped 5550 tons of furnace coke consigned to New York docks where it will be loaded for shipment to South America. Negotiations for the shipment of 40,000 tons of Connellsville coke are pending, and will probably be closed during the current month. The contract already shipped is the second consignment which the Consolidated Co. has handled in the past two months, the first cargo being 4500 tons sent in the early part of June. While the first cargo went to the Argentine, the present shipment is understood to be consigned to Chile.

Portland, Me.—President W. L. Connell, of the Lackawanna Coal & Lumber Co., recently asked a group of bondholders to forego the interest for two years on their bonds, to extend the notes given for interest due last October, and also to contribute a six per cent. assessment on their stock. This meeting is one of a series that is being held all over the country where groups of bondholders are located, to counteract the projects of an element which does not hold with the plans of the present management. The outcome of such agitation President Connell pointed out might be a receivership and forced sale under the hammer. He contends that the property is the most valuable of its kind in the world.

Bismarck, N. D.—The state railroad commission recently heard arguments on the lignite coal rate case in this state. The various railroads interested in coal rates, as well as mine operators were in attendance. Attorneys for the Soo railroads presented evidence to show that the present rate which the operators claim is excessive is only reasonable. They presented a complete statement of all their business for 1914. Attorneys for the Northern Pacific also held the present rate to be reasonable and gave a brief outline of the effect of the recent supreme court decision on the railroad business. The railroads will submit further data to the commission before a decision on the lignite rate is returned. A comparison will be made with rates in other states, which will be submitted by the attorneys for the various roads.

Connellsville, Penn.—The H. C. Frick Coke Co. is instructing its firemen and boiler house attendants in the principles of economy and efficiency. The study classes of this company, which have been conducted for the past three years will hold a series of meetings throughout the plants of the Connellsville region to continue education along these lines. According to the plan which will probably be adopted, the boiler house men from four or five plants will meet at some central point, there to discuss boiler house problems and receive instruction in the economic use of fuel. Experienced fuel experts will meet with the men, giving short talks on the subject of fuel economy as well as conducting investigations into the question of better boiler house practice. I. C. Kelly, master mechanic of the company, and R. C. Lyon of Connellsville, will have charge of this work.

Philadelphia, Penn.—An interesting and well vouched for story is going the rounds of the bituminous trade here. It was all due to the efforts made on the part of some shippers to secure the coal trade of Italy since England has shut off all exports. One of the large Philadelphia shippers was particularly anxious to secure the contract for supplying one of the government railways in Italy and for that purpose paid a visit to Rome. On the very day he arrived he was caught in an immense throng surging toward the street and when he got to a position of vantage found it was the King's automobile that had caused the commotion. And alongside of Victor Emmanuel sat E. J. Berwind, of the Berwind-White Coal Mining Co., of Philadelphia. Mr. Berwind probably was not talking shop to the King at the time, yet the other Philadelphian concluded that anybody who expected to beat Mr. Berwind would have to be extra swift, so he came home at once.

Philadelphia, Penn.—An interesting fact disclosed in the annual statement of President Thomas was that the Lehigh Valley Coal Co. mined 258,205 tons of bituminous coal last year, being a slight increase over the previous year. This coal, of course, was not mined on the line of the Lehigh Valley R.R., as none of the socalled anthracite roads has direct access to bituminous mines. While the above is not a large tonnage, it is of interest when it is considered that with this exception no other large anthracite company has ever engaged in the mining of bituminous coal. About 15 years ago the late George F. Baer purchased a large bituminous property in Somerset County, which it was reported was to be reached by a line from Shippensburg. For some reason the projected line was never started and some years later the Reading company disposed of the holdings without ever having made an effort at development.

Coal Trade Reviews

General Review

Approach of fall season the only constructive feature in the anthracite situation. Slightly firmer tone in bituminous, though it is still a buyer's market. Exports continue to boom. Delayed buying at interior points expected to cause a congestion.

The approach of the fall season is the one constructive feature in the anthracite situation. It is evident that many long-deferred orders must be released shortly, but until this occurs no activity can be expected. At the moment only a rigid curtailment, particularly among the individual operators, has saved a general demoralization. The large demurrage bills, against even some of the big companies, is tangible evidence of how unusually dull the anthracite market has been. The better grade steam sizes are moving more freely and, while concessions by the individuals are still the rule, there is apparently not so much of this coal being placed. Some inquiries for anthracite exports are developing. The Lake shipments show a further increase, and the docks are more active than for a long time. At interior points like Ohio hard coal is being absorbed better than in previous years.

Eastern bituminous buyers are still proceeding cautiously, and the trade continues marking time, though consumers are possibly showing less disposition to hold out for bottom prices. However, it is distinctly a buyers' market. Occasional tonnages are still going at sacrifice prices, in order to avoid demurrage, and as liberal inducements can be obtained as at any time this season. Consumption and demand at line points are apparently better than at Tidewater.

The new British regulations, restricting exports still further, have stimulated renewed interest in the foreign business. In spite of the general tendency to belittle this business, it is clear that it is proving a potent factor in relieving the pressure in certain quarters. There has been another spurt in the demand for high-grade coal for export, and the volume now moving in this direction is sufficient to hold prices fairly even. Evidence of the heavy shipping is noted in the situation at Hampton Roads, where some companies continue having difficulty in getting coal forward fast enough to meet their obligations. The increased demand for grain steamers has stiffened rates in the off-shore trade, while coastwise vessels continue sensitive to the fluctuating demand for coal, some unusually high figures being noted.

There is a slightly heavier demand in the Pittsburgh district, but there is plenty of free coal still available, and quotations have not as yet been affected. While it cannot be said that there has been a positive turn for the better, the heavy operations at the steel mills are undoubtedly creating a better sentiment, and the operators are taking a somewhat different view as regards contract prices. Slack coal is notably stronger.

The improvement in the Ohio situation continues, although it is not very extensive, and buying continues conservative. The increase appears to be general in all directions; domestic demand is larger, while requisitions from manufacturing plants are increasing and the railroads are taking a greater tonnage in order to handle the heavier traffic. The unusually large crops have had a notably stimulating effect on the business outlook. The extremely light Lake movement continues the one acutely depressing factor in the situation. The unusually low prices recently in effect have apparently been wiped out.

Buying in the Middle West has been so generally delayed in all directions that there is danger of a serious congestion when the crops and coal start moving together, as must be the case very shortly; it is well established that stocks are small throughout the country districts, and when the buying opens up there will be a rush for coal. The heavy rainfalls over the early part of the month had a tendency to delay harvesting and seriously interrupted deliveries in the country districts. The rapid improvement in the iron and steel industries has been one of the most impelling constructive factors in the current situation.

A Year Ago—Business uncertainty has created a sharp buying movement in anthracite. Derangement in coastwise and foreign shipping has seriously disturbed the Eastern bituminous situation. Producers aggressively investigating the possibilities in the foreign markets. Sentiment generally better.

BUSINESS OPINIONS

Boston News Bureau—At the moment much of the good news has come out. The latest, the decision of the Interstate Commerce Commission in the Western railroad case, gives many increases, but not in every instance. The further heavy influx of gold from England is a feature. It is an encouraging sign to see England shipping gold here rather than establishing a credit. If she continues this policy she will gain prestige the world over. The situation is still one that puzzles the brightest. Conservative men are extremely conservative. They are not inclined to make large commitments and yet they are not loud in protest.

Iron Age—Active buying at advancing prices has centered attention on the pig-iron market. Steel-making pig iron has led in tonnage and has advanced $1 a ton in nearly all markets except Chicago. Thus the heavy demand for openhearth steel which caused so abrupt a rise in billets is now also the dominant factor in pig iron. Some excitement has been added to the situation by a reported purchase of pig iron at Cleveland by the Steel Corporation, but confirmation of this report is lacking.

American Wool and Cotton Reporter—It was a comparatively big week in the Boston wool market, with sales of 6,310,000 lb. More medium wools were sold than for the previous week. Prices are a shade firmer. That the market is in for a period of high value is the feeling practically throughout the trade. Trading seems to be pretty general on both domestic and foreign wool. There has been some speculation in noils in anticipation of army contracts.

The Government Crop Report—The Government crop report as of Aug. 1 is highly encouraging. The estimated production of corn, wheat and oats is placed at 5,286,000,000 bu., which compares with previous years as follows: 4,704,000,000 bu. in 1914; 4,331,000,000 bu. in 1913; 5,272,000,000 bu. in 1912 and 4,074,000,000 bu. in 1911. The production for the current year is 15% ahead of the average for the four preceding years and is worth approximately a half a billion dollars more than the average for the past three years. With the Dardanelles closed against Russian export the demand for our grain will also be of such proportion as to assure a very satisfactory price.

Duns—Commercial progress would be more uniform were it not for the vagaries of the weather, especially in the East. Confidence, however, is not shaken by influences of a temporary nature, and apart from these handicaps, developments continue mainly on the constructive side. Rarely have fundamental conditions been as sound as at present, and knowledge of this fact leads to the conviction that nothing is likely to permanently check the revival of general business activity. More shoe factories are running close to capacity and there is a noticeable revival in the wool industry.

The Southern Lumberman—Reports from the several yellow pine manufacturing territories and from the consuming markets are more uniform and more optimistic this week than at any time within the past two months. Stocks at the mills and on yards of both wholesalers and retail dealers are to some extent broken. The volume of hardwood business for July, while not what might have been desired, was nevertheless fairly satisfactory.

Marshall Field & Co.—The month of August has started with a substantial gain in shipments as compared with those of a year ago. The "market week" and "style show" brought a large attendance of buyers from all sections of the country. Weather conditions have been decidedly unfavorable to retail selling. Collections are good.

Bradstreets—Basic conditions continue to improve and feeling as to the future is more optimistic, but withal, conservatism, born of uncertainty as to results likely to follow a wet harvest, with some toning down of earlier exuberant crop estimates, is quite marked in grain-raising sections. So, on the one hand, country buyers are inclined to be cautious, while on the other, those hailing from metal manufacturing centers are more set upon going ahead.

ATLANTIC SEABOARD

BOSTON

Market very dull and receipts are being applied almost exclusively to contracts. Buyers recognize this as a favorable time to secure concessions. Georges Creek and Pennsylvania grades unchanged. Water freights variable. Anthracite business fair.

Bituminous—The Pocahontas and New River market is almost featureless. While the volume of coal moving off-shore is still large and is sufficient to hold prices fairly even there is almost no demand coastwise. There are perhaps fewer concessions heard than a fortnight ago, but that is due not so much to any firmer tendency as to the fact that shippers realize that even low prices will not stir up new business of any account. Receipts have been extremely light on account of the continued thick weather but now that cargoes are arriving it is seen that practically all are being applied to contracts.

Only a few orders are hanging fire and what buyers are in the market are proceeding very cautiously. Right now is probably as favorable a time as any this season for buyers to secure liberal inducements from most of the agencies. A few of the shippers with long established connections abroad did practically a normal business in July.

The abundant supply of water is a factor in the August dullness that prevails in New England. Many industrial plants will go light on coal for several weeks to come.

There is little news on Georges Creek. Loading for export has taken a spurt at Baltimore but otherwise the situation with the shippers is about normal for the season. There is no longer any difficulty about effecting prompt shipment.

The houses which handle the Pennsylvania grades are watching this market very closely with a view now to next year. There is an increasing disposition on the part of buyers to look into the merits of high-grade coals from the Pennsylvania districts and unless the present differential with Southern coals is reduced there is likely to be an expanding business in this direction another year.

Water Freights from Hampton Roads to Boston are quite sensitive to the fluctuating demand for coal. Sailing vessels are scarcely heard from except in the case of small coasters loading at New York, and barges and steamers are carrying practically all the coal; 75c. to Boston is quoted as the market on bottoms 2500 tons upwards; $1.25@1.50 has been paid on 500-ton vessels, New York to Calais and Eastport, Me., an unusually high rate.

Anthracite—The larger companies have a better supply of orders than was anticipated. Shipments are made promptly but there is enough business so that anthracite-carrying barges are not so easy to secure for bituminous loading. Individual shippers are still offering material concessions but very little of such coal has been placed here. Retailers are making exertions to get customers to accept deliveries now in order to relieve the congestion that is usual in the early fall.

Quotations on bituminous at wholesale are about as follows:

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines*	$0.85@1.40	$1.15@1.60	$1.67@1.77	
Philadelphia*	2.10@2.65	2.40@2.85	2.92@3.02	
New York*	2.40@2.95	2.70@3.15	3.22@3.32	
Baltimore*	....	....	2.85@2.95	
Hampton Roads*	....	....	....	$2.65@2.80
Boston†	....	....	....	3.50@3.63
Providence†	....	....	....	3.45@3.68

* F.o.b. †On cars.

NEW YORK

Some cheap bargains in bituminous. Export business continues large but bunkering is slowing up. Anthracite season advancing. Prices still rule substantially below the circular.

Bituminous—Opportunities favorable to the consumer continue to offer themselves through the agency of demurrage coal. Some cargoes have been sacrificed in order to escape further losses by car demurrage. There are generally times throughout the year in the bituminous market when this is true so that the condition is not a new one. The bunkering tonnage has naturally fallen off here and with mining continuing, even if on short time, some place must be found for the coal.

Fortunately the export orders have come to the rescue and while a great deal is said about the bluff of this business it is nevertheless a fact that quantities of coal have been shipped to the belligerent nations and South American countries. It may be said that better prices are being obtained on this class of business than on the regular local contract supplies. The open market quotations prove too strong a temptation for the average consumer to overlook. Line bituminous out of New York is holding up well. The holders of contracts there seem to be scrupulous and their draughts on their allottments are normal.

Current quotations are on the following basis:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.30@3.40	$3.30@3.40	$3.30@3.40	$1.75@1.85
Georges Creek Tyson	2.90@3.00	2.90@3.00	2.90@3.00	1.35@1.45
Clearfield:				
Medium	2.65@2.80	2.55@2.65	....	1.10@1.25
Ordinary	2.55@2.60	2.55@2.60	....	1.00@1.10
Broad Top Mountain				1.10@1.45
Cambria County:				
South Forks	2.90@3.05	....	....	1.35@1.50
Nanty Glo	2.75@2.80	....	....	1.20@1.25
Barnesboro	2.65@2.70	....	....	1.10@1.15
Somerset County:				
Quemahoning	....	2.70@2.85	2.70@2.85	1.20@1.30
Medium	2.65@2.70	2.60@2.65	2.60@2.65	1.10@1.15
Latrobe	2.45@2.55	....	....	.90@1.00
Greensburg	2.75@2.80	....	....	1.10@1.15
Westmoreland	3.15@3.20	....	....	1.35@1.45
West Virginia Fairmont ¾		2.60@2.70	2.60@2.70	.80@ .90
Fairmont mine-run		2.50@2.60	2.50@2.60	.70@ .80
Steam		2.45@2.50	2.45@2.50	.90@ .95
Western Maryland		2.35@2.40	2.35@2.40	.80@ .85

Anthracite—There remain but a few weeks more before there will be an evident stimulation in the market. With August half over this much needed change cannot be further away than the week following Labor Day. There are orders on the books of the retailers, some of which date back to April, which will surely have to be filled in September. When these orders are received the retailers will begin to buy but not until then.

Mining operations have been limited to two or three days each week at most of the collieries. This is also true of some of the individuals. Lake shipments require the bulk of the prepared sizes now being produced and it is noted that each week's lake report shows a very satisfactory tonnage. Conversely the New York market absorbs the steam sizes, especially rice and barley. The better grades of these coals are in strong demand and prompt loading is out of the question. This situation will clear a little when full mining is resumed but the prospects are that there will be no over-abundance during the entire winter.

Pea coal is a drug at the present and is going into stock. There is no large accumulation of domestic sizes at the loading ports and there is little local demand, yet prices have held well. In some cases chestnut has sold lower than either stove or egg. Of the three stove may be said to be the leader.

Export inquiries calling for broken and steamboat coal receive little attention. The broken output is being absorbed on gas-house and manufacturing contracts and steamboat is unprofitable to produce.

Following are the average quotations af the week:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$4.95		$5.00	
Egg	5.20	$4.70@5.20	5.25	$4.75@5.25
Stove	5.20	4.90@5.20	5.25	4.75@5.25
Chestnut	5.45	4.85@5.45	5.50	5.05@5.50
Pea	3.50	2.70@2.95	3.50	2.75@3.00
Buckwheat	2.75	2.00@2.25	2.80	2.05@2.30
Rice	2.25	1.70@1.85	2.30	1.75@1.90
Barley	1.75	1.45@1.70	1.80	1.50@1.75

PHILADELPHIA

Anthracite continues dull, although some sizes are stronger. Cheap coals not so active, and pea shows slight tendency to tighten. Collections extremely poor. Bituminous quiet, but slack somewhat scarce. Exports continue to increase.

Anthracite—While the shutting down of the collieries, especially those of the individuals, is all that has kept the trade from being thoroughly demoralized for the past three or four weeks, this cessation of mining is being felt and there is probably less very cheap coal in the market than for some time, excepting chestnut, sales of even the smallest quantity of this still being reported at the April price. We know of one recent sale of 1200 tons of stove and 1800 tons of chestnut at April rates, the latter size making the order attractive; shipments on this order are to be made at the seller's convenience.

Broken and the steam sizes are being absorbed, while egg and stove are still causing little trouble, especially as it is reported that shipments to the New England market are improving. The pea coal situation is progressing rather favorably, although the individuals show little disposition to allow the large companies to secure the business at their price of $2 and tax. The former's price has advanced 10 or 15c. per ton in many instances, but is the same amount off what is now practically accepted as circular—the $2 rate. One of the reasons for the slightly improved business is the amount of coal being bought by various institutions in and around Philadelphia. This seems to be the season for laying in their supply.

The demurrage bills are coming in from the railroads for cars that were held at the scales pending disposition, and the shippers realize more than ever just what a dull siege they have been going through. While the smaller operators have been great sufferers in this respect, it is known that at least one of the largest companies has been penalized thousands of dollars. There are no "free lists" these days.

It is understood that considerable coal is being stored at Port Richmond piers for reconsignment when business braces up. This costs the shippers 5c. per ton to dump, 10c. per ton to pick up and 1c. per ton per month for storage.

Collections remain poor and probably will continue so until fall. A careful canvass of the trade shows that few can boast of any improvement. The circular prices, to which the state tax of 2½c. per ton should be added, are as follows:

	Line	Tide		Line	Tide
Broken	$3.40	$4.65	Pea	$2.50	$3.25
Egg	3.65	4.90	Buckwheat	1.25	2.25
Stove	3.90	4.90	Rice	.85	1.75
Chestnut	4.05	5.15	Barley	.50	1.50

Bituminous—The only noticeable feature of the market the past week was the tightening of slack coals. This was probably due to lack of demand for the three-quarter sizes and as a consequence had a tendency to raise the price of slack from five to ten cents a ton. Outside of this slight stir the market still seems to be marking time, although some quarters report a continuation of the increase in tonnage noted last week.

The trade is now looking toward fall when a real boost is expected. In the meanwhile the export business continues in increasing volume, especially so since the British Government has issued its Orders in Council prohibiting any exports at all effective Sept. 1, and the inquiries are now coming in, in greater numbers than usual. In this work the Government itself is assisting to some extent through our consular agents abroad, whose reports are printed and forwarded to the various mining interests. There is hardly an American consul who does not weekly report of opportunities to secure coal business.

The Commissioners of Navigation in their monthly report announce the shipment of 171,127 tons of bituminous coal to foreign shores as compared with 59,855 tons last year. Shipments to coastwise points amounted to 259,788 tons as against 266,270 tons in July of last year.

The current prices are as follows:

Georges Creek Big Vein	$1.65@1.75	Fairmont gas, mine-run	$1.15@1.25
South Fork Miller Vein	1.50@1.60	Fairmont gas, slack	.70@ .80
Clearfield (ordinary)	1.00@1.20	Fairmont lump, ordinary	.85@ .95
Somerset (ordinary)	1.00@1.15	Fairmont mine-run	.75@ .80
West Va. Freeport	.85@ .95	Fairmont slack	50@ .60

BALTIMORE

A slow improvement noted here. Export movement holds good. Anthracite dealers pushing in delayed deliveries.

There can no longer be a doubt but that business conditions are improving. There is a better line of inquiry, less haggling for bottom prices, and an increasing demand on contracts. There is still much to be desired but there is a decidedly better tone.

The remarkable export movement holds up in good shape. During July a total of 251,485 tons was loaded as cargo coal for foreign ports. For the first six workings days of August a total of 54,856 tons was put in foreign bottoms as cargo fuel, in addition to 7010 for bunker use. Prospects are that August or September will exceed July movement, the banner month, when 309,000 tons was sent out on export.

Anthracite men are showing more life and some fair orders are coming in mainly for early fall delivery. In the meantime that part of the trade is pushing in delayed deliveries wherever the opportunity offers so as to be free for the fall rush.

HAMPTON ROADS

Export shipments to Italy continue heavy. Coastwise movement fair. No change in prices. Dumpings for month of July reach the enormous figure of 1,562,330 tons, breaking all former records.

The movement from Tidewater piers during the week has not been as heavy as expected but there have been a number of large cargoes loaded for both coastwise and foreign ports. There is practically no change in prices although the demand continues heavy for export coal. The accumulation on the railroad yards is still somewhat light and a number of the shippers are having difficulty getting coal forward fast enough to take care of vessels promptly on arrival.

With the total dumping of the three piers at Hampton Roads amounting to 1,562,330 tons for the month of July, all previous records for heavy dumpings were broken. These figures are about 125,000 tons above those for June, which was the record month. As is usually the case the Norfolk & Western Ry. dumped more coal than the other two roads combined and while both the Chesapeake & Ohio and the Virginian showed an increase over their June figures the Norfolk & Western showed a slight decrease. The movement over the Norfolk & Western piers amounted to 825,910 tons, the Virginian 300,190 tons and the Chesapeake & Ohio 436,230 tons. Of the total July movement the largest percentage of the export coal was taken by Italy, a greater part of this coal being for the railways and navy.

Railroad Tonnages—Dumpings over the local piers for the past several weeks compare as follows:

	Week Ending				
Railroad	Aug. 7	July 10	July 17	July 24	July 31
Norfolk & Western	135,357	174,822	180,090	197,913	188,593
Chesapeake & Ohio	110,861	76,397	116,862	96,627	84,018
Virginian	64,397	57,467	78,710	86,523	39,335
Totals	310,515	308,686	375,662	381,063	311,949

OCEAN FREIGHTS

Plate freights are practically the same as a week ago and a number of charters were effected during this interval at or about recent quotations. Mediterranean freights are firmer owing to the increased demand for steamers for grain; Cuban and West Indian freights are also firmer on account of the scarcity of tonnage available for this business.

The freight market is now quotable as follows:

To	Rate	To	Rate
Havana	$2.75@3.25	Bermuda	**$3.00**
Cardenas or Sagua	3.00@3.50	Vera Cruz	3.25@3.75
Cienfuegos	3.25@3.50	Tampico	3.25@3.75
Port au Spain, Trinidad	3.50	Rio	8.40@8.64
St. Lucia	3.25@3.50	Santos*	8.40@8.88
St. Thomas	3.00	Montevideo	8.16
Barbados	3.50	Buenos Aires or La Plata	†8.16@8.24
Kingston	3.00@3.50	Rosario	8.40@8.64
Curacao	3.25	West Coast of Italy	9.36@9.60
Santiago	3.25@3.50	Barcelona**	8.64@8.88
Guantanamo	3.25@3.50	Valparaiso or Callao	6.50@7.00
Demerara	4.50@5.00	Marseilles	8.88@9.12

Note—Rates noted in **bold face** type are only approximate.

* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British steamers. Neutral steamers are more difficult to obtain and the rates are always higher. Neutral owners prefer Buenos Aires.

W. W. Battie & Co.'s Coal Trade Freight Report.

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge. 24c. per net register ton per day demurrage."

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	To	Tons	Rate
Rosebank	Valencia	2470	
Nordland	Cardenas	1042	
G. E. Klinck	Eastport	460	$1.35
Geo. Pyman	Barcelona	2508	
E. E. Briny	Fort de France	1408	
Theenline	Cay Francis	850	
A. B. Mitchell	Portsmouth, N. H.	397	.90
A. J. Trainer	St. John, N. B.	336	
Orkild	Cuba	1622	
Glenmount	Cuba	1246	

BALTIMORE

Vessel	To	Tons	Rate
Titania	Italy	2173	
Antwerpen	Denmark	1026	
Siljerstad[1]	River Plate	2680	$8.22
Corby[1]	River Plate	2279	8.22
Falk[2]	Santa Marta	1125	
Llongwen	Italy	3013	9.12
M. Med't'r.	Spain	1939	
Northmount	Havana	1172	
J. A. Hooper	San Diego	1321	

BALTIMORE

Vessel	To	Tons	Rate
Ruth	Tampa	2423	
Commonwealth[1]	River Plate	2183	8.28
Camlake[1]	Italy	2086	8.64
St. Andrew	Sweden	3500	

[1] Or Virginia. [2] Colombia.

VIRGINIA (Including Hampton Roads)

Vessel	To	Tons	Rate
S. Palmer	Lisbon	2357	
Lexie	Montevideo	2375	$8.16
Siljerstad[1]	River Plate	2680	8.22
Corby[1]	River Plate	2279	8.22
Tancred	St. Lucia	2231	
Skogland	Colon	1898	
Commonwealth[1]	River Plate	2183	8.28
Camlake[1]	Itly	2086	8.64

[1] Or Baltimore

ATLANTIC RANGE

Vessel	To	Tons	Rate
Orion	Italy	2081	$.12
Nikolaos	Marseilles	2777	8.88
G. E. Dudley	Halifax	387	1.90

Note—Steamers are indicated by **bold face type,** all others being schooners.

VESSEL CLEARANCES

The following steamers have cleared from Hampton Roads July 30 to Aug. 6:

NORFOLK

Vessel	Destination	Tons
Alcana[1]	Puerto Plata, A. R.	5012
Weiringen[2]	Buenos Aires	4193
Skogstad	Canal Zone	5600
Elio	Genoa	4750
E. Starr Jones	Pernambuco	1270
Goulandris	Maddalena	5140
Affinita	Maddalena	197
Ulysses	Canal Zone	12,000
Chas. A. Campbell	Para	2142
Tabor	Canal Zone	5500
Andriana	Buenos Aires	4160
Celia	Coronel	800

NORFOLK

Vessel	Destination	Tons
Hermod	Bridgetown	5000
Fortunata	Bagnoli	3700
Chas. G. Endicott	Maranham	1040

NEWPORT NEWS

Vessel	Destination	Tons
Boniface	Para	1038
Berwindmoor	Spezia	7100
Vulcano	Genoa	7300
Nea Hellas	Piraeus	5600
Tancred	Port Castries	5500

[1] Smokeless Fuel Co. [2] W. Va. Coal Co.

LAKE MARKETS

PITTSBURGH

Demand slightly increased and sentiment decidedly better, with contract prices a shade stiffer. Operations at 50 to 60% of capacity.

There has been a slightly heavier demand for coal, in the aggregate, but there is still plenty of free coal in the market and prices for prompt shipment are not sensibly advanced. The consumption of the steel trade is large and has increased somewhat even in the past week, while as the mills get into smoother running order and approach the cold weather it is likely the coal consumption of the industry will pass all records.

General business shows an improvement, and the local coal trade has become decidedly more hopeful as to the future, and somewhat stiffer in its views as to contract prices. The lake movement continues light and it is now doubted whether there will be any substantial increase in the rate of shipping at any time in the remainder of the season. The Pittsburgh district continues to turn out coal at between 50 and 60% of capacity. The demand on the Connellsville district for export coal is about the same as formerly.

Pittsburgh district prices for prompt coal remain substantially as follows: Slack, 50@55c.; nut and slack, 90@95c.; nut, 95c.@$1; mine-run, $1@1.05; ¾-in., $1.10@1.15; 1¼-in., $1.20@1.25, per net ton at mine, Pittsburgh district. On contract to Apr. 1 mine-run is $1.05@1.15 and slack about 95c.

BUFFALO

Bituminous improving very slowly. No improvement in sight in anthracite. Some promised near the end of the month.

Bituminous—There is a steady increase in the demand, but it comes slow. The fall trade is expected to be good, though the promise is not very positive yet. Some of the Allegheny Valley operators are now running half time and others are complaining of unsold coal on track. The shippers agree that the demand comes in strong some days and then drops off almost entirely. There are a good many iron furnaces, some of them idle for years, that are starting up and they will force a general activity if they go on.

There is a perceptible improvement in the slack market. This was occasionally selling as low as 30c. a ton awhile ago, and now it sometimes brings 75c. This means that the very low figure is gone and will not return unless the market weakens again. Bituminous is still quotable at $2.70 for best Pittsburgh lump, $2.55 for three-quarter, $2.45 for mine-run and $2.25 for slack. Allegheny Valley sizes are 25c. below Pittsburgh. The slack has not been quite as strong lately as Pittsburgh slack, but it is reckoned on a par with it in price generally.

Anthracite—At present the Upper-Lake docks are not eager for cargoes, but the shippers are putting them in wherever they find room. The amount loaded here for the week again shows an increase, being 122,850 tons, which is a fair amount for midsummer. Some of the shipping docks are more active than they have been for a long time. It will be sometime before the city anthracite trade is active. Dealers have turned their attention to other business so far as possible and will let the trade take care of itself till fall.

COLUMBUS

Trade shows a little more activity in both domestic and steam lines. More stocking and retailers are buying to take care of the demand. Prices unchanged.

A slight improvement is reported during the past week. This is especially so in domestic circles where trade is increasing in volume. The tone of the market appears to be better all along the line and coal men generally believe that future prospects are brighter.

In steam lines there is also an improvement as manufacturing is growing better. Requisitions for manufacturing plants are larger and there is a tendency among purchasing agents to increase stocks. Railroads are taking a fair amount of fuel as the freight movement is increasing. Buying off the open market is still a rule in certain sections but some of the consumers are now showing a disposition to contract though only a few contracts are expiring. One of the best features is the absence of extremely low prices as was the case several months ago.

Threshing in rural sections is now at its height which means a large consumption of coal. Rural dealers have been hurrying up orders as they are selling more coal than usual. The wheat and oats harvests are unusually big.

Many of the larger domestic consumers in the cities are laying in their winter's supply of fuel and retail trade is active. There is a better demand because of the failure of natural gas in previous winters and householders are returning more and more to the use of coal.

The Lake trade is not very active as there is still a large quantity on the docks at the upper ports. The movement to the interior is slow. Many of the larger Lake producers are not taking any part in the trade as they do not wish to invest any more money.

The anthracite trade is more active in central Ohio territory. Many of the shippers report an increase of fully 50% in the demand as compared with previous seasons. This is especially true of certain residence sections of the larger cities.

Prices in the Ohio fields are as follows:

	Hocking	Pomeroy	Kanawha	Eastern Ohio
Rescreened lump	$1.45	$1.50		
Inch and a quarter	1.35	1.35	$1.30	$1.25
Three-quarter inch	1.25	1.25	1.25	....
Nut	1.15	1.25	1.15	....
Mine-run	1.05	1.10	1.05	1.00
Nut, pea and slack	.65	.70	.65	.60
Coarse slack	.55	.60	.55	.50

Mines have been working at about the following percentages of full capacity:

District	Week Ended July 17	July 24	July 31	Aug. 7	District	Week Ended July 17	July 24	July 31	Aug. 7
Hocking	25	25	15	25	Cambridge	35	25	30	30
Jackson	25	20	20	20	Masillon	30	25	25	25
Pomeroy	40	40	35	25	Eastern O.	50	55	50	30
Crooksville	20	20	20	30	Average	32	30	29	30

TOLEDO

Both steam and domestic markets slightly better. Crops injured by heavy rains.

The general improvement in the demand for coal continues though it is not extensive. The steam trade is showing some awakening although buying is very conservative. Many large concerns continue picking up bargain coal. There has been no indication here of any congestion nor does there seem to be any possibility of such a contingency. The heavy rains of the past two weeks has affected the crops noticeably.

The Lake movement is lighter than it was and it has at no time this season been up to normal. Pocahontas coal is still in good demand but it is claimed that there is some shading of the increased August prices.

CINCINNATI

Domestic business slightly improved, although buying is still in small volume. Steam demand dull.

While the movement of the prepared grades is not up to normal, there has been a slight increase during the past week. Poor credit conditions among domestic consumers are probably responsible in part for slow buying by retailers, but stocks are so low that there must be a steady increase in buying from this quarter. The Lake trade is lagging behind normal. The improved domestic situation has not helped the domestic market and the additional screenings have been difficult to place. Consumption among manufacturers in this section is not what it should be.

LOUISVILLE

Slight activity due to some delayed buying. Prices firmer, though no higher.

A considerable improvement is noted in the Kentucky field, though principally as to the volume of business done rather than in prices. This is the natural increase which could not well be delayed longer and which in normal years is closed up before now.

Prices continue virtually unchanged, block ranging from $1.25 to $2, according to quality, etc., though it is said that there is more being sold on the higher levels than heretofore. Nut and slack is showing no variation of note.

COKE

CONNELLSVILLE

Prompt furnace coke has slumped further and contract quotations have become nominal. Iron and steel conditions improved, but Connellsville coke market evidently affected by continued erection of byproduct ovens. Production and shipments increased.

The general tone of the coke market has softened further. The surplus stocks already mentioned have not been dissipated by a decrease in production, as was expected would occur, and prompt furnace coke has been a drug on the market, being freely offered at $1.50 while it is possible that even this price has been shaded in some instances. Nominal asking prices on contract furnace coke are unchanged, but there has been no serious test as inquiry has amounted to practically nothing.

The operators are still convinced that there will be a heavy demand later, and fancy prices by the close of the year, based on the increasingly favorable developments in the iron and steel markets, but they have been expecting an improvement in coke for a long time without encountering tangible results. It is certainly anomalous that Connellsville coke should remain so low, when the steel mills are operating practically at capacity, and a firm pig-iron market has turned in the past fortnight into a sharply advancing one.

The only explanation is that byproduct coke has entered the situation so largely as to make it improbable, in the minds of buyers, that Connellsville coke can become scarce. Corrigan, McKinney & Co. last week signed a contract for 200 Koppers byproduct ovens, to be erected as rapidly as possible at the firm's site in Cleveland, where two merchant furnaces are in operation and two more, with a steel plant, are under construction, to be finished early in the new year. The 200 ovens are to supply all four of the blast furnaces.

The Connellsville coke market stands as follows, contract furnace quotations being practically nominal: Prompt furnace, $1.50; contract furnace to Oct. 1, $1.75; to Jan. 1, $1.85@2; prompt foundry, $2.20@2.40; contract foundry, $2.25@2.60, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended July 31 at 377,410 tons, an increase of 10,315 tons, and shipments at 373,182 tons, an increase of 12,230 tons.

Buffalo—There is a continuation of the good feeling in the trade, backed by many reports of a genuine stir in iron and steel. If this continues there will be as much coke called for as the ovens will want to turn out and prices will be firm. The price is advancing and nothing of fair quality can now be had at former quotations. The basis is best 72-hr. Connellsville at $4.30, with stock coke $3.35.

Chicago—Gas house coke is quiet, but byproduct egg, stove and nut have been in steady demand at good prices. Foundry coke has assumed a more determined stand, and prices are well maintained. Quotations are as follows: Byproduct, $4.65@5.10; Connellsville, $4.75; Wise County, $4.65@4.75; gas coke, $3.75@3.90, furnace, $4.85.

MIDDLE WESTERN

GENERAL REVIEW

Western situation quiet and shipments delayed by rainy weather. Confidence expressed in immediate future. Smokeless coals still virile. Western steam sizes slow. Anthracite dull.

The midsummer demand has not bettered this week. Continuous rainfalls are proving detrimental to a normal absorption of tonnage and have delayed threshing. Roads in the country districts are in such a condition that hauling cannot be done. About three weeks of hot dry weather is now needed. The backwardness of harvesting in the northwest is also causing delayed movement to that section.

But despite adverse weather conditions, there is some improvement on a small scale. Steel and manufacturing plants which take a considerable amount of coal are showing more activity; many steel plants in this territory are now operating to capacity, and allied manufacturing lines are showing sympathetic improvement. Evidently heavy movement of both grain and coal will occur simultaneously this year, and this may cause a serious congestion. The steam trade, however, is still behind the domestic.

The Chicago market is absolutely bare of consignment coal, which shows a healthy state of affairs. Screenings are if anything lower than last week, averaging between 65c. and 70c., with some shipments made at 60c. It is felt that the improvement shown in the industrial situation and settlement of building trade strikes in Chicago, will serve to strengthen the screenings market very shortly. An advance in the prices of domestic sizes became effective with many operators Aug. 1.

An increase is noted in the number of small orders which seems to indicate awakening interest on the part of the little consumer. In view of the general draggy conditions this summer, prices have remained remarkably steady. Although the demand is quiet, it is well established that there are very small stocks throughout the country districts, and as soon as the buying season once gets in full swing, there can hardly be any question but that the market will improve quickly.

CHICAGO

Price advances have little effect. Indiana grades especially slow. Anthracite heavy and no decision expected on the new rates for some time.

The marking up of 10c. per ton on Southern Illinois coarse sizes effective Aug. 1 has had but little apparent effect as yet. Carterville operators are also asking $1.60 for lump and egg, and $1.65 for No. 1 washed, while most of the operators in Williamson County are seeking to obtain $1.50, with a good many shipments going forward at from $1.35 to $1.40. Screenings are ranging around 65c. to 70c., and if fine coal continues downward, many Southern Illinois operators will probably store screenings on the ground pending a better outlook. The Saline County mines are running about half time, with no change in prices, and domestic shipments are rather slow.

No changes have been announced in Springfield district prices. Railroad tonnage for these mines has been somewhat below the minimum the last two weeks. Domestic lump shipments have been very slow, but screenings have gone forward in steady volume at prices ranging around 60 to 70c.

The demand for Indiana coal in this market is below normal and less shipments are going to Northwestern points. It was expected that there would be a revival of buying early in August, but it has not appeared. Domestic buying is slow, and the dealers have shown no tendency to place storage orders of any consequence as yet.

Pocahontas and New River smokeless coals are still very strong and active, although sales agents expected a lull in the demand. Lump and egg are firm at $2.25, and mine-run, $1.40. Splint is firmer.

Pennsylvania smokeless is being sold freely at July prices, but it is rumored a new circular will shortly be issued raising quotations.

Hocking lump is moving very slowly. There is a large tonnage of these coals at upper lake ports. Prices are fairly well maintained in the face of the adverse conditions.

The keen competition for tonnage by the Kentucky shippers causes sales at most any price, and the situation still continues unhealthy. Lump coal is sold all the way from $1.25 to $1.90, but the range is not so wide on other sizes.

It is said that the Interstate Commerce Commission will not make a decision as to the reasonableness of the 25c. advance in anthracite rates to Chicago until the case of the general anthracite rates and practices has been made public. Anthracite is very slow, and all-rail shippers to Chicago are absorbing the 25c. advance in freight rates, making no change in Chicago delivered prices, in order to compete with the docks. Buying at the end of July was of little moment, but there are some reports to the effect that the middle of August will see a considerable number of orders placed from the Chicago district and Ilinois points. Many inquiries have been made of wholesalers here regarding the effect the rate advance would have on prices, and asking for advice as to whether or not stocking should be done in August.

Quotations in the Chicago market are as follows:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump......	$1.50@1.60	$1.35@1.50	$1.35@1.50	$1.25@1.50	$1.40@1.50
Steam lump	....	1.25	1.15@1.30	1.15@1.25	1.15@1.25
2½ and 3-in. lump	1.25@1.35	....	1.25@1.35	1.25@1.35	1.25@1.35
1¼-in. lump.	....	1.25	1.15@1.25	1.15@1.25	....
Egg	1.50@1.60	1.35@1.50	1.15@1.25	1.10@1.15	1.10@1.25
Nut	1.40@1.50	1.25@1.35	.95@1.10	.90@1.10	1.00@1.10
No.1washed	1.40@1.50	....	1.45@1.50	....	....
No.2washed	1.25@1.35	....	1.35@1.45	....	....
No. 1 nut..	1.50@1.60	....	....	....	....
No. 2 nut..	1.40@1.50	....	....	....	....
Mine-run...	1.10	1.05@1.10	.85@ .95	.85@1.00	.85@1.05
Screenings..	.60@ .70	.65@ .75	.60@ .75	.65@ .70	.65@ .75

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump......	$1.35@1.50	$1.25@1.90	$2.25	$1.75@2.00	$1.40@1.60
1¼-in. lump.	1.15@1.25	1.25@1.35	....	1.25@1.50	1.25@1.35
Egg	1.35@1.50	1.15@1.35	2.25	1.25@1.35	1.00@1.10
Nut.......	....	.90@1.10	1.75..	....	....
No. 1 nut..	1.25@1.35	....	....	....	....
No. 2 nut..	1.25@1.35	....	....	....	....
Mine-run...	1.10	.90@1.15	1.25@1.45	1.25@1.35	.90@1.05
Screenings..	.60@ .70	.50@ .70		....	....

West Va. Splint 3 and 4-in lump, $1.25@1.35; 1½-in lump, $1.15@1.20.

Lake Receipts—Receipts by Lake for the week ended Aug. 10 and for the season, this year and last year, were as follows:

	1915		1914	
	Hard	Soft	Hard	Soft
Buffalo..................	13,097	8,771	30,486	......
Oswego..................	5,402	......	4,600	......
Cleveland..............	......	10,029	......	6,448
Ashtabula..............	9,050	16,831	......	......
Toledo..................	......	1,615	......	9,450
Sandusky..............	......	9,137	......	10,231
Week's total..........	27,549	46,383	35,086	26,129
August total..........	27,549	55,388	55,632	31,429
Season total..........	406,948	282,628	357,344	367,737

PRODUCTION AND TRANSPORTATION STATISTICS

ANTHRACITE SHIPMENTS

Anthracite shipments for July and the first seven months of 1914-15 were as follows:

	July 1915	July 1914	7 Months 1915	7 Months 1914
Phila. & Reading	839,554	831,965	6,252,825	6,863,613
Lehigh Valley	1,024,611	1,026,225	7,324,459	7,181,300
Cent. R.R. of N.J.	597,992	708,891	4,396,841	5,097,978
Del. Lack. & West	542,775	826,771	5,111,383	5,425,277
Del. & Hudson	697,803	671,682	4,501,595	4,087,557
Pennsylvania	369,550	406,760	3,339,504	3,623,848
Erie	660,010	717,201	4,407,092	4,707,228
Ont. & Western	201,910	202,362	1,195,810	1,350,845
	4,934,205	5,391,857	36,529,509	38,337,646

Stocks at Tidewater July 31 were 636,384 tons.

SAULT STE. MARIE

Anthracite shipments through the Sault Ste. Marie Canals for July amounted to 315,374 tons and bituminous 1,759,178 tons.

THE CAR SITUATION

The total surplus of idle coal cars as of Aug. 10 was 74,488 and the shortage 414.

I. C. C. No. 6429—Parlin & Orendorff Co. vs. Cleveland, Cincinnati, Chicago & St. Louis R.R. Co., Et al.

Carload rate of $1.60 per ton on coke from Indianapolis, Ind., to Canton, Ill., not found unreasonable or unjustly discriminatory. Complaint dismissed.

Investigation and Suspension Docket No. 525—Coal rates from Illinois Mines to Omaha, Neb, and other points.

Proposed increase, from $2.05 to $2.25 per net ton, in the rate on bituminous coal from points on the Southern Railway in the Belleville district in Illinois to Omaha, Neb., and points grouped therewith, found to have been justified.

I. C. C. No. 7408—Reeves Coal Co., vs. Pere Marquette R.R. Co., et al.

A shipment of bituminous coal en route from La Follette, Tenn., to Vermilion, S. D., was ordered reconsigned to Ghent, Minn. Defendants failed to effect the reconsignment and higher charges were collected than would have accrued if complainant's instructions had been followed. Reparation awarded.

FOREIGN MARKETS

GREAT BRITAIN

July 30—The attention of the coal industry during the past week has been concentrated upon the Government's legislative efforts to limit prices, the chief new feature of which has been the decision of Mr. Runciman, at the eleventh hour, to partly include existing contracts within the scope of the act, after repeatedly declaring that he could consider nothing of the kind. No doubt the measure will cause much dissatisfaction in various ways, but the whole industry will doubtless be relieved to find that it knows the worst. The passage of the bill, which received the Royal assent yesterday, will at least enable traders to realize their actual position under the new measure and afford a basis upon which much business, which was suspended pending definite knowledge as to the intentions of the Government, can now be completed.—"The Iron and Coal Trades Review."

July 29—Business is virtually at a standstill as colliery owners are unable to accept fresh orders for prompt delivery. Colliery outputs are limited and as the authorities are taking a large proportion of the production, there is no prospect of a change for some little time. The following are the nominal quotations:

Best Welsh steam	Nominal	Best Monmouthshires	$6.96@7.20
Best seconds	Nominal	Seconds	6.72@6.96
Seconds	$6.96@7.20	Best Cardiff smalls	5.37@5.64
Best dry coals	6.72@7.20	Cargo smalls	4.44@4.80

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—Chartering is much restricted owing to the scarcity of coal. Rates are nominally as follows:

Gibraltar	$3.36	Naples	$3.96	St. Vincent	$4.32
Marseilles	3.48	Alexandria	4.20	Rio de Janeiro	5.52
Algiers	3.89	Port Said	4.08	Monte Video	5.28
Genoa	3.90	Las Palmas	4.08	River Plate	5.52

FINANCIAL

St. Louis Rocky Mountain & Pacific Co.

(Seventh Annual Report—Year ended June 30, 1914.)

President J. van Houten reports for the year ended Sept. 15 as follows:

Results—The gross earnings were $2,457,178 [showing an increase of $217,694]; net earnings, $823,517. After deducting fixed charges, reserves for depreciation, etc., there is a net income for the year of $229,180.

Reduction of Liabilities—The company paid to the sinking fund Apr. 1, 1914, 3c. per ton on all coal mined during the preceding year, with which the trustee purchased and retired $47,000 bonds. Two-thirds of this amount was voluntarily paid in, as the mortgage requires the payment of only 1c. per ton of coal mined.

Improvements and Betterments—The disbursements during the year for improvements, betterments, additions, equipment, etc., at all the mines aggregated $109,886, of which $55,710 went for electrical equipment and power plants.

Sale of Railway—Change in Mortgage—The bondholders have been advised by circular of the plan of the directors (a) to sell the property of the St. Louis Rocky Mountain & Pacific Ry. to Atchison, Topeka & Santa Fé Ry. Co. for $3,000,000 Atchison 4% first mortgage gold bonds (a first lien on the property sold), and $50,000 in cash; and (b) to amend the gold mortgage of July 1, 1905, in a manner to enable the sale, to increase the annual sinking-fund payment to 3c. per ton of coal mined instead of 1c., and also to terminate the authority to issue additional bonds for extensions or betterments of the railway.

Electric Power—Your board has contracted with the Trinidad Electric Transmission Ry. & Gas Co. for all of the power used at your mines at a figure, which will not only enable us to make some saving in operating cost, but will also diminish the cost of opening new mines from time to time, as it will do away with the necessity of building individual power plants.

Dividends—The regular 5% for the year was paid on the preferred stock and 1% was paid on the common stock.

Outlook—The condition of our properties is satisfactory in every way. The market for coal in the Southwestern portion of the United States showed some improvement, and for coke a substantial increase over previous year, but there was almost a complete suspension of shipments to smelters, railroads and other customers in Mexico on account of the war and unsettled conditions in that country.

INCOME ACCOUNT FOR YEARS ENDING JUNE 30

	1913–14	1912-13	1911-12	1910-11
Coal mined (tons)	(?)	1,326,521	1,167,985	1,257,052
Coke produced (tons)	(?)	153,510	69,655	103,327
Coal and coke sales rev. from transport'n, etc.	$2,276,868	$2,141,9313	$1,812,573	$2,010,115
Cost, expenses and taxes	1,633,661	1,621,999	1,304,819	1,382,125
Net earnings	$643,207	$519,914	$507,754	$627,990
Other income	180,310	97,571	98,335	88,508
Total net income	$823,517	$617,485	$606,089	$716,498
Interest charges	468,894	385,956	388,368	372,168
Other deductions				14,952
Reserved for depreciation and renewals	107,443	113,294	101,700	101,912
Pref. dividends (5%)	50,000	50,000	......	......
Common dividends (1%)	100,000	......	......	......
Surplus	$79,180	$68,235	$116,021	$227,466

CONSOLIDATED BA:ANCE SHEET, JUNE 30

Assets—	1914 $	1913 $
Property and equipment	a12,285,762	a19,448,630
Invest. in sub. cos	301,782	320,877
Invest. in and adv. to St. L. R. Mt. & Pac. Ry.	a7,234,201	a
Cash	413,810	389,560
Accts. receivable	242,579	245,088
Coal and coke on hand	11,543	11,449
Sundry accounts	13,201	9,532
Mater. and supplies	24,322	86,742
Total	20,527,200	20,511,878

Liabilities— St. L.R.M. & P. Co.	1914 $	1913 $
Common stock	10,000,000	10,000,000
Preferred stock	1,000,000	1,000,000
First M. bonds	7,559,000	7,606,000
Accts. and wages pay	160,530	153,159
Notes payable	....	10,000
Accured int., etc.	190,425	190,900
Pref. stock divs.	12,529	12,561
Sundry accounts	23,483	8,237
Reserved for depr	535,583	561,549
Surplus	1,045,650	969,471
Total	20,527,200	20,511,878

a The St. Louis Rocky Mountain & Pacific Ry. Co. is being operated by the Atchison, Topeka & Santa Fe Ry. under an option to purchase prior to July 1, 1915, the consideration being $3,000,000 4% bonds of A. T. & S. F. Co., payable as of Aug. 1, 1913; also a cash payment of $50,000 for materials and supplies on hand Aug. 1, 1913.

Note—For previous annual report of the company see Vol. V, p. 924.

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

+Indicates contracts regarding which official information has been received.

Recast

In the following table we give a list of all old contracts coming up for consideration during the ensuing week. The table gives our contract number, the name of the purchaser, city, tonnage and page on which the detail notice appeared.

No.	Purchaser	City	State	Tonnage	Page
1012	Geo. M. Kellogg Co.	Pleasant Hill	Mo.	20 (cars)e	243
1034	Board of Education	Youngstown	Ohio	5,000	243
1043	L. A. Budlong Co.	Chicago	Ill.	12(cars)	116
1048	Colin Gardner Paper Co.	Middletown	Ohio	50,000	116
1123	Indiana State Sch. of Deaf	Indianapolis	Ind.	4,000a	158
1198	Ohio B. Administration	Columbus	Ohio	20,000	244
1206	E. D. Skinner	Sawyer	N. D.	100	244
1210	The County Government	Buffalo	Minn.	100a	245

a Indicates bituminous. [2] Per month.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

1021—Kansas City, Mo.—The Western Sash & Door Co. announce that they will not contract as previously noted (p. 77). Address, F. J. Huttig, Western Sash & Door Co., Independence Rd. & White Ave., Kansas City, Mo.

1050—Kansas City, Mo.—Baker & Lockwood advise that no definite time has been set for letting this contract (p. 116), and that they may confine their purchases to the open market. Address Pur. Agt. C. R. Summerville, Baker & Lockwood, Wyandotte and 6th St., Kansas City, Mo.

+1051—Zanesville, Ohio—This contract (p. 116) will be let to local dealers who are able to make deliveries to the school buildings as required. Address Clk. C. J. Weaver, Bd. of Edu., Zanesville, Ohio.

+1058—Plymouth, Mass.—Bids have been received on this contract (p. 116), which provide for furnishing the county commissioners with coal, as follows:

	Lehigh Egg Coal	Pocahontas or Equal Grade
E. P. Reed Lumber Co., No. Abington	$6.40@6.60	$4.95
D. H. Craig, Plymouth	6.65	4.25
James Millar & Co., Plymouth	6.95	...
E. M. Alden Co., 94 Milk St., Boston	6.45@6.65	4.20

No notice has been received of any award as yet. Address County Comr. Lyman P. Thomas, Plymouth, Mass.

1060—Louisville, Ky.—This contract (p. 116), which provides for furnishing B. F. Avery & Sons with six months' supply of nut and slack coal, will not be awarded until about Aug. 15. Address Pur. Agt. J. W. Roelker, B. F. Avery & Sons, Louisville, Ky.

+1068—New York, N. Y.—All the bids on this contract (pp. 117, 243) have been rejected and new bids requested, which were opened Aug. 13. The amount of tonnage involved has been reduced from 3000 gross tons of egg coal to 1500 tons. Address Dock. Comr. R. A. C. Smith, Pier A, North River, New York.

+1125—Columbus, Ohio—All the bids on this contract (p. 158), which provides for furnishing the Department of Public Safety with 1250 tons of the best quality lump coal, have been rejected because of the reduction in freight rates of 15c. on the Hocking Valley Ry., which it is believed will affect the cost of the coal here. The new bids have been readvertised for and will be opened Aug. 17. The bids received on the present schedule were as follows: General Hocking Fuel Co., Columbus, West Virginia mine-run, $1.60; Hatton, Brown & Co., Columbus, Logan nut and slack, $1.45; Logan mine-run, $1.71; John M. Taylor Coal Co., Columbus, Hocking mine-run, $1.55; National Coal Co., Cleveland, Cambridge Hocking mine-run, $1.70; Victoria Coal Co., Columbus, Hocking nut, pea and slack, $1.23; Hocking mine-run, $1.53; New York Coal Co., Columbus, Hocking mine-run, $1.65; Moreland Coke Co., Pittsburgh, West Virginia mine-run, $1.58; Fletcher, Willaims Coal Co., Columbus, West Virginia nut, pea and slack, $1.12; West Virginia mine-run, $1.45; Elk Coal Co., Columbus, Cambridge Hocking, mine-run, $1.44; Hocking mine-run, $1.48; E. A. Cole & Co., Columbus, West Virginia mine-run, $1.64; Hocking mine-run, $1.64. Address Dir. of Public Safety B. L. Bargar, City Hall, Columbus, Ohio.

+1143—Spokane, Wash.—Bids on this contract (p. 199), which provides for furnishing coal for Lewis and Clark and North Central High Schools and Boulevard Park School were received until 7:30 p.m., Aug. 9. A certified check for $100 was required with each bid. Address Secy. E. A. Thomas, Bd. of Edu., Spokane, Wash.

+1146—Wichita, Kan.—This contract (p. 199), which provides for furnishing the local Board of Education with approximately 2500 tons of bituminous and semibituminous coal will be awarded Aug. 16. Address Clk. J. L. Leland, Bd. of Edu., City Hall, Wichita, Kan.

New Business

+1233—Dickinson, N. D.—The School Board at this place received bids until noon Aug. 10 for furnishing 500 tons of either mine-run or screened lignite coal, to be delivered at the local school buildings during the ensuing year. The successful bidder will be required to furnish a bond for $200. Address Clk. L. R. Merritt, Bd. of Edu. Dickinson, N. D.

1234—Kansas City, Mo.—The Consumers Bread Co. at this place consumes about 150 tons of coal per month, which they are at present buying in the open market, but are willing to consider a proposition for contracting. Cherokee slack coal is used. Address Pres. B. Howard Smith, Consumers Bread Co., Orear-Leslie Bldg., Kansas City, Mo.

1235—Chicago, Ill.—The American Linseed Co., of South Chicago, will contract about Sept. 15 for their annual requirements of coal, involving approximately 15,000 tons. Illinois or Indiana mine-run coal is used, and the contract will extend over one year. Address Purchasing Agent, American Linseed Co., South Chicago, Ill.

1236—Kansas City, Kan.—The packing house of Sulzberger & Sons at this place will not enter into a contract this year, but are willing to consider propositions to furnish their fuel requirements. They consume about 200 tons of slack coal per day. Address Purchasing Agent, Sulzberger & Sons, Kansas City, Kan.

+1237—Hamilton, Ohio—The Municipal Light and Power Plant at this place usually contracts some time in September for their annual requirements of coal, amounting to from 10,000 to 15,000 tons. Nut and slack grades are required and the usual price is $1.80 per ton. Address J. O'Toole, Municipal Light and Water Plant, Hamilton, Ohio.

+1238—Delaware, Ohio—The Board of Education for Delaware Township will receive sealed bids for furnishing coal required for various school buildings during the ensuing year until 8 p.m., Aug. 14. Bids are requested on Hocking, West Virginia, or Sunday Creek forked coal. Address Clk. E. E. Moeller, Delaware Township, Bd. of Edu. Delaware, Ohio.

+1239—Brookings, S. D.—The Board of County Commissioners, will receive bids until 2 p.m., Sept. 7, for furnishing 100 tons of bituminous, and 20 tons of anthracite coal. Address County Audr. F. H. Ripley, Bd. of County Comrs. Brookings, S. D.

+1240—Bellwood, Penn.—The Board of Education of Bellwood received sealed bids until 8 p.m., Aug. 6, for furnishing approximately 200 tons of bituminous mine-run coal to be delivered to the local school as required during the ensuing year. Address, Secy., E. N. Root, Bd. of School Dirs., School Dist. of Bellwood, Bellwood, Penn.

1241—Kansas City, Mo.—The Atlas Oats Co. at this place is buying coal in the open market, and will probably continue doing so, but is willing to consider a proposition covering two cars of Cherokee lump or nut coal per week. Address Purchasing Agent, Atlas Oats Co., 8th and Santa Fé St., Kansas City, Mo.

+1242—Jamestown, N. D.—The county government will receive bids until 2 p.m., Sept. 1, for furnishing 150 tons of lignite and 75 tons of smokeless. Bids should be submitted f.o.b. cars at Jamestown, and also delivered in bins at the court house. A bid on 20 tons of anthracite stove coal will also be received. Address County Auditor, Jamestown, N. D.

1243—Crystal Falls, Mich.—The Municipal Light and Water Plant at this place usually contracts some time in September for annual requirements of coal amounting to about 150 tons. Furnace coal is used almost exclusively, and the usual price is $8.25 per ton. Address City Clk. W. J. Gribble, Crystal Falls, Mich.

+1244—Delaware, Ohio—The county commissioners received sealed bids up to noon, Aug. 9, for furnishing 240 tons of 3-in. coal and 40 tons of washed nut, f.o.b. cars at Leonardsburg, Ohio. Address County Audr. W. D. Aldrich, Leonardsburg, Ohio.

+1245—Missoula, Mont.—The Board of Education at this place received sealed bids until 10 a.m., Aug. 13, for furnishing between 250 and 300 tons of coal to the high school building or gymnasium as may be required during the ensuing year. Address Secy. A. J. Violette, Bd. of Trustees, County High School, Missoula, Mont.

+1246—Fairmont, N. D.—The School Board here received bids until noon, Aug. 10, for furnishing two carloads of stove coal, one to be delivered in August and the other in January. Address Clk. F. E. Crafts, Bd. of Edu., Fairmont, N. D.

+1247—Jacksonville, Ill.—The Board of Education here received sealed bids until noon, Aug. 10, for furnishing coal to the public schools during the ensuing year. Mine-run and 3-in. lump are required. Address Clk. R. L. Pyatt, Bd. of Edu., Jacksonville, Ill.

+1248—Lake Park, Minn.—The Board of Education will receive bids until 6 p.m., Aug. 16, for furnishing 60 tons of Hocking Valley lump coal to be delivered on or before Sept. 1. Address Secy. Kristofer Delager, Bd. of Edu., Lake Park, Minn.

+1249—Ellwood City, Penn.—The Board of Education received sealed bids until 8 p.m., Aug. 13, for furnishing three-quarter lump, mine-run, pea and slack coal, to be delivered to the local schools as follows: Lawrence, 125 tons; Central school, 100 tons; West End, 50 tons; Circle, 50 tons; North Side, 40 tons. Address Secy. W. J. Moore, Bd. of Edu., Ellwood City, Penn.

+1250—Falls City, Neb.—The Board of Education received bids until Aug. 12 for furnishing 250 tons of steam coal for the high school and 125 tons of screened lump for the other buildings, 75 tons of lump coal to be delivered immediately and 50 tons the first of the year. Address Secy. F. Brecht, Bd. of Edu., Falls City, Neb.

1251—Redfield, Iowa—The Independent School District will receive bids until 2 p.m., Aug. 16, for furnishing approximately 100 tons of coal, one carload to be delivered by Sept. 15 and the balance as required. Address Clk. R. V. Seaman, Independent School District, Redfield, Iowa.

1252—Minot, N. D.—Sealed bids were received until 2 p.m., Aug. 10, for furnishing lignite coal to Schools Nos. 1, 2, 3 and 4 of the Burlington School District No. 7. Address Clk. W. E. Gross, Burlington School District No. 7, Minot, N. D.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

+No 691—Watervliet, N. Y.—This contract (Vol. 7, pp. 877, 1083), which provides for furnishing the Watervliet Arsenal with coal during the year ending June 30, has been awarded to the **Peterson & Parker Coal Co.,** Troy, N. Y., on the following basis: Bituminous steam, $3.50; anthracite pea, $3.95; buckwheat No. 1, $3.20 and No. 2, $2.40. Address Col. W. W. Gibson, Ordnance Dept., United States Army, Watervliet Arsenal, Watervliet, N. Y.

+No. 801—Henderson, Ky.—This contract (Vol. 7, pp. 1005, 1126, Vol. 8, p. 198), which provides for furnishing the local electric light station with approximately 9000 tons of pea and slack coal has been awarded to **R. A. Powell** of the St. Bernard Mining Co., at 85c. per ton. Address Supt. L. P. Hite, Municipal Light Station, Henderson, Ky.

+No. 821—Cranston, R. I.—This contract (Vol. 7, p. 1049, Vol. 8, p. 243), which provides for furnishing the local city government with approximately 1000 tons of white ash egg and stove coal has been awarded to the **Robert E. Smith Co.** and the **Eastern Coal Co.,** both of whom bid $6.36 per ton. H. C. Banows & Sons bid $6.74 per ton and the United Coal Co., $6.65 per ton. Address Deputy City Clk. L. A. Smith, Jr., City Hall, Cranston, R I.

+848—Chicago, Ill.—This contract (Vol. 7, p. **1049,** Vol. 8, p. 198), which provides for furnishing the Board of Education with its fuel requirements during the ensuing year has been awarded as follows:

		Ton	Total
	District No. 1		
J. J. Connors	Lump	$2.73	$23,478.00
Edgewater Coal Co	Nut	2.6704	4,539.68
J. J. Connors	Washed nut	2.643	2,643.00
Edgewater Coal Co	Small egg	7.55	528.50
Edgewater Coal Co	Range	7.55	981.50
Edgewater Coal Co	Chestnut	7.80	70.20
	District No. 2		
Worth-Huskey Coal Co	Lump	2.907	11,628.00
Consumers Co	Small egg	7.85	117.75
Consumers Co	Range	7.85	1,703.45
Consumers Co	Chestnut	8.10	40.50
	District No. 3		
Franklin Coal Co	Lump	2.714	24,263.16
J. J. Connors	Screenings	2.20	4,400.00
Consumers Co	Range	7.24	477.84
Consumers Co	Chestnut	7.60	387.60
	District No. 4		
Franklin Coal Co	Lump	2.77	23,558.85
Bunge Bros. Coal Co	Mine run	4.00	120.00
Alwart Bros. Coal Co	Washed nut	2.82	3,666.00
Bunge Bros. Coal Co	Small egg	7.53	579.81
Bunge Bros. Coal Co	Range	7.53	1,046.67
Consumers Co	Chestnut	8.10	275.40
	District No. 5		
Franklin Coal Co	Lump	2.714	30,125.40
Pilsen Coal Co	Mine run	3.805	1,179.55
Consumers Co	Range	7.24	1,766.56
Consumers Co	Chestnut	7.60	372.40
	District No. 6		
Franklin Coal Co	Lump	2.77	12,949.75
Bunge Bros. Coal Co	Screenings	2.22	3,330.00
Consumers Co	Small egg	7.35	661.50
Consumers Co	Range	7.24	1,491.44
Consumers Co	Chestnut	7.60	205.20
	District No. 7		
David Rutter & Co	Lump	2.811	40,492.46
Pilsen Coal Co	Mine run	3.805	1,902.50
Pilsen Coal Co	Washed nut	2.7845	1,392.25
Bunge Bros. Coal Co	Range	7.53	1,039.14
Consumers Co	Chestnut	7.5882	1,487.29
	District No. 8		
Franklin Coal Co	Lump	2.714	45,649.48
Alwart Bros. Coal Co	Washed nut	2.82	3,666.00
Pilsen Coal Co	Screenings	2.205	4,410.00
Bunge Bros. Coal Co	Range	7.53	2.853.87
Consumers Co	Chestnut	7.60	714.40
	District No. 9		
David Rutter & Co	Lump	2.811	35,671.59
Ready & Callaghan C. Co	Mine run	3.70	1,480.00
Bishop-Hamlin Coal Co	Nut	2.7138	4,070.70
Consumers Co	Range	7.5465	754.65
Consumers Co	Chestnut	7.60	448.40
	District No. 10		
Worth-Huskey Coal Co	Lump	2.819	18,464.45
Consumers Co	Mine run	4.05	486.00
Consumers Co	Small egg	7.5465	928.22
Consumers Co	Range	7.434	1,129.97
A. L. Strachan & Son	Chestnut	7.80	413.40
	District No. 11		
Henry Holverscheid & Co	Lump	2.72	16,972.80
Calumet Coal & Teaming Co	Small egg	8.00	600.00
Bishop-Hamlin Coal Co	Range	7.8614	1,100.60
Consumers Co	Chestnut	8.065	306.47
	District No. 12		
Worth-Huskey Coal Co	Lump	2.819	14,489.66
Bishop-Hamlin Coal Co	Screenings	2.1336	5,974.08
A. L. Strachan & Son	Range	7.85	1,004.80
A. L. Strachan & Son	Chestnut	8.00	152.00
	District No. 13		
Bishop-Hamlin Coal Co	Lump	2.837	3,063.96
Consumers Co	Small egg	8.10	405.00
Calumet Coal & Teaming Co	Range	8.50	382.50
Consumers Co	Chestnut	8.35	50.10
	District No. 14		
Bishop-Hamlin Coal Co	Lump	2.806	12,206.10
Consumers Co	Mine run	4.05	364.50
Bishop-Hamlin Coal Co	Nut	2.8377	368.90
Consumers Co	Range	8.10	1,069.20
Consumers Co	Chestnut	8.446	42.23
	John Worthy School		
Worth-Huskey Coal Co	Lump	3.528	2,646.00

Approximate total expenditure for coal, $385,241.38. Address Business Mgr. J. A. Guilford, Board of Education, Tribune Bldg., Chicago, Ill.

+No. 861—Newberry, Mich.—This contract (Vol. 7, p. 1085), which provides for furnishing the Newberry State Hospital with approximately 6000 tons of bituminous and semibituminous coal, as required during the ensuing year, has been awarded to the **Island Creek Coal Sales Co.,** Detroit, Mich., at $3.45 per ton for mine-run coal. Address Secy. Dr. E. H. Campbell, Newberry State Hospital, Newberry, Mich.

No. 930—East St. Louis, Ill.—This contract (Vol. 7, p. 1127), which provides for furnishing coal to the public schools was awarded to the **Frank Maule Coal Co.** of East St. Louis. The coal to be furnished is 2-in. shaker screen lump from the mines of the St. Louis & O'Fallon Coal Co. The Maule bid was $1.59 per ton delivered, which figures 88c. per ton at the mine as the freight is 32c. and the hauling 40c. The other bids were: Helfrich Coal Co., $1.59 for one of the four groups; Donk Bros. Coal & Coke Co., $1.65; Fowler-Senior Coal Co., $1.68; Boehmer Coal Co., $1.68½; Carter Bros., $1.71; R. H. Huschle Coal Co., $1.75. The Maule company had the contract last year at $1.59¾. Address, Board of Education, East St. Louis, Ill.

+No. 951—Knoxville, Tenn.—This contract (p. 40), which provides for furnishing the local Board of Education with its coal supply during the ensuing year, has been awarded to **Church & Co.** Address Fred W. Keith, Bd. of Edu., Knoxville, Tenn.

No. 955—Manistee, Mich.—The Manistee Flouring Mill Co. of this place announces that it has covered its requirements as previously noted (p. 40). No details are available as to prices. Address Pres. G. A. Hart, Manistee Flouring Mill Co., Manistee, Mich.

No. 962—New Orleans, La.—This contract (p. 41), which provides for furnishing the New Orleans Coöperative Butchers' Abattoir with 600 tons of bituminous coal, has been awarded to the **Tennessee Coal & Iron Co.** Address New Orleans Butchers' Abattoir, North Peters and Alabo Sts., New Orleans, La.

+No. 967—Aspinwall, Penn.—This contract (Vol. 8, p. 41), which provides for furnishing the local City Government with about 100 tons of coal per month, has been awarded to the **Cornell Coal Co.** at $1.50 per ton for nut, $1.35 for nut and slack and $1.30 for slack. Address Borough Clk. S. R. Chase, 230 First St., Aspinwall, Penn.

+No. 968—Van Wert, Ohio—This contract (p. 41), which provides for furnishing the local Board of Education with approximately 400 tons of coal has been awarded to **Rupright Bros.** on West Virginia mine-run coal at $2.85 per ton. The coal will be furnished from the company's Fairmount Mine. Address Secy. J. M. Showalter, Bd. of Edu. Van Wert, Ohio.

No. 969—Hillsboro, N. D.—This contract (p. 41), which provides for furnishing approximately 200 tons of Pocahontas smokeless mine-run coal has been awarded to the **Valley Lumber Co.,** at $5.65 per ton. The Monarch Elevator Co. bid $5.88 per ton. Address County Audr. Nels O. Lindaas, Bd. of County Comrs., Hillsboro, N. D.

No. 973—St. Cloud, Minn.—This contract (p. 41), which provides for furnishing the Board of Education with 300 tons of bituminous coal, has been awarded to the **Central Lumber Co.** at $5.50 per ton delivered in the bins. It is understood that the contract will be filled on southern Illinois Coal. Address Secy. Julius Adams, Bd. of Edu., St. Cloud, Minn.

No. 977—Brazil, Ind.—This contract (p. 41), which provides for furnishing the local Board of Education with approximately 100 tons of screened coal during the ensuing year, has been awarded to the **West Side Coal Co.,** on screened block coal at $2.30 per ton. Address Secy. H. D. Falls, Bd. of Edu. Brazil, Ind.

+No. 989—Frankfort, Ky.—This contract (p. 42), which provides for furnishing the State Charitable Institutions with coal has been awarded as follows: Eastern State Hospital, **C. L. Ryley Coal Co.,** $2.10 for mine-run coal; Feeble-minded Institute, **R. A. Brawner,** nut and slack coal at $2.10 per ton; Central State Hospital, **R. C. Tway Coal Co.,** nut and slack at $2.15 per ton; Western State Hospital, **St Bernard Coal Co.,** pea and slack at 89c. per ton. Address Secy. Geo. B. Caywood, Kentucky State Board of Control for Charitable Institutions, Capitol, Frankfort, Ky.

+No. 991—Storrs, Conn.—This contract (pp. 76, 115), which provides for furnishing the Connecticut Agricultural College with anthracite coal has been awarded to **F. H. & A. H. Chappell** at the following figures: 1000 tons anthracite egg $6.80; 200 tons pea at $4.95; 100 tons of stove $6.80; 50 tons nut at $7.05. Address Connecticut Agricultural College, Storrs, Conn.

No. 992—Rock Island, Ill.—This contract (pp. 76, 158), which provides for furnishing the Standard Oil-Cloth Co. with two cars of screenings per week, has been awarded to the **W. G. Block Co.,** Davenport, Iowa. Address Purchasing Agent, Standard Oil-Cloth Co., Rock Island, Ill.

No. 994—Canton, Ill.—This contract (Vol. 8, p. 76), which provides for furnishing the coal required at the Ave. D Pumping Station during the year beginning July 1, has been awarded to **W. S. Middleton** at $1.43¾ per ton for mine-run coal. Address City Clk. Joseph Waugh, Canton, Ill.

No. 995—Cedar Rapids, Iowa—This contract (p. 76), which provides for furnishing the Board of Education with 5000 tons of bituminous and 60 tons of anthracite, has been awarded as follows: **E. E. Pinney Coal Co.,** screenings, $1.91; **W. G. Black Co.,** anthracite, $8.96; **Hawkeye Lumber & Coal Co.,** lump, $3.60. The screenings are to come from Rosehill, Iowa, and the lump from Pyrolite. Address Secy. H. L. Cooper, Bd. of Edu., Cedar Rapids, Iowa.

+No. 998—Kansas City, Kan.—This contract (p. 77), which provides for furnishing the Water Works with approximately 20,000 tons of mill and slack coal has been awarded to the **Wyandotte Coal & Lime Co.,** at $2.20 for Cherokee mill and $2.05 for Cherokee slack coal. The same company obtained the business last year at $2.25 per ton for both mill and slack. Most of the coal will be slack coal. The gross consideration amounts to about $55,000. Address Purch. Agt. Amos Riddle, City Hall, Kansas City, Kan.

+No. 999—Brookville, Ohio—This contract (p. 77), which provides for furnishing the Board of Education with 75 tons of coal, has been awarded to **Theo. Detwiler,** on Pocahontas No. 3 mine-run, at $3.20 per ton. Address Clk. J. M. Grau, Bd. of Edu., Brookville, Ohio.

1002—Lafayette, Ind.—This contract (p. 77), which provides for furnishing the fuel requirements of the Public Works Dept., has been awarded to the **J. M. Clark Coal Co.,** of Lafayette, Ind., on coal from their Lattas Creek mine, which operates on the Linton No. 4 seam, on the following basis: 5000 tons nut, pea and slack, $1.53; 700 tons of mine-run, $2.18; 275 tons of mine-run at $2.08. Address Supt. M. W. Miller, Water Works Dept., Lafayette, Ind.

+1008—Galesburg, Ill.—This contract (p. 77), which provides for furnishing the Knox County Court House and heating plant with coal during the year beginning July 1, has been awarded to the **Spoon River Colliery Co.** and the **Virden Coal Co.** It is understood that the price is $1.65 per ton on a delivered basis for Peoria egg screenings. Address County Clk. F. L. Adams, Galesburg, Ill.

+1011—Ritzville, Wash.—This contract (p. 77), which provides for furnishing the various school buildings with 125 tons of coal has been awarded to the **St. Paul & Tacoma Lumber Co.** at $5.20 per net ton for Roslyn Cascade Special steam coal. Address Dist. Clk. John Truax, School Dist. No. 1, Ritzville, Wash.

1013—Jackson, Miss.—This contract (p. 77), which provides for furnishing the State Penitentiary with coal, has been awarded as follows: **Memphis Coal Co.,** for delivery at Parchman, Miss., $3.50; **Morrison Coal Co.,** for delivery at Oakley, mine-run, $2.95. Address Secy. J. J. Coman, Mississippi State Penitentiary, Jackson, Miss.

1014—Keewatin, Minn.—This contract (p. 77), which provides for furnishing the town government with approximately 5000 tons of coal, has been awarded to the **King Lumber Co.** on the following basis:

	Lump	Mine-run	Screenings
Kentucky Elkhorn............	$4.89	$4.59	$3.95
Kentucky screenings	4.89	4.59	3.95
Youghiogheny screenings......	4.54	4.24	3.64

Address Village Clk. C. W. Extrum, Keewatin, Minn.

+No. 1017—Mobile, Ala.—This contract (p. 77), which provides for furnishing a year's supply of coal to be delivered at the Spring Hill and Bienville Pumping Stations, has been awarded to the **Imperial Coal & Coke Co.** at $2.95 per ton delivered at the stations. The contract will be filled on washed screened nut, ¾x3½ in. with a guaranteed B.t.u. value of 15,050 and a maximum ash content of 1¾%. Address Supt. C. W. Joost, Mobile Water Works, Mobile, Ala.

+1027—Rapids City, S. D.—This contract (p. 115), which provides for furnishing the Independent School District with approximately 200 tons of coal has been awarded to **Thomas Roush.** The complete list of bids and prices were as follows:

Bidder	Coal	Lump	Egg	Nut
Rapids City Fuel Co.....	Sheridan	$4.40	$4.15	$3.65
Thomas Roush	Poposia	4.25	4.00	3.65
Mid West L. & C. Co.....	Kooi	4.25	4.00	

*Bids on Colorado coal ran from $6.75 to $7.25 per ton. Address Secy. W. F. Haafke, Ind. School District, Rapids City, S. D.

+1066—Pella, Iowa—This contract (pp. 116, 198), which provides for furnishing the local city electric light plant with lump, mine-run and steam coal has been awarded to the **Pella Coal Co.,** on the following basis: Lump, $2.93; mine-run, $2.75; steam, $1.65. Address City Clk. A. C. Kuyper, Pella, Iowa.

+1067—Springfield, Ohio—This contract (p. 117), which provides for furnishing the County Commissioners with approximately 800 tons of coal, has been awarded to **Chas. E. Grube Co.,** 400 tons for the County Infirmary, at $2 per ton, and **Beckmley & Myers**, 400 tons for the Donnelsville Station, at $2.55 per ton. Address County Audr. J. M. Pierce, Springfield, Ohio.

+1069—Olivia, Minn.—This contract (p. 117), which provides for furnishing the local Board of Education with 100 tons of Youghiogheny lump coal was awarded to **William Windhorst**, the lowest bidder at $5.77 per ton. Address, Secy. Geo. E. Peterson, Bd. of Edu., Olivia, Minn.

+No. 1072—Wadena, Minn.—This contract (p. 117), which provides for furnishing the City Government with approximately 1000 tons of Youghiogheny mine-run coal, has been divided equally among the Denver Lumber Co., the Ebner Milling Co., and the Gnest Lumber Co., all of whom bid $3.10 per ton. The Monarch Elevator Co. bid $3.02 per ton, but the bid was rejected. Address Village Rec. A. C. Murray, Wadena, Minn.

+1073—Bridgeport, Conn.—This contract (p. 117), which provides for furnishing the City Department with approximately 500 tons of bituminous coal has been awarded to **Vincent Bros.**, of this place, at $3.74 per gross ton. This compares with $3.80 per ton last year. Address, City Clerk, Bridgeport, Conn.

1074—Buffalo, N. Y.—This contract (p. 117), which provides for furnishing the local Light House Department with coal, has been awarded to the **Ashtabula Steamship Co.**, of Buffalo, at $2.80 per ton for bituminous coal. Address Lighthouse Inspector Roscoe House, Buffalo, N. Y.

+1075—Louisville, Ky.—This contract (p. 117), which provides for furnishing the Louisville Industrial School of Reform with approximately 1000 tons of coal has been awarded to the **James & Dugan Coal Co.** on Harlan Co., Ky., nut at $2.65 per short ton. Address Secy. C. F. Leathers, Louisville Ind. School of Reform, Louisville, Ky.

+1078—Ionia, Mich.—This contract (p. 117), which provides for furnishing the Ionia State Hospital with approximately 2500 tons of bituminous nut, pea and slack coal has been awarded to **E. J. Corbett** at $2.48 per ton. This is the same party who had the contract during the past year. Address Medical Supt. Dr. R. H. Haskell, Ionia State Hospital, Ionia, Mich.

1082—Sioux Falls, S. D.—This contract (p. 117), which provides for furnishing about 1000 tons of coal, has been awarded to **H. T. Parmley**, of this place, on Elkhorn, Ky., coal at $5.10 per ton for screenings and $5.75 for mine-run. Address City Audr. Walter C. Leyse, Sioux Falls, S. D.

+1083—Richmond, Ind.—This contract (p. 117), which provides for furnishing the Wayne County Commissioners with coal, has been awarded to the following companies: **A. Harsh Coal Co.**, $3.05; **H. C. Bullerdick & Son**, $3.33; **Hackman & Klefoth**, $3.35; **Mather Bros. Co.**, $3.05. Address Audr. L. S. Bowman, County Comrs., Richmond, Ind.

+1084—New Lexington, Ohio—This contract (p. 117), which provides for furnishing the Board of Education with coal, has been awarded to **J. M. McCullough**, at $2.85 for lump coal. Delmar Spring bid $2.87½, and M. R. Hearing, $3.25 per ton. Address Clk. C. O. Ferguson, Bd. of Edu., Pleasant Township, New Lexington, Ohio

Contract Notes

York, Penn.—The contract for furnishing the local court house and county jail with coal was awarded to **W. T. Gerber** at $2.95 per ton for Miller vein coal.

Greensburg, Penn.—It is stated here that Pres. Jamison of the Jamison Coal & Coke Co., has closed a large contract for coal to be furnished the French Government.

Dubuque, Iowa—The contract for furnishing the local schools with coal during the ensuing year has been awarded to **Felix G. Becker** and **F. A. Burns**, the lowest bidders.

West Chester, Penn.—The contract for delivery of 300 tons of Lykens Valley pea coal to the Chester County Hospital has been awarded to **John H. Spear & Sons** at $4.54 per gross ton.

Birmingham, Ala.—In addition to previous contracts of this company (No. 598, Vol. 8, pp. 40, 78), the United Fruit Co. is said to have just closed a contract for 40,000 tons with the De Bardeleben Coal Co.

Pere Marquette R.R.—The fuel contract of this road has been let on Island Creek coal, it is understood at 75c. at the mines. The contract was divided among a number of operators in the Island Creek district.

Coke for Export—A commercial representative of a foreign government in Washington, D. C., reports that he is in receipt of requests for the name and addresses of American exporters of coke. Large quantities are desired.

Birmingham, Ala.—Press reports are to the effect that the Georgia Southern & Florida R.R. have closed their contract with the Sloss-Sheffield Steel & Iron Co. for 150,000 tons of coal to be furnished during the ensuing year.

Greenville, Penn.—The contract for furnishing the local schools with coal has been awarded to **N. W. Whitney** at $2.25 for screened lump at bank. The haulage charge will be 74c. Address Secy. I. C. Brown, School Bd., Greenville, Penn.

Walla Walla, Wash.—The contract for furnishing the local Board of Education with 600 tons of coal has been awarded to **Tausick & Kauffman** and **Arthur Thompson.** It is said the contract will be filled on Spring Cannon and Kemmerer grades.

New York, N. Y.—Pattison & Bowns have been awarded a contract for furnishing and delivering 3000 tons of egg coal to the Department of Docks and Ferries at $5.37 per ton. Streat Coal Co. bid $5.94; Gavin-Rowe bid $5.46; and W. P. W. Haff, $5.57.

Portsmouth, Ohio—The Whitaker Glessner Co. at this place consumes about 3000 tons of mine-run coal per year. Deliveries are by railroad at the rate of 60 tons per week. Address Pur. Agt. J. E. Thomas, Whitaker Glessner Co., Portsmouth, Ohio.

Berrien Springs, Mich.—The Emmanuel Missionary College buys their coal in the open market and their requirements for the ensuing year have already been covered. Address Asst. Mgr. Fred Green, Emmanuel Missionary College, Berrien Springs, Mich.

Wyndmoor, Penn.—The Springfield Township School Board has awarded the contract for the delivery of 160 tons of Lehigh stove coal to the schools of Wyndmoor, Whitemarsh, Oreland and Flourtown to **Zebedee Comly**, Flourtown, Penn., at price of $6.22 delivered in the cellars of the buildings.

Kansas City, Mo.—The contract for furnishing the local Water Works with coal, has been awarded to the Central Coal & Coke Co. at $2.20 per ton for mill and $2.05 for slack. The price for slack coal is the same this year as last, but the figure on mill coal represents a reduction of 14c. per ton. About 35,000 tons of coal is used altogether.

Weirton, W. Va.—The Phillips Sheet & Tin Plate Co. at this place consume 100,000 tons of slack, 20,000 tons of three quarter lump, and 5000 tons of mine-run coal per annum. Deliveries are made over the Pennsylvania and Wheeling & Lake Erie, at about the following rate per week: 400 tons of three-quarter; 100 tons of mine-run; 2000 tons of slack. The company has storage capacity for three days. Address Purchasing Agent J. F. Newman, Phillips Sheet & Tin Plate Co., Weirton, W. Va.

Portland, Me.—Randall & McAllister were awarded contract for supplying coal to the City of Portland as follows: Hard coal broken, white ash, $6.85; egg, $7.10; stove, $7.10; nut, $7.35; pea, $5.85. Soft coal: Pocahontas, $4.80; New River, $4.90; Big Vein Georges Creek Cumberland, $5. The other bidder was A. R. Wright Co. as follows: Broken, $6.90; egg and stove, $7.10; nut, $7.40; pea, $5.85; hard coal screenings, $2.25. Bituminous: Pocahontas or Georges Creek Cumberland, $5.10.

Indianapolis, Ind.—The Indianapolis Coal Co. and the Indianapolis Mortar & Fuel company were the only bidders for the contract to supply coal for the ensuing year to the police and fire departments. The former bid $3.25 for mine-run Pocahontas; $4.25 for Pocahontas lump; $3.15 for Kanawha lump and $7.25 for anthracite. The latter bid $3.25 for Pocahontas mine-run; $4.24 for Pocahontas lump; $3.34 for Kanawha lump and $7.24 for anthracite. The Indianapolis Mortar & Fuel Co. secured the contract over the protest of its competitor who insisted that as much more Kanawha was used than the other coals, its bids were the cheapest.

Columbus, Ohio—The contract for 15,000 tons of coal for the Ohio State University for the coming winter has been awarded to the **Lorain Coal & Dock Co.**, of Columbus at $1.19 for West Virginia nut and slack, delivered on the university switch. Other bids were: A. Simons & Son, Columbus, $1.35 for West Virginia nut and slack; Easthill Coal Co., Cincinnati, $1.39 for West Virginia nut and slack; Elk Coal Co., Columbus, $1.42 for West Virginia nut and slack; Halmar Coal Mining Co., Cincinnati, $1.16 for West Virginia nut and slack; Victoria Coal Co., Columbus, $1.15 for Hocking nut and slack; Chesapeake & Ohio Coal Co., Cincinnati, $2.15 for Pocahontas nut and slack and Moreland Coke Co., Cincinnati, $1.34¾ for West Virginia nut and slack. The contract was awarded to the Lorain Coal & Dock Co. because of a better analysis and will be shipped from the newly opened Logan County field. The university has facilities for the storage of between 1000 and 1200 tons and this will be filled and coal will then come forward at the rate of about three cars daily during the cold months.

COAL AGE

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NEPOTISM

PRESIDENT JAMES of the University of Illinois has very decided views on nepotism, which were made public recently. When he learned that his daughter was engaged to be married to Professor Frazier, who held the position of controller of the University of Illinois, he declared he would be very proud to have the professor for a son-in-law, but that he would have no relative by blood or marriage on the faculty of which he was president.

As it was a case of "the girl or your job," Professor Frazier resigned and immediately secured an important position with a large Chicago mail-order concern.

President James' principle is to be admired, and there is no reason why its application should not to some extent be considered in other industries. Would it not help to increase the efficiency and stability of a coal-mining organization, for instance, by introducing it into the mines, in the operating and sales offices and the important and minor official positions?

Nepotism and "pull" mean pretty much the same thing, and we know of nothing that will kill the ambition of the hard-working and capable individual more quickly than the practice of this evil.

To convey the full meaning of nepotism more emphatically, let us quote President James: "*Nepotism is an unmitigated evil. No man is a fair judge of the abilities or services of his own children or relatives. He is liable to overvalue them, or in his attempt to be just, he may lean backward and do them an injustice.*"

The majority of "Coal Age" readers no doubt will concede that President James' idea is reasonable and broad-minded and will admit that the more general use of his principle in all branches of industry would tend to promote harmony and efficiency to greater and better results.

Ideas and Suggestions

How To Reduce Competition and Thus Avoid Waste

By Frank I. Pearce*

In the mining of coal in this country probably one-third of the bituminous coal and one-half of the anthracite are left in the mine. Better methods of mining have reduced past losses, and there is prospect of further improvement; but it is estimated that since the mining of coal commenced in this country, fully 3,000,000,000 tons of bituminous and 2,000,000,000 tons of anthracite coal have been left in the ground.

This can only be recovered with an increased danger and at an expense which makes its extraction highly improbable. To most people, especially those who are not miners, and to some who are, it is interesting to know why there is so much coal wasted in mining. The cause for this waste is unrestricted competition. The operator, driven to economize, cannot expend the large amount of money needed to assure a more thorough extraction of his coal.

Why Mining Competition Is So Severe

The ruinous competition in the production of coal from which the coal business has suffered in practically all its branches during recent years has made a low cost of production necessary. This has been the cause of much of the waste of our coal resources. The coal business is different from almost any other because the natural mine conditions and the cost of opening and equipping the mines are not always equal. As a result the cost of production is not evenly distributed.

Thus we may have a desirable thickness of coal in one mine and weak roof; or both may be satisfactory, but the mine may have a soft bottom and be subject to squeezes and creeps. In other cases the roof is strong and the bottom hard, but there are impurities, and as a result the coal is not good. On the other hand, the coal may be otherwise satisfactory but too thin for mining. Occasionally, however, we have all the desired advantages—good roof, thick and clean coal, and a hard, level bottom free from water. The result of these varied conditions is that some mines cannot compete with others.

The owners after spending thousands of dollars in opening up, equipping and developing the mine must choose one of three solutions of their difficulties. They can continue, at a loss, to compete with producers who can mine coal cheaply or they can close the mine temporarily and pay out a fixed amount of money each month in keeping up miles of tunnels, etc., or they can close their mine entirely, allowing their property to go to waste. In many instances the last-mentioned policy is the only solution, and it not only results in a large waste of our coal resources but it throws hundreds of men out of employment, causing an unnecessary waste and expense.

If the owner decides to operate at a loss, improvements are kept at a minimum, which practice leads to mine accidents. An operator is apt not to give the employee the protection his hazardous employment demands unless there is a fair return on the investment which he has expended on the mine.

The conditions thus outlined are practically identical with those that existed in the coal fields of Australia until the colliery proprietors were able to effect a combination controlling the wholesale price of coal, and distributing the orders.

Conditions Analogous to Those in Australia

Early in the present century the Maitland coal field was opened and it entered into destructive competition with the other New South Wales field which had been operated for about a century. To meet the situation, which was similar to the condition now existing in Indiana, a combination was effected early in 1906 through two contracts, called the vend and shipping agreements. The first of these was a contract between the colliery owners which provided for the fixing of uniform wholesale prices for all coal taken from the field and for dividing the total output among the members in certain proportions and for limiting the output of various collieries to the allotted proportion.

The shipping agreement, supplementing the vend agreement, was a contract between the shipping companies and the collieries. It made the former the selling agents of the collieries for interstate trade, with exclusive agreements on each side and with certain price-limiting provisions. An attempt was eventually made to break up the combination on the ground that as the contracts in question were clearly in restraint of trade, and so unenforceable at common law, an intention to injure the public must be inferred. The court refused to adopt this position, which was urged by the attorney-general, and it pointed to the recognized economic advantages of certain agreements in restraint of trade, especially those of trade unions.

Consumer Is Interested in Fair Prices

The court in delivering its judgment said:

> It can never be in the interest of the consumers that any article of consumption should cease to be produced and distributed, as it certainly should be unless those engaged in its production or distribution obtain a fair remuneration for the capital expended and the labor employed. There can be no doubt that the vend agreement was intended to preclude competition among its members, and by this means to raise and maintain the price of coal.
>
> Low prices are of advantage to the consuming public and their Lordships will assume that in default of anything to indicate that the prevailing prices were too low to afford the colliery proprietors a reasonable profit, having regard to the capital embarked and the risk involved in their trade, a combination to raise prices would, from the standpoint of the public, require some justification.
>
> In the present case, however, it was proved that the prices prevailing when negotiations for this agreement commenced were disastrously low owing to the "cut-throat" competition which had prevailed for some time. It can never, in their Lordships' opinion, be of real benefit to the consumers of coal that the colliery proprietors should carry on their business at a loss or that any profit they make should depend on the miners' wages being reduced to a minimum.

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*Deputy inspector, Department of Mines and Mining, State Capitol, Indianapolis, Ind.

> Where these conditions prevail the less remunerative collieries will be closed down, there will be great loss of capital, miners will be thrown out of employment, less coal will be produced, and prices will consequently rise until it becomes possible to reopen the closed collieries or open new seams. The consumers of coal will lose in the long run if the colliery proprietors do not make fair profits or miners do not receive fair wages. To prove an intention to injure the public by raising prices, the intention to charge excessive or unreasonable prices must be apparent.

This decision of the court certainly is one that is applicable to the conditions at hand. No business, and more especially the coal business, which is so hazardous, should be conducted at a loss. In 1910 there were 182 mines in operation in Indiana employing 21,171 persons, whereas at the present time there are only 126 mines working, and these employ on an average 20,518 persons. The conditions of the coal business have become so deplorable that they have repeatedly driven coal-mine operators into bankruptcy, wasted our coal resources, destroyed life and property and rendered idle each year hundreds of mine employees. The situation, at last, has become intolerable.

The coal operators of Indiana, together with those of Illinois, through absolute necessity have at last been forced to seek some relief. Several meetings have been held in Indiana to consider what can be done to alleviate the present deplorable conditions in the coal trade. They deserve to succeed, and will, if they are successful in getting all the facts before the public. The Federal Government, and the state government also, should recognize the evils of overproduction and the dangers of unregulated competition.

Alcohol as a Motor Fuel

By Leonard K. Hirshberg*

In the light of recent fuel conditions throughout the world as a result of the war, alcohol as a marine, automobile and stationary-engine fuel has come into larger consideration than ever. It even makes growing vegetation, potatoes, cereals and other plants aids to the users of the internal-combustion engine.

In the manufacture of alcohol, all of the materials used are obtained by the plants from the air, and nitrogenous things withdrawn from the soil are thus ultimately returned to the ground and the atmosphere as fertilizer. In a word, alcohol is the transformer of energy. It transmits the energy of Old Sol from the plant to the engine and then back again to the soil for the plant.

Vegetation is the human agency of heat, electric power, fuel, and energy in general. If you consider that alcohol comes from plants; that the heat value of the gallon of alcohol is only six-tenths that of an equivalent quantity of gasoline; that the alcohol yields more and better work, it will be seen that a little difference in price is all that is needed to make alcohol the fuel. The war has no doubt brought this about already in Europe.

The efficiency of the alcohol is greater, although its heat value is slightly below that of gasoline.

One bushel of white potatoes yields 5¼ lb. or eight-tenths of 1 gal. of absolute alcohol. One bushel of sweet potatoes yields nearly 7 lb. or over 1 gal. of absolute alcohol. One bushel of corn gives 16.53 lb. or 2½ gal. of absolute alcohol. Rye yields almost the same. In Germany at present corn, rye and potatoes are being utilized successfully to make alcohol fuel for motor boats, warships, motor cars, engines and the like. Potatoes are perhaps more generally used over there. Whereas the average yield in this country is only 45 to 50 bu. to the acre, they average over 400 bushels to the acre in Germany. Germany made nearly 50 million gallons of alcohol for fuel purposes just before the war and she has doubled this since, practically all from her marvelous potato crops.

While alcohol is four times the price of gasoline per gallon, there is little likelihood of troubling farmers and distillers with its prospects. When, however, gasoline soars to 40c. and more, alcohol becomes a triumphant competitor and wins the day.

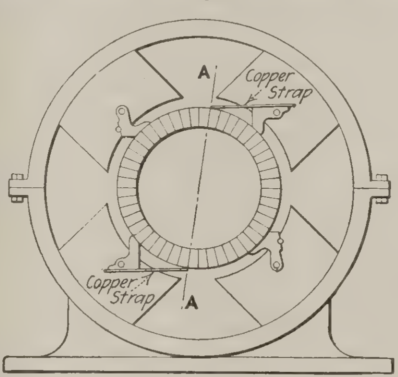
Alcohol, however, is to be made much more cheaply hereafter. It can be made from peat and be sold as low as 5c. per gallon.

One authority estimates that billions of gallons of this 5c. alcohol can be obtained from one small bed of peat in a swampy district of Virginia. At 5c. a gallon for absolute alcohol, you are paying the equivalent of $2 a ton for the best coal on the basis of the best steam-power efficiency.

These peat beds alone will yield enough alcohol to replace as fuel, for at least four years, all the oil and coal now burned to drive heat engines in the United States. It is the belief of some engineers that before many years have passed a practical method will be developed whereby alcohol will be obtained from vegetation.

How To Revive a Dynamo

It sometimes happens in a power station when starting up a dynamo that it will not build up its voltage, and shifting the brushes to the limit of the slot in the holder yoke does not bring the desired result. When this is the case, using a current from an outside source, either from a generator or battery, will remedy the trouble. Current must be made to flow around the fields. It is most important, however, that this current flow should be in the same direction as that of the current of the armature. If this is wrong in the first trial, it is only necessary to reverse the connection.



OUTLINE OF DYNAMO, SHOWING APPLICATION OF COPPER STRIPS

Should no outside source of current be at hand and the generator must be started in a hurry, it may be well to strike the metal of the fields with a hammer in a gentle way. Dynamos have been started to generating by this means. But should this also prove unsuccessful, the next expedient is to get two pieces of thin, flat copper about ¼ in. wide and have a man hold these strips across the brush-holder studs, allowing the points to touch the commutator just past the line *AA* in the accompanying sketch. It will be found when this is done that the machine will start to build up and increase in voltage very rapidly.

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*Baltimore, Md.

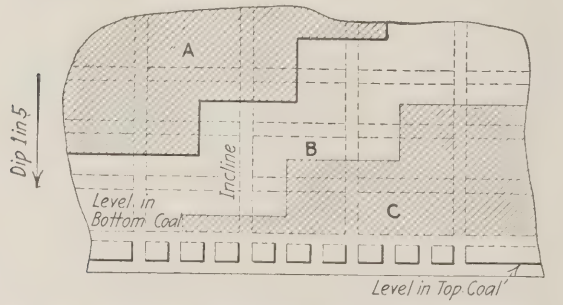
Working Seams That Occur Close Together

SYNOPSIS—Numerous problems arise in connection with the development of coal beds that occur close together. Several methods of mining under difficulties of this kind are here described in detail.

The following is a description of a method of working coal seams as practiced at Patna, Ayrshire, Scotland, in a colliery of the Dalmellington Iron Co.

The coals are sought on the threefold longwall principle. The slate between the seams is found to vary widely in thickness, and this necessitates various modifications of the system of working. When the section is in proper shape for a successful threefold working, the parting between the bottom and middle and middle and top coals is about 3 ft. thick. In each case this gives sufficient débris to build the walls, but not sufficient to prevent the strata from settling down gradually.

The main levels are driven either in the top or bottom coals, preferably the bottom, as this seam has a good roof and floor. The branch roads, 36 ft. apart and 12 ft. wide, are driven direct to the rise of the seam, the gradient being 1 in 5, and are cut off at 300-ft. intervals by cross-levels driven from the heading. If these branch roads have been packed and built with a 3-ft. brushing, in 12 months' time the packwalls will be crushed into the roadway, and the gob will allow the mid coal to settle down in the original position of the bottom coal.

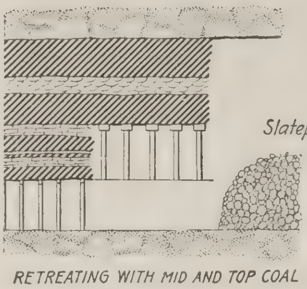


PLAN SHOWING METHOD OF DEVELOPMENT

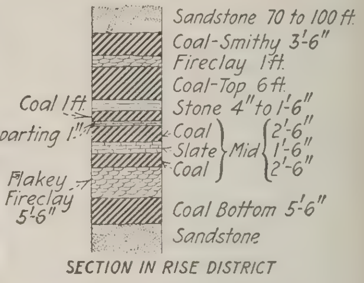
Working the Middle Coal

The mid coal is now ready to be worked. It is the softest of the three, and if allowed to stand for a longer period than the time mentioned, it is likely to be crushed to a powdered state. The same roads are again followed, as was the case in the first working, and these are ripped up to the bottom of the top coal. When the cross-level is reached, a stoop (pillar) is left for its protection; then the top coal is opened out and brought home. Pillars of old timber or rock are built behind to allow the roof of the waste to come down slowly. During the first and second working, the coal forming the roof often creeps down so quickly that it may have to be ripped to allow height for the mine cars, but as it is coal, no extra expense is incurred.

Many years ago these beds in a neighboring mine gave a great deal of trouble from spontaneous combustion and had to be abandoned. To guard against this danger, the levels in the colliery here referred to are driven in the low coal 9 ft. wide, with large pillars on each side, and advantage is taken of strips of whin and "burnt" coal running parallel to the dip and rise to form natural barriers, so as to divide the workings into panels that may be isolated in case of fire.



SKETCH SHOWING RETREATING METHOD OF MINING

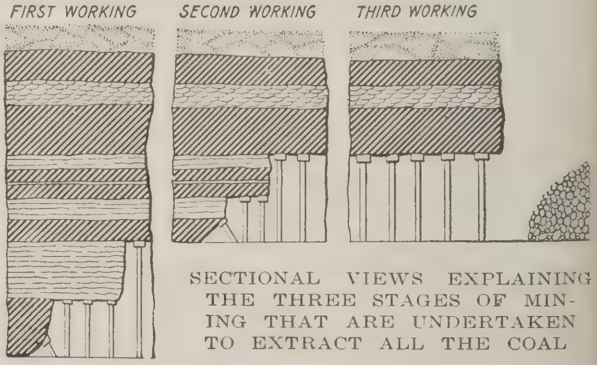


SECTION THROUGH THE STRATA OF COAL AND ROCK

As an example of possible changes in the foregoing method of working, due to any alteration of the section, the method of working in an adjacent district may be of interest.

Another Method of Working

In the first working, the fireclay or brushing over the bottom coal packed the walls solid, with the result that the strata came down very little. As it would not have been judicious to have left the upper coal under pressure for a longer period waiting for the strata to come down, the mid coal was opened out at the bottom of the old roads on a bench 8 ft. above the rail level. The removal of this mid coal to its full height meant a working over 12 ft. high on the road-head, and as the slate in the center of the coal was 12 in. in thickness, it was decided to work the bottom portion of the coal and build the packs with the 18 in. of slate, and then to bring back the upper portion of the mid coal with the top coal.



SECTIONAL VIEWS EXPLAINING THE THREE STAGES OF MINING THAT ARE UNDERTAKEN TO EXTRACT ALL THE COAL

A few places were tried in this way, but the method was not successful, as the packwalls on the top of the bench, and the bench itself, were inclined to slide over into the roadway. This was exceedingly dangerous and caved the road behind the men at the face.

Another district with a somewhat similar section was opened out, and another system adopted with more success.

After the first working had reached a large upthrow fault, the mid coal was opened out on the top of the bottom coal brushing and taken out 20 or 30 ft. down the road. The back props were then drawn to within 6 or 8 ft. of the face, which permitted the top and smithy coal to fall from the rock. After this fall had taken place, the men would climb up onto the top of it and sound the rock, which was very hard and strong. They would then take down any loose coal hanging on the face (ladders and long-handled picks being provided for this purpose), after which they would proceed to load the fallen coal.

A face 150 ft. long could be brought back in this way with little or no loss of coal. When the coal was all cleared away, the height of the working would measure about 30 ft. to the rock roof. This was a twofold working.

Hauling the Coal

The cars being of small capacity were easily manipulated. The loads were generally brought from the coal face by the men. The gradient being 1 in 5, it was quite impossible for the miners to push their empty cars to the face or let the loads down by hand. The method employed to overcome this trouble was a plan often used in mines where the gradient is steep: A good-sized prop (6 to 8 in. diameter) was placed at the face, a hole was then bored through the prop and a small chain-wheel attached. Next the miner passed a 3/8-in. chain around the wheel, one end being attached to the loaded car and the other end to the empty car. The loaded car going downhill hauls up the empty car. If a single line of rail is used, it becomes necessary to provide a place to throw the empty car over on its side, to allow the loaded car to pass. Where the roadways are wide, there is no difficulty experienced in doing this.

In some mines there are in use iron carriages which balance the loaded car. The rails used for these are sometimes lighter than the car rails. The loaded car is thus let down to a lower level, where a sidetrack is provided, which usually is the end of the main haulage.

One of the men pushes the loaded car after it leaves the chain. The other man takes the empty car to the face. The man who takes the loaded car to the sidetrack is called the "drawer." This system gives entire satisfaction and has been in use for a number of years in this and other collieries.

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Extracts from a Superintendent's Diary

There is only one man who comes to our camp in an official capacity whose decisions I dare not question and whose recommendations must be carried out to the letter, whether they have my approval or not. He is the boiler inspector in the employ of the insurance company that carries the liability insurance on our boilers.

Were he to condemn one-half of our boilers and insist that we put them out of commission immediately and keep them out until certain repairs could be made, I would follow his instructions implicitly even though it might require a shutdown of all our operations for a week. Personally I might question the necessity of such extreme action, but if I could not outtalk him and he should insist on putting down his recommendations in writing, no earthly power could induce me to ignore his instructions.

He realizes this as well as I do, and as a result he keeps in mind a factor of safety of about 25 (figuratively speaking, of course) in passing on our boilers, and thereby lightens his labors considerably and relieves himself of practically all responsibility. It usually takes me about two days, following one of his inspections, to get my dignity adjusted.

To-day, however, I had a new experience, and as a result I have about decided that Beelzebub had no part in giving boiler inspectors their power.

An inspector spent last night finishing up his regular monthly inspection of our boiler plant, and early this morning he dropped in for a few moments to notify us as to what he intends to require of us.

Shortly after he had gone a disciple of "syndicalism" came into my office in search of work.

Probably if I had known that the applicant for work considered himself a "syndicalist" I should have dismissed him promptly, but as I had no reason to suspect his philosophy of life and as he made a favorable appearance, I granted him the customary interview, inquiring into his experience to see if we might use him in our organization.

I soon found, however, that he did not take kindly to personal questions, so I told him that we had nothing to offer him.

He was evidently not pleased with my manner toward him, so he opened up and expressed himself rather candidly before leaving.

During the course of his remarks he used this quotation: "Power will intoxicate the best hearts, as wine the strongest heads. No man is wise enough, nor good enough, to be trusted with unlimited power."

That thought recalled the boiler inspector to my mind at once, and the more I pondered over it the more I marveled at its truthfulness.

But the "syndicalist" was not interested in boiler inspectors; he had coal-mine superintendents in mind, and he insisted on telling me how small some of them appeared when judged by the quotation.

He made me realize all right that some of the men in my employ have justification for the same feeling toward me that I entertain for the boiler inspector, and he brought it home to me with a bang.

I was not foolish enough to let the agitator know that he had hit a bullseye or even that he had made an impression, but it will be many a long day before I recover entirely from the shock which he administered to my viewpoint.

And I know that in future whenever I feel like saying things to or about the boiler inspector I will first look about to see if my subordinates have reason to complain about the manifestations of my unlimited power.

⁂

An Important Advantage of Electric Winding, S. A. Simon has informed the Scottish Mining Electrical Engineers, is the steady and even torque produced by the motor, whereby whipping of the rope as caused by the pulsating action of a steam engine is prevented. As a consequence, the rope is less severely stressed, and it is possible to predetermine the stress more accurately, so that higher rates of acceleration and retardation are possible and higher speeds of winding can safely be employed. This applies more particularly when men are hoisted. In Germany, previously when men were being raised, a maximum speed of about 30 ft. per sec. was prescribed. Since the introduction of electric winding, double this speed is permitted, with electrically driven hoists fitted with the usual safety devices.

Use of Air Drilling Machines in Coal Mines

SYNOPSIS—Power-driven drills are now being used for all kinds of drilling work in coal mines from putting in holes for trolley-wire hangers to drilling shotholes in coal, clay and slate and making long holes for prospecting purposes.

The makers of power-driven drills have been many years in fitting them for use in coal mines. The mechanical drill was first invented to work where speed, not cost, was the main consideration; namely, at the Mont Cenis tunnel between Switzerland and Italy. If the work on that tunnel had not been hurried, the interest and running costs would have been prohibitive, and something was wanted which would drill hard rock and drill it quickly. It mattered little if it was a heavy machine for a number of holes had to be drilled at one time and on one line of entry.

Drilling Shotholes in Coal or Slate

But the coal problem is different. The coal can be drilled quite readily by hand, and only a few holes are necessary to shoot it down. So the main need is for an easily transportable drill not needing a truck to move it, which can be handled without a scaffold, a car or a drilling column, and capable of being operated in the narrowest of places or with the operator perched on a ladder. It must be available without any previous preparation for its use, except the connection with a pipe line such as is always in place when an ordinary coal puncher is in use.

And that kind of a drill has been long in appearing. Now that it has come it is quite likely to displace the old hand-drilling outfit, except perhaps where it is possible to sink holes with a breast auger. There is much trouble in drilling a hole in hard or sulphury coal, in slate or in clay. The preliminary sinking of a hole in floor and roof, the bringing up of a heavy extensible drilling post, placing it in position and then drilling, often in cramped quarters, takes much time and involves much labor. The work is by no means simple, even though it is done by hand.

With a 40-lb. Jackhamer drill there are no delays except to bring up the drill, connect it to the airline and hold it to the work. In even sulphury coal it will advance a foot in a minute, and so save time and the hardest kind of labor. The frequent trips to the blacksmith's shop, the broken drills, the uncertainties in coal production, the general discontent which prevails in a camp with hard coal, are all avoided. So little is known about the time expended on the various elements of coal mining that most operators are unable to tell what the items of drilling cost. Drilling certainly is no negligible item anywhere, and in some coals it is one of the most distressing.

T. B. Young states that when he was mine superintendent at Aladdin, Armstrong County, Penn., he found he could drill a 4-ft. hole with a Jackhamer quicker than he could set up a post drill to do the work. One man with a Jackhamer would do more than two men with a post drill.

Those who are using the Jackhamer find, moreover, that it can be used everywhere. It has been found valuable in the sinking of holes for trolley hangers, for which it is not too heavy. But if it is light enough for coal it is nevertheless heavy enough for drilling limestone. One man in lifting bottom in this material averaged 40 ft. per shift and drilled 1½-in. holes. This was at the mine of S. M. Hamilton & Co., at Wellscreek, Penn. Another man working for the Rockhill Iron & Coal Co. says he can bore a 6-ft. hole in solid limestone in 22 min. and can drill a hole of that depth without cleaning.

A Prospect Hole in Rock 30 Ft. Deep

In December of 1914, at the Staunton colliery of the Harleigh-Brookwood Coal Co., near Mahanoy Plane, a tunnel was driven by the Portland Contracting Co., and the contractors desired to know how near they were to some old works and if they contained water. M. C. Reed, in describing the method of exploration, says:

ALL THERE IS TO IT

> Having no prospecting drill we decided to drive the hole with a Jackhamer, using four pieces of steel, 3, 6, 9 and 12 ft. long sharpened to a 2-in. gage. After drilling 12 ft. with this set of steels we welded a bit into a 2-ft. length of 1-in. pipe and a shank into another pipe. Then with extra heavy couplings we connected these to a 10-ft. length of the same size of pipe and drilled the additional 2 ft. without finding the old workings.
>
> Being so successful with this innovation we had the bit resharpened and added another 2-ft. section of pipe and proceeded to drill again. We continued in this maner, resharpening the bit and adding 2-ft. sections of pipe until we found the old workings at a distance of 30 ft.
>
> The hole was drilled through a hard slate formation on about a 6 deg. pitch, and the Jackhamer rotated the steel perfectly until the hole was finished. It would be interesting to know how far we could have drilled, because the way the outfit was working when the hole was finished makes us feel we could have gone several feet further. However the size of the hole would soon have stopped us because of the size of the extra-heavy couplings. The diameter of our bit was about 1⅝ in. when the hole was finished.

Mr. Reed says he is drilling 12-ft. holes every day with the Jackhamer drill and is experiencing no difficulty in so doing. A prospecting drill costing about $750 would have done the work, it is true, but the flexibility of the Jackhamer is most convincingly proved by this work, for which, of course, it was never projected.

Tunnels Driven Only 30-In. Square Section

To show the varied work to which the Jackhamer is adapted that done at Pax, W. Va., and cited by John Lindley, of the New River & Pocahontas Consolidated Coal Co., may be quoted:

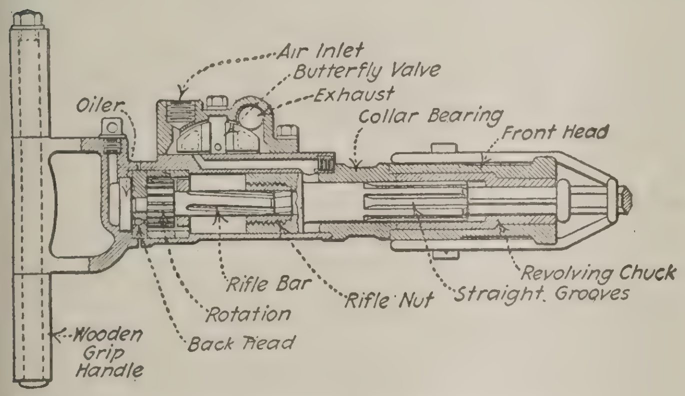
> We have driven 11,460 ft. of narrow entry, including 7868 ft. of 10-ft. entry, 3292 ft. of 12-ft. entry and 300 ft. of 22-ft.

entry. The slate in these roadways ran from 1 ft. to 18 ft. in thickness and averaged about 6 ft. Four overcasts were constructed, three of which have a cross-sectional area of 76 sq.ft. and the fourth of 104 sq.ft.

Two waterway tunnels were driven, each 50 ft. long and 2½ ft. square. Such a small opening could not have been driven with any other drill and is quite unusual, but we desired to drive a tunnel of minimum dimensions. A ditch was constructed 125 ft. long, 18 in. wide and 3 ft. deep and another 50 ft. long and 18. in. deep, also with the help of the Jackhamer. The excavation in solid rock of a pump room 9x12x18 ft. has just been completed with the aid of the same handy tool.

Our shaft is concrete-lined and very wet. We desired to make water rings in the solid concrete to drain the water to the sump by means of pipes. To do this we tapped our air line at the surface and swung a hose line down the shaft. We then took a Jackhamer drill, and working from the cage, drilled holes 4 in. deep in the sides of the walls, sloping downward and as near together as possible. Afterward we smoothed and pointed the work with hand drill and hammer so as to make a continuous ring trough round the shaft.

In this manner we constructed three rings which carry the water to one end of the shaft, from whence it is piped to a reservoir (also made by a Jackhamer) and pumped to another reservoir on the top of the hill. The water being pure it is used for the supply of the camp. Our best drilling with these Jackhamers was one 6-ft. hole in slate in 8 min. and six 6-ft. holes in coal in 24 min. The driller in making these results did not know he was being timed. He said he had drilled a slate hole 6 ft. deep in 5 min. when he was putting forth his best efforts. We are averaging 200 ft. of drilling per shift with two Jackhamers and four men. These men move from place to place and lay their own pipe lines.



THE JACKHAMER IN CROSS-SECTION

It is impossible to tell all the different positions and places in which we have used Jackhamer drills. We worked from small trestles of 2x4-in. lumber built up 6 to 15 ft. above the ground, supports which would have been wholly inadequate for the columns of other makes of drills. Since we started using the drills, the cost of upkeep has been comparatively small, not over $100 including a new set of bits, six extra 12-in. bits and one extra 36-in. bit.

One Hand-Drilled Hole Costs as Much as 43 by Machine

At the Edgewater Mine, Ensley, Ala., the compressor recently broke down and the Jackhamer was put out of commission in consequence. Two men were put to drill a hole by hammer and steel. In three hours it was completed. The combined wages of the men was 50c. per hour, so the hole cost $1.50. As soon as the compressor was running the same amount of work was done in 7 min. with a wage charge of 30c. per hour. So the hole as made by the Jackhamer cost only 3½c. That same Jackhamer ran two years without a cent of repairs.

At a mine in central West Virginia a Jackhamer was used to drive through a "want" where the coal was replaced by white sandstone of an extremely flinty character. The heading measured 6x20 ft. The cost of driving the roadway without the drill was about $40 per yard; with it, it was driven for $22.

At the Black Joe mine in Kentucky, the trolley-wire hanger holes were put in by two men with hammer and steel. In a whole day they put in 9 or 10 holes from 4 to 6 in. deep. One man with the Jackhamer can drill 9 or 10 holes in 10 or 15 min. At the same place a coal hole 5 ft. deep has been driven in 2 min.

R. G. Johnson, of the Dravo Contracting Co., states that largely by the help of three Jackhamers he sunk a 350-ft. shaft and lined it with concrete and put in a steel ladderway. His repair bill on the hammers was only $12.42. In establishing this record during the month of May the shaft was sunk 126 ft. and lined completely.

These drills are made by the Ingersoll-Rand Co., of 11 Broadway, New York City.

*

Sweden Buys German Coke

The importation of coke from Germany, says *Commerce Reports,* during the last few months has been exceptionally good. During May, 1915, 16 ships arrived in Stockholm from German harbors with about 30,000 tons of coke. This great coke import is of course caused by the high prices of coal in England and the freights from there.

Many steamers, especially the smaller ones, as well as the state and private railways, are now using coke—either alone or mixed with coal or wood—as fuel, apparently with good results, as the import of coke continually increases.

*

Coal Imported at Limon

The approximate annual amount of coal used in the Port Limon district of Costa Rica is about 50,000 tons, says Consul Chester Donaldson in *Commerce Reports,* practically all being imported from the United States. This coal usually comes in cargoes of about 4000 tons.

The two wharves at Port Limon afford facilities for unloading or loading four to five vessels of 5000 tons register at the same time. The depth of water is 20 to 28 ft. Each ship can discharge 500 tons daily.

The port charges are as follows: Pilotage (not necessary), $14; tonnage, ships 2000 tons or under, $23.26 ($1 for each additional 100 tons, maximum $30); Costa Rican bill of health, $2.79; wharfage, per day, $30; springs, per day, $7 each; buoys, per day, $4.50 each; derricks, per day, $4.50 each.

The only coal imported at the present time is a West Virginia coal imported by the Northern Railway Co.

*

Higher Wages for Welsh Coal Miners

By decision of an official arbitrator, says Consul Lorin A. Lathrop of Cardiff, Wales, in *Commerce Reports,* wages of coal miners in the South Wales coal fields have been advanced. Miners asked 12½ per cent. advance on actual earnings. Owners offered 10 per cent. on standard wages. The arbitrator awarded 17½ per cent. on standard, equal to 11 per cent. on earnings. Hence miners received nearly what they asked. The minimum wage of a skilled collier will henceforth be $11.87 per week. Actual earnings may be taken at double this sum.

The Psychology of Strikes at Coal Mines

By Josiah Keely*

SYNOPSIS—All strikes do not arise from grievances, or otherwise the employees at mines where there is the greatest cause for complaint would strike first. The men with the lowest scale in a district often are the least disposed to strike. The fear of being outlawed as a "scab" binds the contented to the discontented more firmly than their common grievance when they have one.

Perhaps this title may prove more academic than is intended, but it is chosen advisedly in discussing the subject, "Why are Strikes at Coal Mines of Such Frequent Occurrence?" We may well admit that there is an undue tendency to carry all difficult problems into the realm of psychology in order to dodge the burden of proof or to befog something that does not offer an easy solution. However, even after making such an admission we must confess that we do have abundant evidence that a man's attitude toward his job is not always based on material conditions or on any deep and systematic reasoning.

In certain mines we have what we call "inherited" rates, or wages, and the tradition in favor of these is so strong that even in labor-union agreements the old rate is allowed to stand. It is not questioned, because it has been a custom, a precedent. Nearly always some of the "oldest inhabitants" can tell you how that rate was started.

We all know that a "wet rate," though established for a heading producing water, will lose us a miner if the entry becomes dry and the old rate is put in force. Somehow the entryman feels as if he had been cheated if he is not paid for water which no longer annoys him. Again, we have a breakthrough that encounters a fault. The miner quits and no one will take his place. However, start someone on the other side and he may drive through; all we need to do is to get a "running start" at it.

Strikes Are Instituted Both in Mines Having Liberal and Illiberal Conditions

In a certain district, where payment was made by the car, it was many years before the cars at all mines were brought to a standard size. All the men in that region could tell you just which mines had the larger cars, yet all accepted without complaint the working conditions in force at each mine, because everybody else assented to them. All changes except a flat increase in rate are looked upon with disfavor.

Similarly two mines, working side by side and paying their men by the carload, may demand that the car be topped to a different level without a complaint being made by those miners who have always been required to build their cars to a greater height above the side boards. If it has been a custom to load in a certain way, the merits of the system are not subjected to criticism.

It is notorious how workmen will follow a recognized practice. Thousands of dollars have been lost in attempting to install new devices and new types of machinery around mines, not because there was anything wrong with the improvement, but because it entailed a change of custom or habit. When steel ties are well established, the men will have nothing else. Where wood ties are in use, some system of compulsion must be employed if steel ties are to be introduced. Nor is this a reflection only on the intelligence of the average miner, for this same "conservatism" often extends to the manager himself.

Now if we had not invoked "psychology" to help us out with this problem, the casual reasoner might at this point argue that these citations only prove that the miner is a contented being and disposed to endure much injustice rather than complain of his lot, but fortunately, or unfortunately, depending on your point of view, the man who uses little reason in one case, seems just as incapable of making reasonable demands in another. In other words, prejudices that have not been reasoned in, cannot be reasoned out. When once he has awakened to the new idea of getting more, or working less, no definite limits suggest themselves. This is the phenomenon which the average operator hastily sums up by saying of the mine workers, "They don't know what they want."

It would make an interesting analysis to tabulate how a man acts when alone, how he acts when with a companion, when with two, with three, or with a crowd. It is curious how our thoughts and actions are reflections of what we think is expected of us and how when we leave the conventions accepted as the proper order we lose the proportion of things. Everyone of us is acting for an audience, and the typical "bad actor" is a clear evidence that part of his audience is bad.

Much of the Trouble Is Not Spontaneous, but Hatched

In labor troubles there is much playing to an audience—the operators to other operators and the men to other men. People have always fought as strongly for a sentiment as for material advantage. In the mead halls of the Anglo-Saxons our ancestors made their boasts, and woe to the reputation of him who could not perform his oath.

It has pleased some of the contributors to *Coal Age* to represent that the labor troubles are the result of a yearning after better conditions; and the houses, the commissaries and the systems of measure have been dragged into the discussion. Also, the right to form labor unions has been presented for consideration. Of course strikes will not cease when operators oppose confederation, for though we have some strikes without unions, we have more with them. And the unions are not so harmless that the operators are wrong in opposing them, for the conduct of these much-vaunted associations ranges all the way from organizing for mutual improvement to engaging in Black Hand practices.

Not forgetting that we are all actors, the union local furnishes the best opportunity for an audience and the actions of each man may there be reviewed. Strikes occur in unorganized as well as in union fields, but this is just a paradoxical way of putting the statement, for there can be no strike without some kind of organization. You may term the confederation a union or not, as you please, but in any case a few will be striking for some supposed gain or grievance while the rest will be acting and merely bidding for the approval of neighbors and neighbors' sons and daughters.

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*General manager, Cabin Creek Consolidated Coal Co., Kayford, W. Va.

I do not know which was invented first, the word "strike" or the word "scab," but the whole psychology of strikes revolves around that expressive epithet, the deepest curse of the striker. It can be pronounced with the same hiss as "scathe," "scald," "scorch," and it burns deep.

Discontent Is a Matter of Education

The "sturdy son of the soil" first had to be educated to the proposition that he was downtrodden. This was accomplished by politics; but political appeals to the people are not new. The wonderful development of transportation and the long-distance news service have served to multiply the influence of a single restless spirit a thousand-fold. The news that the laborer must get his "rights" has flown like a pestilence to the ends of the earth, and the echo has reverberated until we cannot now distinguish sound from echo. It is in the air.

One must be an optimist indeed to predict any speedy adjustment to the conditions which make strikes possible. There is a nice distinction between a strike and a rebellion, but there is also an analogy. The element of oppression is supposed to exist in both, but a successful strike does not attain to the dignity of a revolution. There was a time when much was said about contentment with one's station in life, but there seems to be rebellion against having such a station. No one listens with complacency to the statement that stars differ in magnitude and that angels differ in glory. The wealthy man's automobile is a red rag, and his brownstone front engenders the cry, "On to the Bastile."

At a recent investigation into a strike, a senator from New Jersey asked a Catholic bishop from West Virginia what he thought brought about the feeling of the miners against the operators, and he answered gravely that "the fine homes on Front Street in Charleston had a lot to do with it."

We have an army of wealthy people in this country who, having "got theirs," attempt to do penance for their questionable methods of getting it by administering first aid to labor. It satisfies the human craving for popular applause without selling all their goods to give to the poor. They are the Industrial Loafers of the World.

It is necessary to touch all these seemingly irrelevant matters in order to establish a psychology for strikes, and it will not be out of place to mention that we still have quite a few operators who, having convinced themselves that miners are unreasonable, work on the theory that it is just as easy to "get by" with a "raw deal" as to work for coöperation.

Strikes Violating Contracts Are Inexplicable

Before going any further it might be well here to give some concrete examples of strikes. Of course there are annual, biennial and triennial strikes to get contracts. We expect and prepare for them; but I take it that the strikes that are the most frequent and annoying are the "hold ups" when the miners throw down their tools after they have agreed that they will not strike. At a certain mine working under an agreement to take up all matters by arbitration and to suspend work under no circumstances, a young man was questioned by the superintendent about a pump that he had maliciously broken.

The employee added to the offense by becoming impudent to the superintendent and was discharged. Now the contract specifically stated that the right of discharge should not be questioned. The matter was taken up by the local union and a strike called. The management, hoping to establish cordial relations with the men, waived the company's rights in the matter and reinstated the young man conditionally. Another strike was soon after narrowly averted because the pump was not also as speedily reinstated.

Another mine was losing about 300 tons per month at the scales. The cars were reweighed in the presence of a committee, and it was found that the tare weight had to be reduced 70 lb. and that the company had been losing just that much on every car weighed. As the weighman was not eligible to the union, was supposed to look after the company's interests in weighing, and had permitted the loss, he was replaced. The miners struck and would neither appoint a checkweighman nor allow the man whom the company appointed to weigh their cars.

Another mine had a bad condition which could not be covered by the scale. This section was being worked by contract after being refused at the scale price. The miners struck to have the work operated under the scale. Knowing that the real trouble was the objection to contracting, the management gave the contractor another job and offered the contract to the president and secretary of the local union. They accepted and there was no more "local" at that place.

At a mine striving for a better output and not showing any improvement, it was found that the motormen had virtually agreed to haul just so many trips per day. Instead of discharging them, they were given the benefit of the doubt and changed to other work. A strike followed, and an adjustment was made only when a counter-charge of dishonest checking-off by the checkweighman was dropped. There was a suspicion that this charge had been brought in order to use it as a compromise, but that is not a matter of psychology.

I regret that I cannot cite some example of a strike to remedy something "real raw" done by the company, for I suppose there are examples. Oh yes, I do recall one: A company was furnishing explosives to its miners and decided that it was a bad practice, which it was. The company ordered that it be discontinued and a new price be placed on the car, and the additional price was not enough by about one cent to cover the cost of explosives.

How "Bushwhacking" Is Introduced to Nurture the Union

Now there is a phase of strikes which, if noted, would swell the number to unknown proportions. It is what is known as "bushwhacking." After a bloody attempt to organize a new field on the closed-shop basis, the U. M. W. of A. made a contract by which the union was recognized, but under which nonunion men might still work. By a system of stealing and breaking up tools and throwing rocks against houses at night, the nonunion men were induced either to leave the region or enter the union.

The agreement also provided rates for future work with allowances for "inherited" rates. When a nearby mine had some pillars to start the men began bushwhacking for the inherited rate of another mine, instead of the agreed regular rate. No one could be found to work the pillars. Finally work got so scarce and the pillars were so desirable that some bolder spirits undertook to work them. In a few days they found their needles twisted around the posts, their axes ruined and the handles hacked out of their shovels.

These instances can be multiplied and are of almost daily occurrence, but we started to build the psychology of strikes around the word "scab." This word stands for the mental attitude back of all strikes. A traitor is bad enough, but a scab is a denegrate traitor and worthy of a thousand deaths. The scab always leaves a cicatrix. Once a scab always a scab. To the miner this stigma carries all the terrors of excommunication. To avoid any possible danger of this curse, the average miner will not only strike, but do violence to convince the doubters.

It is not necessary to drag into the subject the stock-in-trade inconveniences in a coal camp—the living conditions. A group of camps often includes some where living conditions are better than others, yet the striking and bushwhacking does not follow the squalid conditions. As a matter of fact, the agitator usually succeeds in getting the best house and the best place in the mine.

It is not necessary to be a traitor to be a scab. Strikes occur with frequency because it is so easy for a man to be denounced as if he were one. In some camps he can earn that cheerful title from any one of a hundred acts, ranging from speaking pleasantly to the boss to taking a man's job when he is discharged. But there is one deadline beyond which no miner can pass and escape excommunication—that is, to work when the strike is called. That is the real reason why a strike is so easily started. It requires no further advertising than the word of two or three leaders. It is true that there is often much mummery of voting, etc., but the real deterrent is the cold fear of the word "scab." The miner's life is not a full life; each plays to his limited audience, and the hiss of the audience means social death.

NEVERTHELESS IT IS NOT WELL TO BE REACTIONARY

Of course we must continue the good work of bettering working conditions and the striving for a more cordial relation between company and men and the other refinements of operating, but these great waves of popular discontent come on like a squeeze in a mine, and for the same cause—things have been worked on the wrong system until the movement gets started.

There is probably little real injustice done the miner by the operator today. In fact, labor seems to be getting more out of the investment than capital is, yet perhaps in years past, during the rapid development of coal, some inequalities existed that furnished seed for the agitator and the politician. The demand for labor made it easy cultivating, and we will be fortunate if it does not prove a crop of dragon's teeth.

The miner needs our sympathy, for where he may have been whipped with the whips of the operator, he is now chastised with the scorpions of a newer and greater bondage. The order of society is reversed, and instead of the sacrifice of the few to the comforts of the many, the miners are attempting to get revenge for supposed or real individual grievances by making the majority of their number suffer from strikes. Until they confine themselves to working for the cause instead of using the strike as a weapon to thwart mine discipline in individual cases, it seems likely that the frequency of petty strikes cannot be avoided.

There is too much evidence that they are trying to abolish penalties. The attitude is that no one shall be held accountable for his acts save to the miners themselves, and the only penalties they seem willing to exact are those for "scabbing." It is too artificial to be a stable condition. The situation will have to get better or grow worse.

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New Coal-Washing Plant

Plans for a new coal-washing plant to be erected on the campus of the University of Washington have been drawn up and submitted to the board of regents by Dean Milnor Roberts of the college of mines. Besides demonstrating coal-washing methods and machinery, the equipment and laboratory will be suitable for making carload tests for the coal operators of the state. Washing is one of the big problems of the coal industry in Washington, which business at present yields $8,500,000, leading all other mineral products of the state.

Some of the coals of Alaska also will be washed to prepare them for market or as a preliminary operation to coking. All other tests on coals, such as analyses, calorimeter tests and steam-boiler tests on carload lots, can be made with equipment now used in the college of mines.

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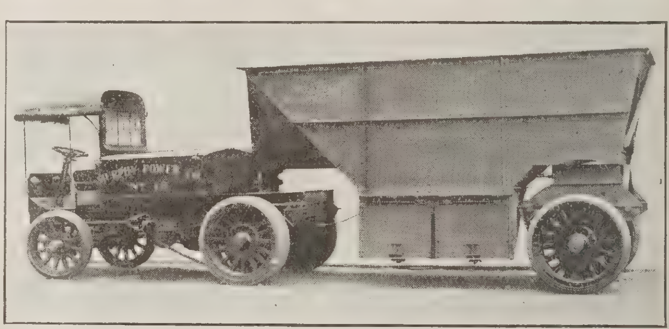
An Electric Tractor and Trailer for Handling Coal

By Frank C. Perkins

The accompanying illustration shows a large electric tractor and trailer, designed at Detroit, Mich., for the purpose of transporting fuel from coal yards to an electric-power plant. It may be stated that this trailer is capable of carrying 12 tons of coal. It is loaded in the coal yards from a hopper, so that the time for loading and unloading is about 8 min. One round trip is made hourly, and two or three carloads can be handled per day. The labor for transferring this coal is reduced to a minimum as but one man is necessary for all the work.



THE NEW DETROIT ELECTRIC TRAILER

It is of interest to note that the tractor has a 100-in. wheelbase and is of standard truck construction except that the batteries are carried above instead of being underslung. This makes them easily accessible, and also affords the proper weight over the traction wheels. The tractor is fitted with 60 cells of Edison battery and has plenty of capacity for this work.

It is held by the owners that by using this car there has been effected a saving of from 12c. to 15c. per ton over the horse-drawn method previously used. They figure the operating cost, and include interest on the investment, depreciation, mechanical and electrical upkeep, body repairs and paint, fire insurance and taxes, driver's wages, current for charging and garage expense.

There is no doubt that the electric truck can be used to great advantage and with high economy, the batteries being charged during the low-load periods of the day.

Wasteful Coke Production

While Germany is carefully conserving her resources by coking her fuel output in byproduct ovens to save the valuable tar, ammonia, gas and benzol, the United States is literally throwing away these useful products to the value of millions of dollars annually by the continued use of the wasteful beehive oven.

In 1914 the total output of coke in the United States, according to the Geological Survey, was 34,555,914 short tons, valued at $88,334,217. Of this 23,335,971 tons was made in beehive ovens, with an almost total loss of the byproducts, and 11,219,943 short tons was produced in byproduct ovens, with a recovery of over $17,500,000 worth of byproducts, or approximately $1.55 for each ton of coke. As there were over 23,000,000 tons of beehive coke made in 1914, and as the yield of coal in coke is less in beehive ovens than in byproduct ovens, the loss of byproducts from coal made into coke in the beehive ovens in 1914 was not less than $40,000,000. The slump in copper and other base metal smelting following the declaration of war in August, 1914, was directly responsible for a marked decrease in the coke production in the Rocky Mountain States.

Compared with 1913 the decrease in coke output was 11,743,616 tons, or 25 per cent. in quantity, and $40,588,056, or 31.5 per cent. in value. The beehive and byproduct coke did not suffer equally in the decrease, the former falling off 10,248,859 tons, or 30.5 per cent. in quantity, and $30,030,371, or 37 per cent. in value, as compared with a decrease in byproduct coke of 1,494,757 tons, or 11.8 per cent. in quantity, and $10,577,685, or 22 per cent. in value.

Three states, Kentucky, Ohio and Washington, showed increases. These increases were all due to the operation of byproduct plants, the building of which was begun in 1912 and 1913. The principal decreases were: Pennsylvania, 8,495,051 tons; West Virginia, 1,044,790 tons; Virginia, 522,619 tons; Indiana, 450,373 tons; Illinois, 434,385 tons, and New York, 301,116 tons.

At the end of 1914 there were 99,755 ovens in the United States, of which 5809 were byproduct ovens and 93,946 were beehive. Of the byproduct ovens 667, or 11.5 per cent., were idle throughout the year, and 44,450, or 47.3 per cent., of the beehive ovens were idle.

At the end of 1914 there were under construction 644 new byproduct ovens and 605 new beehive ovens. During the year 71 byproduct ovens were abandoned, all of which it is expected will be replaced by others of the retort or distillation type, and 3603 beehive ovens were also abandoned.

The following table gives the output in short tons of coke in the United States during 1914, by states:

Alabama	3,084,149	Virginia	780,984
Colorado	666,083	Washington	84,923
Georgia	24,517	West Virginia	1,427,962
Illinois	1,425,168	Maryland	2,222,134
Indiana	2,276,652	Massachusetts	
Kentucky	443,959	Michigan	
New Jersey	255,283	Minnesota	
New Mexico	362,572	Utah	
New York	457,370	Wisconsin	
Ohio	521,638		
Pennsylvania	20,258,393	Total	34,555,914
Tennessee	264,127		

British Regulation of Prices

The newly passed British act limiting prices at the pit mouth, says *Commerce Reports,* is intended to affect domestic supplies, and exports are not within its provisions. Out of the 55,000,000 tons of coal annually produced in the South Wales coal field 37,000,000 tons are shipped abroad in normal times; hence the act will apply to considerably less than half the output. The price of export coal is, however, limited in effect by the license to export required for each cargo. For the six months ending June 30, 1915, the total coal exports from South Wales ports were 10,000,000 tons of 2240 lb. Exports for the first half of 1914 were 14,500,000 tons. This apparent falling off of 50 per cent. is actually much less, for shipments on Admiralty account are not reported.

Nevertheless, refusal of licenses, high freights, shortage of coal and high prices for coal have greatly reduced shipments to Argentina, Brazil, Egypt and neutral European countries.

Ballads of a Coal Miner--V

Written Expressly for Coal Age

The Chance Taker

By Berton Braley

THEY brung up one of the boys today—
  Or what there was left of him—
  A lifeless bundle of broken clay,
A terrible sight an' grim.

I'd seen him when he went down to work,
  A-smilin', an' gay, an' free,
Descendin' into the dusty murk
  With a laugh an' a joke fer me.

An' now he's done, an' his job is through,
  An' his body is lyin' there,
An' he'll look no more on the sky that's blue
  Or walk in the open air.

They told him to timber the roof above,
  But he "guessed it would stay all right,"
An' now he's finished with life, an' love,
  An' pleasure, an' work, an' fight.

He made a gamble with death—an' lost—
  An' life is the bet he paid;
An' wife an' children must bear the cost
  Of the careless game he played.

There's a husband lost an' a father gone,
  An' a good friend dead an' done,
Because of a chance that he *would* take on—
  An' a needless risk he run!

The Labor Situation

SYNOPSIS—The Western Federation of Miners and the United Mine Workers of America will not amalgamate. An improvement in labor conditions may result in Ohio from the general development of the coal business. Strikes have recently been called in other states because of an idle rumor that wages would be lowered and because men formerly employed in a mine now idle are not given employment in one which is still working.

The committee appointed by the United Mine Workers of America at the Indianapolis convention met with another committee appointed by the Western Federation of Miners, and on July 28 decided against amalgamation. The Federation representatives were Dean W. Selfridge, Joseph Gorman and J. B. Rankin; those of the United Mine Workers of America were Frank Farrington, Adam Wilkinson and Robert H. Harlin.

The latter group made a separate pronunciamento supplementing the joint report. This declared that the relations with the Federation were perfectly friendly and that reasons of policy alone prevented union. It further recited in proof of this unquestioned amity that the two labor organizations had for many years exchanged union cards.

Cause for Optimism in Ohio Coal Circles

It is likely that the Ohio situation will soon clear itself, for the marked improvement of business will probably make it possible to reopen many mines now idle and work them at a low margin of profit. This will be regarded as a triumph of the union's contention that the rates are fair, but the trouble will be duplicated all over again as soon as the new scale is signed throughout the rest of the country and business falls back to its normal volume. It is largely the threat of a strike in the spring which is giving tone to the coal trade.

The Public Utilities Commission is expected to be a long time deciding on the rates to be ordered. This body in its previous session on the coal rates cases ended Aug. 6 definitely decided that it would not permit the railroads to offer as a defense the fact that mining conditions and prices of production as between Ohio and outside coal fields are responsible for the present inactivity in the Ohio mines rather than exorbitant freight rates. The railroads were preparing to make this a basis for their defense against a reduction in rates. If it had been admitted, it would have lengthened the sessions, as well as caused a verdict based on improper premises.

In ruling out this evidence Chairman Waltermire declared that the only question before the commission is, "Are freight rates on coal within the state unreasonable and discriminatory?" He declared that side issues would not aid the commission in answering this question.

At the same session the commission permitted Professor Frank A. Ray of the mining-engineer department of the Ohio State University to testify that only 6 per cent. of the available coal supply of Ohio has been mined. He declared that the coal production in the state had steadily increased from 19,500,000 tons in 1900 to 36,000,000 tons in 1913. The amount produced last year was less than 15,000,000, though the same freights were charged by the railroads as in previous years. It was in this manner that an attempt was made to prove that the wage scale was the variable which put Ohio out of the coal market and not the freight rates charged by the railroads.

On the other hand, the commission allowed the miners to put in their testimony a statement of the property valuations submitted last year by the railroads for purposes of taxation, and also to show what the rates were from West Virginia to points on Lake Erie. Even after the commission makes its ruling, distant as that date may be, the case may be taken up to the Federal Supreme Court by the miners if the decision goes against them.

The Dilemma Troubling the Ohio Railroads

The railroads are on the horns of a dilemma. If they state that they cannot haul Ohio coal for lower rates, then it will be argued that they are discriminating against the coal of Ohio by giving West Virginia a rate which is unprofitable to them. If, on the other hand, they say the West Virginia rate is profitable, the Ohio coal mine owners and miners will ask, "Why then charge so much for hauling Ohio coal?"

The coal operators and the union are trying to prove that 2 mills per ton mile is the cost of hauling on the road from Armitage to Toledo, and consequently the profit is 40c. per ton on the whole trip. The railroads put the cost at 3 mills per ton, and Attorney Wilson for the Hocking Valley Ry. declares that the records in the State Tax Commissioner's office prove that this is so.

The Wheeling Creek and Blaine mines of the Lorain Coal & Dock Co., near Bellaire, Ohio, have resumed work. The former has been idle for 19 months, and the latter has been twice on strike within 30 days. The first trouble in the Blaine mine, it will be remembered, was about the installation of mine-run scales, while the more recent disagreement was about the checkweighman.

The Marietta Chamber of Commerce has shipped a carload of cabbage to the idle miners at Glouster. The cabbage was donated by Muskingum Valley farmers. Typhoid has broken out among the miners in that town.

An attempt is being made to increase the amount of Ohio coal sold in Ohio, the state consuming 60,000,000 tons a year and producing only 37,000,000. It is said that the Ohio State University, of Columbus, rejected Bailey Run coal because West Virginia coal could be bought for 7c. a ton cheaper. If the Ohio coal had received the preference, the Bailey Run mine might have been run 30 days longer. The contract is for 15,000 tons, and the Governor is endeavoring to find out if the contract is irrevocable.

A Strike in West Virginia in the Panhandle District

Just across the Ohio River from Bellaire, Ohio, near Moundsville, Marshall County, W. Va., a small strike involving 80 men arose from an idle rumor that M. J. McQuade, who at the time of the calling of the strike was in Pennsylvania, had determined to reduce wages and had so announced to one of the miners. The plant is owned by the Ben Franklin Coal Co., and most of the coal is used at the Riverside mine of the National Tube Co.

It was alleged that the loading rate was to be cut from 46¾ to 43c., and the undercutting rate from 12½ to 11c. On Mr. McQuade's return with assurances that no cut was contemplated, the strike ended. It seemed likely to become of long duration because while the men were on strike they decided to ask that they be paid for yardage and that William Martin be selected as checkweighman.

The Right of Transference to a Working Mine Is Contested

In Kansas 1200 miners employed by the Sheridan Coal Co. and other small subsidiaries walked out on Aug. 3. The trouble appears to have arisen from a clause in the contract which promised to give work in the other mines of the same company to the men in any mine which may be shut down. The question has arisen whether the W. B. McCormick Coal Co. operation at Mulberry, Kan., is so related to that of the Sheridan Coal Co. at that same place that the men if rendered idle at one mine are entitled to work at the other.

The damage suit of the Coronado Coal Co., etc., vs. the United Mine Workers of America was again presented before Judge Youmans in the Federal court Aug. 2. The issue was argued and submitted on the demurrer of the plaintiff's amended complaint. The damages claimed are for $427,820.77, but as the law requires triple damages in such cases, it is expected that the award will be for $1,283,462.31.

In the anthracite region of Pennsylvania, John P. White has continued his canvass for union members, urging that John P. Mitchell and J. T. Lewis failed to get the miners what they wanted for lack of adequate support and because the men would not join the union in sufficient numbers.

More Men Will Be Tried in Colorado

The trial for murder of Edward Doyle of the United Mine Workers, William Hickey, secretary of the State Federation of Labor, Joe Potestio, John O'Connor and John Cassidy, officers of the Louisville and Lafayette local miners' unions in Boulder County, Colo. respectively, is set for Aug. 23. An attempt has been made to quash the indictments on the ground that the district attorney was not properly elected to office. This plea was overruled by Judge Neil.

Many speeches are being made to bring pressure upon the authorities to release John R. Lawson and to prevent other men from suffering the same penalty. The case of Lawson has been compared to that of Charles Becker, the police lieutenant in New York City. Lawson, like Becker, did not murder anybody, but the jury believed he was guilty of procuring and causing murder. John P. White has made many speeches in the anthracite region before audiences not wholly composed of miners. In all of these he has condemned the conviction of Lawson in unsparing terms. The plea for the defense of Lawson has been the more forceful because that strike leader was formerly a resident of Locust Gap, Northumberland County, Penn. President Gompers of the American Federation of Labor has also issued a denunciation of the conviction. He appeared at a meeting in Philadelphia with Gifford Pinchot, formerly chief of the Bureau of Forestry; Frank Morrison, secretary of the Federation; William Green, secretary of the United Mine Workers of America, and the Rev. Dr. Samuel Zane Batten, chairman of the Church Federation. This meeting in a resolution denounced "the coal companies for their flagrant dominance of the government and courts in various parts of Colorado" and urged the removal of Judge Granby Hillyer Attorneys for John R. Lawson appealed to the Colorado Supreme Court on Aug. 3 for a new trial.

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Pages from a Miner's Notebook; The Script System

The "scrip system" in vogue in many coal camps of the country has received much publicity during the last year. Many articles have appeared in the public press, written no doubt by men who have never actually handled a five-cent piece of scrip, but have gained their knowledge of the "iniquitous" system from some disgruntled employee condemning the system heartily. I have never availed myself of this easy method of getting beer money between pays, but I have heard it damned and reviled times without number by those very ones who seemingly are most willing to take advantage of it when their supply of cash runs short—which usually is not long after payday. There may be many evils connected with the system—evils promoted by the shiftlessness of those who draw scrip. As to that I will not say, but today I witnessed one of the good points of the system.

One of the men formerly employed here who went on strike moved his large family back here the other day. He had been out of work for 18 months through no fault of his own except an abhorrence of being called a "scab," and his family of six were actually suffering. He moved back into the same house he occupied before the strike, but his once-thriving little garden was mostly weeds, and the weeds had taken possession of his neat graveled walks from gate to front door and from back door to coalhouse. He was practically destitute. There was not sufficient food in the meager load of stuff he brought back for three good meals for himself, who needed food to work, let alone his wife and five children.

He is on the night shift and went hungry to work that night. I greeted him as I came off shift, and he returned my greeting with cheery words, but I saw tears in his eyes. We had known each other well in more prosperous days and had been friendly through the lean days now ending. But he did not ask for assistance, and knowing him, I did not offer help. Not so my wife. Scarcely had he left his house when six steaming plates of soup with coffee, bread and such other food as our scanty larder could afford were on their way to the house that is once more to become a home in reality as well as in word. There is a sympathy between mothers of children that surpasses any similar emotion between man and man.

But I am getting away from the subject. My friend worked that night. He worked last night. And today he was allowed to draw scrip. Not much, but sufficient to provide food for himself and family the remainder of the week.

I greeted him as I came off shift. He returned my greeting cheerfully as before, but there is another look in his eyes; the gaunt, drawn look has disappeared from his face. He is a man again. The "iniquitous" scrip system has enabled him to supply the necessities of life to his family without the charity of his friends and without the privation that would have been forced on them had he been compelled to wait for payday. He is already providing the necessities; his first pay will bring again some of the luxuries.

Let those who will, curse the scrip system. My friend and I will not argue, I warrant, but we have learned another lesson.

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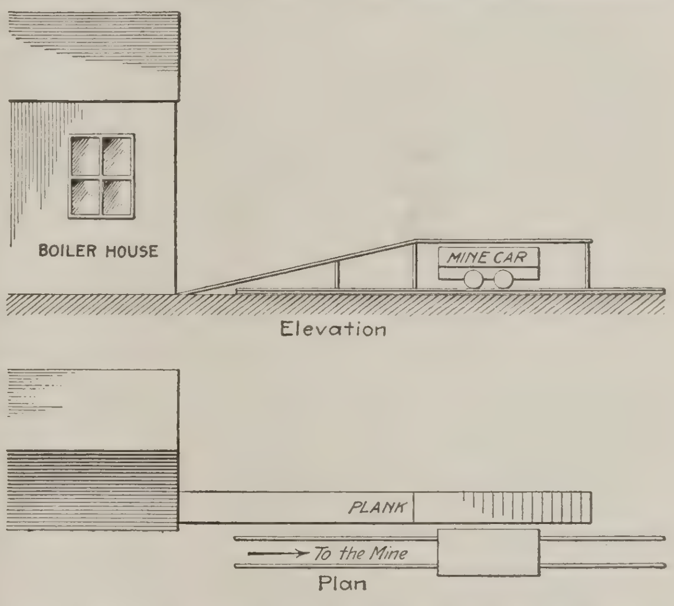
Raised Platform for Ash Removal

At one of the mines near Brier Hill, Penn., the ashes from the boilers were formerly loaded into wheelbarrows and wheeled to a pile 30 or 40 ft. away. The ashes were allowed to accumulate here for several weeks, when a horse and wagon would be pressed into service to haul them to the dump.

This necessitated the handling of the ashes twice, and in addition the unsightly pile was always in evidence.

Through the erection of a raised platform, as shown in the accompanying sketch, the ashes are now wheeled and dumped directly into pit cars and are then hauled into the mines and utilized as ballast on the haulage roads.



THE RAISED PLATFORM FOR LOADING ASHES INTO MINE CARS

The ground around the boiler house is now always in a neat and clean condition, and the cost of handling the ashes has been reduced.

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When Property Becomes a "Coal Mine"—In a suit for death of a miner, the jury was warranted in finding that the place where the accident occurred had become a "coal mine" within the meaning of the Illinois laws, which provide for the inspection of operated mines, where shafts had been sunk, entries driven and coal had been removed, although the mine had not been put in complete order for the employment of the larger force of men which it was intended to employ when additional appliances should have been installed. (Illinois Supreme Court, Hakanson vs. La Salle County Carbon Coal Co., 170 Southwestern Reporter 617.)

New Anthracite Rate Decision

SYNOPSIS—The new cut in the anthracite freight rates is one of the most sweeping decisions, as affecting the hard-coal industry, that has yet been rendered.

Herewith is presented a summary of the principal points covered in the decision of the I. C. C. in the anthracite rate case as abstracted from the *Boston News Bureau, Philadelphia News Bureau* and other sources. In its decision the commission holds:

1. That the rates on anthracite coal from producing districts in Pennsylvania to the tidewater ports and certain Eastern interior points are unreasonable.
2. That the carriers, by means of trackage arrangements and the free transportation to junction points in the mining region of coal exchanged by their allied coal companies, have extended the advantage of intra-line transportation to their coal companies to the prejudice of other shippers.
3. That concessions and offsets granted by the carriers to their allied coal companies in the form of interest charges, royalty earnings, the use of valuable property and inadequate rentals, the free use of the carriers' funds and credits are as pernicious as direct cash rebates. Such concessions and offsets are unlawful.
4. That lateral allowances paid to a coal shipper in accord with an agreement alleged to be additional use for a facility furnished by the shipper are unlawful rebates.
5. That with but few exceptions the railroads own the entire outstanding stock of the coal companies whose product they transport.

The changes in anthracite rates are summarized in the following:

COMPARISON OF THE OLD AND NEW RATES

	Prepared Sizes		Steam Sizes	
	Old	New	Old	New
Del., Lacka. & Western:				
Hoboken (tidewater)....	$1.60	$1.45	$1.45	$1.35
Paterson, N. J..........	1.60	1.45	1.45	1.23
Newark, N. J............	1.60	1.40	1.45	1.30
Binghamton, N. Y.......	1.65	.90	1.50	.82
Elmira, N. Y............	1.65	1.25	1.50	1.14
Corning, N. Y...........	1.90	1.35	1.65	1.17
Dansville, N. Y.........	2.00	1.60	1.75	1.40
Syracuse, N. Y..........	1.90	1.40	1.65	1.22
Utica, N. Y.............	2.00	1.50	1.75	1.31
Lehigh Valley:				
Jersey City (tidewater).	$1.60	$1.45	$1.45	$1.35
Newark, N. J...........	1.60	1.45	1.40	1.30
Waverly, N. Y..........	1.65	1.15	1.10	1.05
Ithaca, N. Y...........	1.65	1.45	1.50	1.32
Depew, N. Y............	2.00	1.95	1.75	1.71
Rochester, N. Y........	1.90	1.80	1.65	1.61
Erie R.R.:				
Jersey City (tidewater)..	$1.60	$1.45	$1.45	$1.35
Paterson, N. J..........	1.60	1.35	1.45	1.22
Newark, N. J............	1.60	1.40	1.45	1.30
Middletown, N. Y.......	1.60	1.05	1.45	.95
Hornell, N. Y..........	2.00	1.60	1.75	1.40
Rochester, N. Y........	2.00	1.85	1.75	1.61
Central R.R. of N. J.:				
Jersey City (tidewater)..	$1.65	$1.60	$1.40	$1.35
Elizabeth, N. J..........	1.55	1.40	1.40	1.30
Somerville, N. J.........	1.55	1.20	1.40	1.09
Delaware & Hudson:				
Windsor, N. Y...........	$1.65	$0.85	$1.40	$0.92
Ninevah, N. Y...........	1.65	.90	1.40	.76
Oneonta, N. Y...........	1.75	1.20	1.50	1.03
Albany, N. Y............	1.95	1.60	1.60	1.31
Troy, N. Y..............	1.95	1.60	1.60	1.31

Rates for intermediate points will be arranged on a similar basis. A different schedule of rates is given on shipments consigned free on board vessels or for reshipment by water. Under this class of shipments Jersey Central rates of $1.55 on prepared sizes and $1.40 on smaller sizes to Elizabethport, N. J., are reduced to $1.40 and $1.30 respectively. Reductions for other roads on such shipments are:

Philadelphia & Reading to Port Reading, N. Y., from $1.55 and $1.40 to $1.40 and $1.30.

Lehigh Valley to Perth Amboy, N. J., from $1.55 and $1.40 to $1.40 and $1.30.

Erie Railroad to Weehawken, N. J., from $1.60 and $1.45 to $1.45 and $1.35.

Joint rates by Erie and New York, Susquehanna & Western to Undercliff, N. J., from $1.60 and $1.45 to $1.45 and $1.35.

Joint rates by Wilkes-Barre & Eastern and New York, Susquehanna & Western to Undercliff from $1.60 and $1.45 to $1.45 and $1.35.

Lackawanna to New York lighterage stations from $1.58 and $1.43 to $1.45 and $1.35. Ontario & Western to Weehawken, N. J., from $1.60 and $1.45 to $1.45 and $1.35.

Joint rates of Delaware & Hudson, Erie and Susquehanna to Weehawken from $1.60 and $1.45 to $1.45 and $1.35.

Joint rates of Delaware & Hudson with Ontario & Western to Weehawken, N. J., from $1.60 and $1.45 to $1.45 and $1.35.

Joint rates for Delaware & Hudson, Lackawanna, the Pennsylvania and Northern Central to South Amboy from $1.55 and $1.40 to $1.40 and $1.30.

THE TRADE AND THE ORDER

The effect of the order has upset trade calculations. At best the outlook was not encouraging, but the consequent uncertainty as to great matters has made the immediate future of the distribution and price of coal dubious. The demand for coal at the moment is light, but this might have been changed materially in the next few weeks.

Old observers now expect that coal dealers and consumers will be distracted by the new prospect, and will make sparing purchases, and await a clearing of the situation. Whether the companies go into court or whether the commission's order goes into effect on Oct. 1, the consumer of coal will be in doubt as to the proper course to take as to the autumn requirements and will naturally restrict operations.

Under the usual rule the consumer will pay the bill, but it will not be done in a hurry, pending developments which will be perplexing and mystifying to every one. The trade has other matters of interest before it, including the wage scale and new and stronger competition of bituminous following the Interstate Commission's order.

A leading official of one of the largest coal companies says the decision will have no effect on the price paid by consumer. The companies which suffer by decrease of income from transportation will, through coal companies in which they are interested, increase the price of coal at the pit mouth. The consumer will pay the same amount on line or at tide as he has been doing. In effect there will be no real results in cheapening of the commodity. Delaware & Hudson Coal Co., Pennsylvania Coal Co. of the Erie, Coxe Bros. & Co. and Lehigh Valley Coal Co. investments of Lehigh Valley R.R., Lehigh & Wilkes-Barre

Coal Co. of Jersey Central and others will benefit and the railroads will not suffer. Coal men are thus disposed to view less seriously than at first the supposedly drastic quality of the decision.

Official Opinions on the Decision

President L. F. Loree of the Delaware & Hudson Co. criticized the Interstate Commerce Commission in a statement he issued on the anthracite-rate decision. He criticizes the commission for the way its investigations were conducted and suggests that the loss in revenues will not be restricted to the coal-carrying roads, but will extend to the other Eastern roads. President Loree in part said:

"The carriers believed that it would tend toward a clear understanding of the problem of anthracite transportation if the commission could be induced to go to the anthracite region and personally to witness some at least of the principal operations incident thereto. An invitation was accordingly extended, through counsel, but the commission failed to avail itself of the opportunity.

"The best year of the last 16 for the anthracite carriers, as shown by the financial results of their operations, was the year 1907. In that year the net corporate income, after paying wages, other operating expenses, taxes and interest upon indebtedness, averaged only 7.41% of the cost of their properties, while in 1914, the worst year, it fell to 5.06%.

Gross Receipts of the Railways

"Omitting the Pennsylvania system, the total gross receipts from all operating sources of the other railways serving the anthracite region in 1913 was $274,593,886, and no less than $85,618,436 of this aggregate, or 31.6%, came from the transportation of anthracite. Disregarding their passenger business, which all authorities agree does not produce an adequate return upon the property used in the public service, it appears that 44.9% of the freight receipts of these railroad companies was derived from anthracite."

Vice-President Loomis of the Lackawanna said: "The practices which the commerce commission has scored so severely were corrected more than a year ago. The reduction in rates does not affect Lackawanna so severely as those roads whose traffic runs almost entirely to tidewater, like the Reading and the Jersey Central. The ruling of the commission is entirely arbitrary, and there is no appeal. It is interesting to note that the long investigation by the commerce commission was not started because of the complaint of any shipper, but was carried out on the commission's own initiative."

President F. D. Underwood of the Erie says: "If the reduction of the coal rate goes to the consumer the gain to them is apparent. But should it go as it has in the past to the middleman, we have the spectacle of the owners of railway securities being robbed for the benefit of the dealer. In other words, it simply means taking the money of the many for the benefit of the few. This is a ruthless, unnecessary proceeding, giving a serious blow to all investors, among which are savings banks and insurance companies."

It is understood on excellent authority that the anthracite roads will appeal this decision and carry the matter through the courts. In this event the new schedules may not become effective for some time.

The Trend of Conditions on New Contracts

July and August are usually very dull months for contracts, and this year is no exception. The Narragansett Electric Lighting Co., Providence, R. I., placed its contract early in August for 40,000 tons of New River with the Eastern Coal Co., of Providence, but the latter, by reason of location, is the only dealer in position to name a favorable price and the award was not in any way significant. It is understood it was closed on practically the same basis as last year.

Except for this order not a fair-sized piece of wholesale business has been placed in New England since July 15 that is in any way significant. A few large buyers, mostly in the textile industry, have refrained from making comprehensive contracts, and thus far they have arranged for current requirements in the open market. Purchasers of this kind will not make contracts until they are satisfied that the low point of the season has been reached. The supply of water power has a material bearing on probable consumption, and the uncertainty over water freights along the coast is another important factor.

The orders placed the past month were almost exclusively of the municipal or county or state character. As a whole the awards have been on about the same price level as in 1914, there being no pronounced trend either way. Aside from special cases, private concerns in New England seldom enter the market for contract at this season. The pressure is all for contracts as early in the year as possible, and from July 1 ordinarily there are only fugitive items to report. So far as 1915 is concerned, the record of the year is about made up, particularly on what are known as the comprehensive orders.

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Exports from Philadelphia

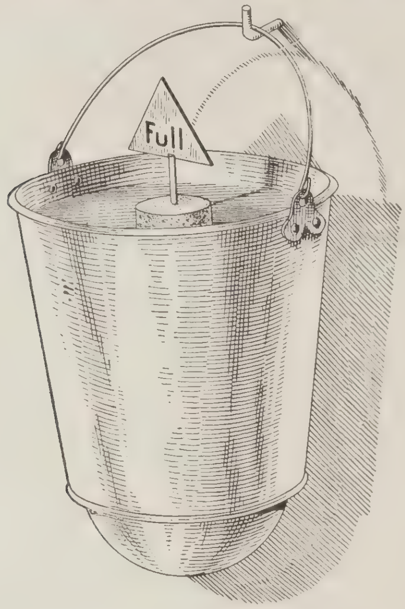
The port of Philadelphia is enjoying a boom owing to the vast quantities of material being exported to foreign shores, not only to the belligerent nations, but to those countries whose ordinary sources of supply have been cut off. One of the commodities greatly contributing to this increase is bituminous coal. For the six months ended June 30 the shipments totaled 406,963 tons, or a gain of over 30 per cent. For the three-month period ending with June there was exported 290,340 tons, being a gain of 125 per cent. The July tonnage will approximate 160,000, while last July less than 50,000 tons was shipped.

Most of the cargoes are destined to Italy, France, Spain, Brazil, Norway, Argentine Republic and Chile. These countries heretofore received the bulk of their supply from Wales, France and Belgium, but they have all been compelled to seek other sources since England has practically placed an embargo on coal, while the fields of France and Belgium are held by the German army. Inquiries are received daily for American coal, but difficulty is experienced in securing sufficient ships, and the rate is high. This scarcity of vessel tonnage has resulted in many boats, that were practically worn out being refitted.

The bunker coal men who were deprived of the greater portion of their trade by the withdrawal of many of the merchant ships are taking advantage of the opportunity for an outlet for their coal in the rapidly developing bunker trade that has arisen in connection with the opening of the Panama Canal.

An Indicator for Fire Buckets

The accompanying illustration shows an ordinary fire bucket equipped with a simple and convenient contrivance for showing the amount of water it contains. The device consists of a cork or metallic float with a stiff wire spindle passed through it, on the top of which is fastened a triangular piece of sheet tin or aluminum, painted and lettered in colors that will contrast with the surroundings.



A SIMPLE FIRE-BUCKET INDICATOR

This indicator saves the watchman from climbing on workbenches, up posts or the sides of the walls to see that the water buckets are properly filled, as insurance associations require.

When the bucket is full, the sign is visible for a considerable distance, but when the water has evaporated so that the bucket is only partly filled, the float disappears below the rim. These floats would also be an aid to the insurance inspectors when visiting plants which have adopted these simple devices.—C. D. Parkhurst, in *American Machinist,* July 22, 1915.

* * *

Western Rate Case Decision

The new decision of the Interstate Commerce Commission in the Western rate case denied the request of the carriers for increased freight rates on a majority of the schedules under consideration, but allowed certain increases. It particularly admitted the contention of the Illinois coal operators to the effect that their interests would be injured by an increase in coal rates to points in Wisconsin and Minnesota as well as the Dakotas. The opinion was advanced that the cost of hauling coal to Wisconsin and Minnesota justified increases in rates, but that it did not justify an increase in the Dakota rates. In suggesting increases in the lake rates it says:

"From other facts of record it appears that past increases in rates from Illinois, without corresponding increases in the rates from the docks, have resulted in relatively lessening the amount shipped from the Illinois mines."

The greatest fight during the hearings on the proposed increases centered around the rates on grain products, live stock, packing-house products and coal. The railroads lost in every instance except on the coal rates. Even this was only a partial victory, inasmuch as the increases to South Dakota territory were not allowed, and the commission suggested that the lake rates from Pittsburgh should be increased in proportion to the advance in rates from Illinois territory. How much the carriers will profit through this decision, especially on coal, is uncertain and problematical, but they are generally dissatisfied with the outcome.

While there has not yet been sufficient time to thoroughly digest the decision, it is evident that the commission has made rulings decidedly adverse to the Western coal interests. The effect will be to eliminate, in a large measure, all but the very best Western fuels from the Minneapolis and St. Paul markets. They have always been very nearly on a parity with eastern coals via the Lakes, and the differential against the Illinois product in the "Twin Cities" will now be about 10c. per ton. It is apparent the docks will benefit materially, unless the Western operators elect to sell their coal below cost of production.

Both the coal shippers and railroads are disgruntled with the decision, and it is possible the rail interests will ask for a rehearing. It is quite evident that the Illinois operators will lose a large slice of territory in which their coals have been sold and in which they have been marketing an increased tonnage for several years past. Prominent southern Illinois coal operators are of the opinion that the commission has brushed aside all protests of the coal men and decided in favor of the roads, and the attitude of the commission contrasts sharply with its opinion made but a few months ago in regard to freight rates in the Eastern territory.

* * *

Annual Meeting of American Mining Congress

The annual meeting of the American Mining Congress will be held at San Francisco beginning Monday, Sept. 20, and the American Mine Safety Association will also have its meeting in the same city on Sept. 23 and 24. The week beginning Sept. 20 should see more mining men in San Francisco than in a long time. The headquarters of the Mining Congress will be in the Palace Hotel, and delegates and members will receive special rates of $6 a day for a room occupied by two persons and $4 per day for one person.

Carl Scholz, president of the congress, intends to make up a party of possibly 15 to 20 members and their families to occupy a special car leaving Chicago at 10 a.m., Sept. 15, on the Rocky Mountain Limited, which will reach Denver at 2:45 p.m. the next day; leave Denver at 5 o'clock that evening on the Union Pacific road, arriving at Salt Lake City the next day at noon; remain there over night and leave on the early morning train for San Francisco, arriving at destination Sunday morning, Sept. 19.

Any Eastern coal or mining men desiring to join this party should advise Mr. Scholz in Chicago as to what space they will require, so that suitable accommodations consisting of compartments and drawing rooms may be provided in a special car. Since a large attendance is expected, as early notice as possible should be given of reservations desired.

Editorials

Explosibility of Coal Dust

A coal dust with a high percentage of moisture is not necessarily inexplodible though it has been frequently asserted that it is. The tests of the United States Bureau of Mines have shown that a certain coal dust from Utah with nearly 15 per cent. of moisture will explode with a rise in pressure far greater than that obtained on exploding some of the coal dusts of West Virginia containing less than 1 per cent. of moisture. The water in that Utah coal does not appear to make it safe. That, at least, is the testimony of experiments on a laboratory scale.

In the Utah coal mentioned there is much volatile matter, but in that from West Virginia far less, and the great quantity of bituminous matter in the first coal appears to overcome the immunity from inflammation which might otherwise result from the presence of uncombined moisture.

But all immature coals contain not only much water, but also much volatile matter, so it is not safe to suggest that immature coals are safe; and on the other hand, there is abundant evidence that while mature coals are not easily inflammable in laboratory experiments and do not generate high pressures, yet in actual tests, when dusts are detonated, the dusts from such mature coal can produce most disastrous effects; for being able to generate the maximum heat, they assure the greatest possible expansion and the highest pressures.

The safety of Montana coal mines from explosions has been ascribed to the presence of moisture in the coal, and it is true that the water content of the samples of coal that have been investigated is high, while the inflammability is abnormally low. But while the moisture is possibly a cause it is not the sole reason for the safety of the dust. Apparently its nonfriability is not an important cause either, for even when ground fine for inflammability tests the dust generates little pressure on inflammation by an electric current.

The two Montana dusts tested by the Bureau of Mines were reasonably low in ash, and there is not a hint of the reason why they should be so resistant to inflammation. Until more is known and until the value of the tests of inflammation as a true index of explosibility is proved, it is best perhaps to sit on the fence and declare that we do not know why one dust explodes with ease and violence and another dust with difficulty and without energy. All we do know is that it is almost impossible to explode under working conditions a mineralized carbon dust like anthracite.

As further evidence of the explosibility of substances containing moisture it may be added that no difficulty has been found in exploding the dusts of grain, by intention or by accident. These dusts all appear to contain from 6 to 10 per cent. of moisture, and some also as much as 16 per cent. of ash. But these impurities do not prevent such dusts from the sudden propagation of flame.

If the reader will consult "The Explosibility of Grain Dusts," by David J. Price and Harold H. Brown, of the Millers' Committee of Buffalo, N. Y., he will find that yellow corn with 10.06 per cent. of moisture ignited at 1025 deg. C., while oats with only 6.79 per cent. of moisture resisted ignition till raised to 1280 deg. C. The yellow corn to which we have referred when exploded at 1200 deg. C., gave a maximum pressure 1.83 times that of Pittsburgh standard coal dust, the highest pressure observed; but when a drier wheat dust with about 7 per cent. of moisture exploded at that same temperature, despite its dryness, it only gave, roughly, half the pressure. So a moisture-laden carbohydrate is not without its dangers. Though moisture probably is a protection it is not an unquestionable guarantee of safety.

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The Wasteful Yet Economic Beehive Oven

Much has been said in recent years concerning the wastefulness of coking coal in beehive ovens. To this subject much space has been devoted in the public press, both technical and popular. The major portion of coke made in this country has been and still is burned in beehive rather than in byproduct ovens. In this respect the industry presents a marked contrast to the practice in some other countries, Germany in particular.

Wasteful as our methods may appear, it should be borne in mind that the coke industry, like all other industries, makes permanent progress through economic expediency only. When circumstances are such that an attractive dividend may be earned on a given investment, regardless of whether the sum involved be one dollar or a hundred million dollars, it is reasonably certain that the investment will be made. Byproduct coke ovens cost more money than do beehive ovens. They are, however, being built about as rapidly as good engineering economics will justify their erection.

In considering the replacement of beehive ovens by those of the byproduct variety one important fact should not be overlooked—that is, the most bulky as well as, under ordinary circumstances, most valuable byproduct evolved in coking in the retort oven is the gas. Unless this can be used at or near the oven, either in some industrial process or for domestic purposes, no benefit is secured in byproduct coking commensurate with its increased expense.

It is this consideration of the utilization of the gas that is leading to the establishment of byproduct ovens only at large centers of population or at points of concentrated metallurgical or industrial activity. The past few years have witnessed the establishment of successful byproduct coking plants at steel mills, such as those at Joliet, South Chicago and Gary, and at several cities—namely Indianapolis, St. Louis and Chattanooga. At these points the gas may be successfully utilized either as a metallurgical or a domestic fuel, or both.

The coke-makers of the United States can hardly be expected to radically alter existing and well-established methods of manufacture to suit merely the whims or beliefs of ultra-conservationists. When the time arrives when byproduct coke ovens become economically expedient, we may logically expect that byproduct ovens will be built, and the byproducts secured by this method of coking will no longer, as now, literally "go up in smoke" to pollute the atmosphere, destroy vegetation and damage property. Until that time arrives, however, it is highly probable that beehive coking will continue to be practiced.

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The "Adscripti Glebae" of Modern Commerce

In earlier days in Europe the peasants were attached to the soil. When it was sold they went with it as part of the bargain. They were sometimes known as *adscripti glebae*, or serfs of the soil, though these words were coined by Roman jurists to express the condition of *coloni* who were not altogether at the pleasure of the land owner. These adscripts worked and were sustained by the owner of the estate, whether prince or priest, lord or monk.

While there were many instances doubtless of liberality, there were also numberless cases where the owner of the property contented himself with giving the adscripts the very meagerest of living. From these serfs of medieval and premedieval days it is a far cry to our present conditions. But there is an analogy, not to be pressed too far, in the relation between the railroads and the coal corporations.

A coal company is an adscript, attached to the soil. It can only get its product where it owns a coal property, and it can only ship its property by the railroad which runs to that piece of coal land. Only rarely can any choice of railroads be made. But on the other hand, the man who makes a valve or mining machine can build it in Connellsville, Penn., or in Columbus, Ohio. He can thus choose his railroad and can dicker for rates.

Even if he is established and has his factory built, he can look elsewhere, and eventually move his machinery where freights and other conditions are favorable. He can probably even get the money for the change and for building a factory or part of it from the town to which he moves. He can thus register an effective complaint against the railroad if it keeps him from an available market or if it prevents him from making a profit.

But the coal-mine owner is fast bound to the soil, and the railroad knows that this is a fact and regulates rates accordingly. Even if the mine is closed down, the railroad company figures it will remove the tonnage eventually. The income may be delayed, but it is certain as death and taxes that some time it will be received.

The gross earning is the product obtained by multiplying the tonnage of the coal area and the freight rate. Delay it, and it will not be less; accelerate it, and it will never be more. And if the operator holds the land as in a dead hand, taxes, interest and depreciation will waste his capital, leaving the railroad but little affected.

The railroad feels also in many cases that coal taken beyond its confines is assisting other railroads at its own loss and therefore is but little interested in giving a liberal rate.

How different is the situation in dealing with an industry which is free to select a site. The railroad company makes for this trade the best dicker it can secure. Overhead charges that must be borne in any event, whether the traffic is hauled or not, are generally overlooked. The interest on the cost of railroad construction must be paid, but it is not met by the factories so much as by those operations which are *adscripti glebae*—the coal mines, the clay works, the quarries and the lumber mills.

Moreover the railroad remembers that these latter all have a certain time to run. They may bring a fleeting population, but no permanent business; whereas a factory established successfully brings an income for as long as freight rates are equitable.

Thus it is that the mines are burdened with unreasonable freight charges. It is generally recognized that despite the fact that heavy freightage is the most desirable because the most cheaply handled, it is nevertheless the most grievously burdened. The general public would think the price of coal ridiculously low and would regard the coal operator as a public benefactor if when the coal bill had to be paid the railroad company did not ask two or three times as much as the operator and the retailer did not, as he often does, add for his services as much as the operator asks for the coal.

In the older states the railroads are not really profiting by these high rates. It is well known that in the new states, where they do not obtain, the railroads are making money out of the large tonnage they haul. They are proving that a liberal policy pays and that the uncertain operation of impoverished coal mines which can only work in busy seasons does not remunerate the railroad company. A fairer policy would do good all around. The railroad company can hardly afford to wait for this good business any better than the coal operator. Because the serf is a serf does not prevent it being good policy to see that he is well fed.

But the railroads in the older coal states cannot see it, though the condition in Ohio may yet make it clear to them. The operator has been restrained for years; in fact, he has made little money since the old grafting years when conditions were made favorable if the railroad men were presented with stock or were assisted with money. Since a more strait-laced time has succeeded, no one is enriched—neither the railroad, the coal men nor the transportation officials, except where a most liberal policy is pursued which awards the first a steady, increasing yet remunerative traffic, the second a regular, growing and profitable business and the third salaries in accord with the importance of their public services.

In this review of the adscripted character of the coal industry no attention has been paid to its restriction to the kind of coal bed, grade of coal, etc., on its land which is well noted by F. I. Pearce in this issue. From a mine practically but one kind of product can be obtained, whereas a factory can modify its output to suit its pleasure, and a firm producing plowshares may shortly afterward be making mine shovels and without a change in base. This, however, is a matter which explains the misfortunes of coal companies rather than the part which railroads have in them.

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Don't forget that the Sept. 4 issue of *Coal Age* will be devoted to mine ventilation, and we invite articles on this subject from all our readers who have at hand interesting data concerning successful ventilating plants or methods. Send your contribution at once.

Sociological Department

Modernizing Morea

Housecleaning, either indoors or out, is best done by a woman. Acting on this basic principle, T. M. Dodson, who directs the affairs of the Dodson Coal Co., consulted Dr. T. C. Rutter, his resident physician at Morea, a year ago, and the result was the acquisition of the services of Miss Anna Barager, a graduate nurse, who has made Morea one of the best looking and most sanitary mining towns in the anthracite region.

Morea is now 27 years old, but several years ahead of its time. It contains about 145 houses and some 1100 people, and it was not an unpresentable place a year ago, but it didn't suit Miss Barager. There were ditches to be cleaned out, garbage to be hauled away, unsanitary outhouses to be moved farther away from the homes, and when everything was spick and span it had to be kept in that condition.

Home Keeping Taught and Sanitary Stable Equipped

The inhabitants of Morea are of many nationalities and at first they didn't understand very well why such radical innovations were necessary. But the visiting nurse was inflexible. She was given a team of horses and a cart, and authority to urge anyone who didn't like clean, sanitary surroundings to go and live elsewhere.

PART OF MOREA SHOWING STORE, SCHOOL, CHURCH AND STATION

VIEW OF MOREA LOOKING UP VALLEY

STORE OF THE MOREA SUPPLY CO.

VIEW OF MAIN STREET OF MOREA COLLIERY

SANITARY BARN AND INSPECTED STOCK

PICNIC GROUND SHOWING HANDBALL COURT, KELLY SLIDE, SEESAWS, DANCE PLATFORM AND BALL GROUND

But public health is not merely a matter of clean houses, yards and streets and excellent hospitals above and below ground. Miss Barager went indoors and taught the mothers how to feed and clothe and bathe their babies properly. There are from two to four in each family and more often four than two. The quantity and quality of the local milk supply was another problem, and Morea now boasts a sanitary cow-stable with 16 blooded cows.

There are also a fine athletic field which cost many hundreds of dollars, a summer dancing hall, picnic grounds and a clubhouse equipped with shower baths, hot and cold water and all conveniences. In the way of entertainment there are moving pictures every night at the club and dances are held frequently. The building is supplied with card and pool tables, and in its reading room the latest magazines are filed. On holidays and important payday Saturdays there are local athletic meets, and at stated intervals there are contests with the Beaver Brook colliery of the Charles M. Dodson Co., comprising races, tugs-of-war, baseball games and many other events. Morea has a fine baseball team.

BASEBALL DIAMOND

Sound minds go with sound bodies, and the local school makes good the adage. Miss Barager added a sewing class to the curriculum, and there is even an extra school session held twice a week for foreigners. But this is small, as most of the children speak English. In a recent report Superintendent Noonan, of the schools of Mahanoy township, highly commended Miss Barager's work and its effect upon school attendance.

There are over 800 men who work at the Morea colliery. About a hundred of them come in on early morning work trains from Frackville, Mahanoy City and Pottsville, but the rest live near the mine in the company houses. This concentration has enabled T. M. Dodson to exercise the beneficial control over their health, surroundings and entertainment that was the primary aim of the coal company, as outlined in the foregoing statement. Throughout the anthracite region there is a similar tendency toward not only the sanitation but beautifying of the collieries and mining patches. Thousands of dollars have been spent by the Kingston Coal Co. in the making of five big playgrounds for the children of the mine workers. Grass plots, flower beds, even a fountain, and whitewashed walls and fences have long since improved the appearance of many Lehigh Valley collieries and those of E. B. Jermyn & Co. The great Loomis Colliery of the Delaware, Lackawanna & Western R. R. Coal Mining Department looks like a small university and its Concrete City, with a sanitary sewage system, is a model mining village. These are only a few detached instances of the many physical and æsthetic improvements which both the large and small companies are making.

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A State Safety Exhibit

The Pennsylvania Department of Labor and Industry has an interesting safety exhibit which it is placing in store windows in big industrial centers. J. P. Jackson, state commissioner of labor and industry, is the originator of the movement.

Such exhibits under the aegis of the state have a peculiar value. The admonitions of the operator may seem animated by self-interest, as indeed in part they are; but coming from the state itself and sustained by the taxes of all the citizens it gives the movement a wider meaning and suggests what is equally true—that all citizens have an interest in the safety-first movement, whether employers or employees. And this applies even to farmers who are said, not to employ a man, but to hire him. As the men are hired, not employed, of course they should not be indemnified in case of injury. Or is the distinction merely one of voting strength?

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In the Absence of System and Order in the lamp-room, as regards cleaning, fitting the parts and handing out the lamps, curious things may occasionally happen. One of the most amusing—of course it might have had serious consequences—occurred a few years ago in South Wales. When all the men had been dispatched below, the alarming discovery was made that someone had got a safety lamp without having the protecting gauze upon it, the gauze having been found loose in the lamp room. A miner nearby was sent down to make a search. He traveled all round the pit and came out again without finding the culprit. Then, but not until then, was it found that this amateur detective was the very man who had the lamp without the gauze.

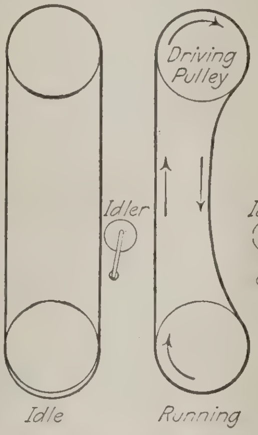
Discussion by Readers

Mining Machinery--Belting

Letter No. 2—Referring to Letter No. 1, regarding belts for driving mining machinery, *Coal Age*, Aug. 7, p. 227, I am not going to criticise any of the statements made by Chief Electrician. What he says in favor of horizontal slack-running belts with the tight or pulling side on the bottom whenever possible is correct.

Horizontal belts are always preferable where they can be employed; but it is often necessary to use vertical belts, and I wish to add a few comments to the remarks made in the previous letter. I want to suggest what may at first seem impracticable, but is nevertheless true; namely, a vertical belt can often be run slack the same as a horizontal belt and with the same advantage.

I have in mind a case where a vertical belt has so much slack that it drops away from the lower pulley when not running. I have illustrated this on the left, in the accompanying figure, which represents the belt not in operation. In this position it would be impossible to start a belt without the use of the idler shown at the side of the belt. When it is desired to start the belt the idler is thrown against it so as to take up the slack and bring the belt into contact with the pulley. In the case to which I refer there was so much adhesion between the belt and the two pulleys that, after starting the belt, the idler could be swung back and the belt would still hold fast to the lower pulley, as shown on the right in the figure.



A VERTICAL BELT

While this scheme is not to be recommended generally, it can often be applied in the case of large slow-running belts, especially where there is considerable adhesion between the belt and the face of the pulley. The pull on the tight side of the belt, being resisted by a slight drag on the slack side, is sufficient to keep the belt in contact with the lower pulley. This of course would not apply to small belts, or even large belts when running rapidly. As explained in the case of horizontal belts, the slack has the same effect to increase the arc of contact on both pulleys, and as a result the belt will exert a greater pull or transmit a heavier load.

W. F. S.

New York City.

Preventing Mine Explosions

Letter No. 6—I notice that Wm. Crooks, in his Letter No. 3, *Coal Age*, July 24, p. 143, criticizes the statement of Mine Inspector Rose, which appeared in the issue of May 8, p. 819. The statement was to the effect that "As long as coal is mined, disasters must occur."

After reading carefully the article of Inspector Rose, I am forced to conclude that the statement is very reasonable. We might as well criticise the statement, "As long as large cities exist, fires must occur." We realize that, in spite of the fact that every large city has a rigid fire-inspection system and maintains an elaborate and expensive fire-fighting apparatus and enforces underwriters' fire insurance rules, fires still occur with frequency. It will be generally agreed that the latter statement is a reasonable one, and if so, then the statement made by Mr. Rose is equally reasonable.

In spite of all precautions that coal operators and miners can take, and in spite of all the means used for the efficient ventilation of the mine and the installation of effective sprinkling systems to keep down the dust, and other like precautions, it must be acknowledged that mine explosions still continue. Their occurrence will be less frequent, no doubt, in proportion to the precautions taken and the means employed to avoid such disasters. But after all is done, I am prone to think that we will always have explosions occurring in mines as long as the coal-mining industry exists. I believe this as surely as I believe that fires must always occur in large cities. However, this conclusion makes it all the more necessary that the suggestions offered by Mr. Crooks at the close of his letter be carefully followed, though we cannot hope for the entire elimination of such accidents.

R. R. DUNLOP

Columbus, Ohio.

Prohibition and Welfare Work

Letter No. 1—I was much interested in reading the article on this subject written by H. M. Wassum, *Coal Age*, July 3, p. 3. After referring to the large sums of money expended annually by coal companies for the protection of the lives of their workmen and drawing attention to the fact that the companies are not only obeying the mine laws but are taking extra precautions whenever they think it necessary, Mr. Wassum says: "The men must be trained to become miners and not laborers. They must be shown that they have a responsibility and that they must assume it."

Mr. Wassum wonders if the coal companies are receiving full value for the money they spend for these purposes. My observation and experience have convinced me that although the first-aid work and organization have accomplished much and led to great improvements in the mining of coal the investment has actually brought but slight returns to the operators. I have decided that there are several reasons for this result and that the coal companies are in part to blame:

1. It is important that coal companies should see to it that their miners are not using too much booze. They should do everything possible to exterminate the saloon and stop the liquor traffic in mining towns and districts. In two mining towns I found that general merchandise checks issued by the company were taken at saloons in

pay for drinks and redeemed by the company. Such merchandise checks should not be negotiable. The practice enables the miner to squander his wages in drink, and pay day finds his family without means of procuring the little luxuries of life, outside of the bare necessities provided at the company store.

2. In most of our mines there is a large admixture of foreign labor, representing every language and religion. There are many Greek and Roman holidays, when the men lay off from work and there is much carousing. Many of the men are unable to return to work the following day, and some go to the mine in no condition to safeguard themselves or their fellows. As a result they engage in many dangerous practices, bumping the coal off the solid, firing unsafe shots, entering dangerous places in disregard of danger signals or other warnings, etc. It is up to the operator to reduce the dangers from this cause by every practicable means. It may be possible to provide attractions on such holidays that will draw the men from the saloons and interest them in more profitable and less harmful ways. Let these attractions be such that the foreigner will be interested in them.

3. There is in most mines a certain lack of discipline for what are too apt to be regarded as trivial violations of the mine rules and regulations. For example, when they can do so without being caught, miners are prone to do many things that are strictly forbidden. Although in most mines a special entry is provided for the men to travel on their way to and from their work, they will frequently slip out on the main-haulage road. It happens occasionally that the men doing this are caught in the act by the foreman or one of his assistants, but for this violation they are rarely laid off more than a day or two, which they do not regard as serious.

In many cases the mine law is violated by a foreigner who is not acquainted with its provisions. This shows the need of miners' training schools, especially for foreigners. In 1901 my brother lost his life through just such carelessness and ignorance as I have mentioned. It is important, therefore, that miners should understand the mining of coal under all conditions, in order to make safe and efficient workmen. Otherwise, many accidents will occur in the mines.

A short time ago a man who had been a blacksmith came to our mining town and secured a place to work in the mine. The first day he went to work I visited his place when he was preparing to fire a shot. He was working but a few yards from the heading. He was using squibs, and after he had made one or two unsuccessful attempts to fire the hole, I went in and examined the shot. I found three squibs stuck fast in the mouth of the hole. The man had claimed to be a good mechanic and to understand his work, but this incident shows that no matter how good a man may be in one line of work he must know how to dig coal before he can become a safe or successful miner. It shows, again, the need of a miner's training school.

The problem presents many difficulties. There is a peculiar lack of interest on the part of most of the foreign labor in mining in regard to such training schools. Recently I made an attempt in company with another man, to organize and establish such a school. Out of 150 foreign miners whom we approached, we were able to secure only five names for enrollment. We had much the same success in trying to interest foreigners in our political club, where they could be taught the principles of American politics and become better informed in regard to the mining industry. One man would say, "No, I will only be here a couple of years and then go back to the old country." Another would state that he could not live any better, if he should learn the English language, and claim that he is "too old to go to school."

Permit me to say in closing what I have stated in previous letters, that the proper certification of miners is one of the most important and necessary features of the coal industry in this country. I want to suggest that where coal companies are unable to start and maintain such training schools for their miners, this work should be undertaken by the Bureau of Mines, and a few years would see good results.

JOHN MAJER.

Listie, Penn.

Letter No. 2—The letter written to Superintendent O. P. Rater by an Austrian, and printed in *Coal Age,* July 17, p. 80, furnishes much food for reflection. The writer of the letter is seeking a job for himself and his companion in another mining district, and is willing to relinquish his present steady work and fair pay for less regular work and under conditions far less favorable in the mine. The reason given for desiring the change is that the place is "too dry" for himself and his companion.

To men who regard the drink habit as an evil, the picture presented here is a gloomy one, revealing as it does the craving for drink of a large portion of our mine workers. It emphasizes the fact that when removing the places where liquor can be procured it is absolutely necessary to supply something as a substitute. One addicted to the drink habit and failing to secure liquor at the common resorts will either take in its place what the "bootlegger" has to offer or resort to the use of drugs.

The truth of this statement is clearly proved by the reports coming from Russia regarding the effect of the recent edict against the manufacture and sale of "vodka"—the favorite Russian drink, which contains a high percentage of alcohol and is intoxicating. Statistics that appeared in the July *Literary Digest,* as prepared by Dr. Novaselski, show that 313 deaths occurred from delirium tremens, in the period extending from Aug. 17, 1914, to Feb. 28, 1915. These deaths were due to the use of a cheap imitation of vodka. In the time mentioned, in successive periods of four weeks each, the number of deaths increased in the following proportions: 26, 33, 34, 43, 53, 58 and 66, showing that in the last period of four weeks the number of deaths was two and one-half times the number occurring in the first period. The rapid increase of the death rate from this cause was in direct proportion to the increased vigilance in the enforcement of the vodka edict, and the sale of the poisonous substitutes increased in the same proportion.

Although we are not mining coal in Russia, we may learn some valuable lessons from these data, which show the mistake of enforcing a wholesale prohibition measure without providing a wholesome substitute. We must recognize the fact that prohibition accomplishes only one-half of the necessary work. The saloon in a mining town supplies a two-fold want—it satisfies the craving for stimulants that is so strong in many and supplies a social element for others. The problem confronting temperance workers is how to fill the void and supply these needs when removing the saloon. It may be impossible to find a thoroughly wholesome substitute for liquor used as a stimulant. Strong coffee is often used.

The problem is not hopeless, however, in respect to the saloon as a social center. For this class a saloon provides a meeting place where congenial spirits discuss affairs of interest or enjoy a social game of cards or pool. The money spent in this way would go far toward the equipment of a club house where all of these and other pleasures could be enjoyed without the contaminating influences of the saloon. Such a club house could include a gymnasium and dance hall where suitable music could be provided.

The saloon makes itself attractive to its devotees. To counteract its influence, the miners' homes and surroundings should be made as attractive as possible. I am glad to say that the day of the common miner's shack is rapidly passing, and the attractively painted houses, grassy lawns and garden spots that have been developed largely as the result of the prizes offered by many coal companies for such improvements have taken their place.

Aside from home or club-house attractions, many miners can be interested in church work and social organizations. Many pastors in mining towns have been able, by different methods, to build up large Sunday School classes, sometimes inaugurating membership contests with classes in a neighboring town. In some places night schools flourish, which furnish to ambitious men the necessary means of improvement. This has proved a great advantage over home study, which always lacks the incentive that is necessary for the best results. In other places reading clubs and debating clubs have been formed, and these should always be encouraged.

There is sometimes a permanent amusement committee, charged with the duties of arranging public amusements of different kinds suited to the needs of the people. In this connection the younger sex are always interested in well-conducted dances, while the older men enjoy card games and other pastimes. Boys and men are always interested in baseball, football, running and jumping contests, etc. Good moving-picture shows are adapted to all and have proved very attractive. During the winter months amateur theatricals often elicit much interest and enthusiasm. Where there are a number of foreign-born people in the town, a play in their native costume and tongue could be staged with good effect. Folk songs and dances should be encouraged similar to the familiar "Bobby Burns." Every community should have its local band or officer, while choral clubs and good quartets always provide a source of profitable entertainment.

I offer these suggestions in the belief that they can be made an effective weapon in the fight against the saloon. In other words, the social life of the community can be made so pleasant and enjoyable that the saloon will sink into oblivion. No doubt some of the suggestions will not be applicable in some places, while others not mentioned here can be suggested to take their place. However, the general idea of providing pleasing and healthful surroundings can be carried out in every place.

Such efforts will unquestionably mold public opinion, which is the force that must be relied upon to drive out the saloons. Without favoring public opinion, prohibition laws cannot be passed or will not be enforced after they are enacted. At the present time public opinion in reference to prohibition is not a unit. There is too much leniency expressed because of a drinking father, husband or brother. Whenever the same condemnation is given to relatives or friends as to strangers, in respect to the drink habit, the liquor traffic will receive a serious blow.

In considering the suggestions I have offered, the question of expense can be disregarded, as the miners will generally be found willing to support such efforts when properly organized among themselves. I have seen successful chautauquas held in mining towns and cordial support given to Hungarian plays and Italian games. When properly conducted, each organization will become self-supporting and may in some cases become a source of revenue.

I have hesitated to refer to the financial aspect of this problem, believing that the more altruistic the motive, the more successful will be the result, but the increased efficiency of sober miners, the reduction of accidents and the more regular output of the mine as the result of these movements being started will certainly justify the hearty coöperation and support of both the company and its men. Employees who do not drink are of as great or greater importance to the coal-mine operators as to railroad companies. Few, if any, companies will fail to encourage and support efforts emanating among their employees and designed to make the community life more pleasant and bankrupt the saloon. The opportunity is ever present; what is needed is sympathetic and intelligent leadership.

Geo. N. Lantz.

New Straitsville, Ohio.

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Mining Laws and Legislation

Letter No. 8—I have read with interest I. C. Parfitt's last Letter No. 6, *Coal Age*, July 31, p. 183, and while it is not my purpose to continue the argument, as Mr. Parfitt evidently feels that he is right in his assertion that an assistant mine foreman cannot be held responsible for his act under the provisions of the bituminous mine law of Pennsylvania (1911), for the benefit of other readers I will draw his attention to the last section of art. 4 of the law, which he may have overlooked.

Mr. Parfitt states that I am giving my "opinion as to what the law should be," while he is trying "to show what the law actually is as it reads." I have read again carefully all the sections of art. 4, and it has strengthened my opinion that an assistant mine foreman is, as I said before, legally responsible for the district that he examines. I cannot but feel that Mr. Parfitt formed his conclusion before he had finished reading this article. The last section of the article (sec. 24) reads as follows:

> When assistant mine foremen are employed their duty shall be to assist the mine foreman in complying with the provisions of this act, and in the absence of the mine foreman, they shall perform the duties of the mine foreman and shall be liable to the same penalties as the mine foreman for any violation of this act.

If the reading of this section is not sufficiently conclusive, there is nothing I can say to make it clearer.

As to the responsibility of the mine foreman for any orders he may give his assistant, Mr. Parfitt considers this as applying only to specific orders or instructions, which is exactly the point. It is clear that no mine foreman would order a place that has been standing for several months to be again started until he has personally examined the same and is acquainted with its condition, so that he can safely assume the responsibility for giving orders to start the place.

In this connection I will refer to a case with which Mr. Parfit is acquainted and rehearse briefly an incident that he knows to be true.

At a certain mine a fatal accident occurred in a district in charge of an assistant mine foreman. One of the entries had been extended a short distance beyond the last breakthrough. A miner in attempting to push his car to the head of the entry was obliged to pass under an unprotected trolley wire. When pushing the car, his head came in contact with the wire and he was instantly killed. The assistant foreman was discharged as a result of the accident. Although the assistant foreman had only been employed in the mine a few days, he was promptly arrested for his alleged neglect in not protecting the wire. I do not remember how the affair was settled, but the mine foreman was not questioned in regard to the matter. At the same mine, another assistant foreman was promptly dismissed at the request of the mine inspector, because he had permitted the laying of a switch under an unprotected wire.

I fail to see the application of Mr. Parfitt's reference to a state assemblyman or Federal congressman being immune from arrest, but in answer to his question, "Why does a mine inspector make his recommendations to the mine foreman and not to the assistant foreman?" I will quote art. 19, sec. 13, which reads in part as follows:

> Upon the discovery of any violation of this act, or upon being informed of any violation of the act, he (mine inspector) shall institute proceedings against the person or persons at fault, under the provisions of sec. 2 of art. 26 of this act.

This reference shows again that the assistant mine foreman can be held legally responsibile for the results of his acts or negligence. Under this law the mine inspector can hold any man in the mine responsible for its violation. It is only natural that he should make his recommendation to the mine foreman as being the superior officer in charge underground, the assistant foreman being subject to the foreman's instructions. When assistant foreman, I have accompanied the mine inspector on his visits throughout my district of the mine, frequently though not always with the mine foreman, and in those cases the mine inspector did not fail to address his remarks to me personally when suggesting changes.

In closing permit me to say that I certainly do regard the mine foreman as being responsible for the kind of men he employs as his assistants, but nothing that I have said can be construed to imply that the mine foreman is responsible for the *official acts* of his assistants.

THOMAS HOGARTH.

Burgettstown, Penn.

Study Course in Coal Mining

By J. T. BEARD

The Coal Age Pocket Book

TABLE SHOWING ATMOSPHERIC PRESSURE AT DIFFERENT ELEVATIONS AND CORRESPONDING DENSITY OF AIR FOR DIFFERENT TEMPERATURES

Eleva. above or below Sea Level (Ft.)	Height of Barom. (In)	Atmos. Press. (Lb.p.sq.in.)	Mean Temp. Observed (Deg. F.)	Temperature (Deg. F.)							
				—20	0	32	60	100	200	300	400
				Weight of Dry Air (Lb. p. Cu.Ft.)							
25,000	11.343	5.571	0.0	.0342	.0327	.0306	.0290	.0269	.0228	.0198	.0175
20,000	13.874	6.814	8.0	.0418	.0400	.0373	.0354	.0329	.0279	.0242	.0214
15,000	16.948	8.323	17.0	.0511	.0489	.0457	.0433	.0402	.0341	.0296	.0262
14,000	17.626	8.656	18.8	.0532	.0509	.0475	.0450	.0418	.0354	.0308	.0272
13,000	18.328	9.000	20.7	.0553	.0529	.0494	.0468	.0434	.0369	.0320	.0283
12,000	19.053	9.357	22.7	.0575	.0550	.0514	.0486	.0452	.0383	.0333	.0294
11,000	19.805	9.726	24.8	.0597	.0571	.0534	.0505	.0469	.0398	.0346	.0306
10,000	20.582	10.107	27.0	.0621	.0594	.0555	.0525	.0488	.0414	.0359	.0318
9,000	21.392	10.505	29.4	.0645	.0617	.0577	.0546	.0507	.0430	.0374	.0330
8,000	22.229	10.916	32.0	.0670	.0641	.0600	.0567	.0527	.0447	.0388	.0343
7,000	23.088	11.339	34.8	.0696	.0666	.0623	.0589	.0547	.0464	.0403	.0356
6,000	23.975	11.774	37.8	.0723	.0692	.0647	.0612	.0568	.0482	.0419	.0370
5,000	24.890	12.224	41.0	.0751	.0718	.0671	.0635	.0590	.0500	.0435	.0384
4,500	25.360	12.455	42.7	.0765	.0732	.0684	.0647	.0601	.0510	.0443	.0391
4,000	25.837	12.689	44.4	.0779	.0745	.0697	.0659	.0612	.0520	.0451	.0399
3,500	26.322	12.927	46.2	.0794	.0759	.0710	.0672	.0624	.0529	.0460	.0406
3,000	26.813	13.169	48.0	.0809	.0774	.0723	.0684	.0635	.0539	.0468	.0414
2,500	27.315	13.415	49.9	.0824	.0788	.0737	.0697	.0647	.0549	.0477	.0422
2,000	27.824	13.665	51.8	.0839	.0803	.0751	.0710	.0659	.0559	.0486	.0429
1,500	28.339	13.918	53.8	.0855	.0818	.0764	.0723	.0672	.0570	.0495	.0437
1,000	28.861	14.174	55.8	.0871	.0833	.0778	.0737	.0684	.0580	.0504	.0445
900	28.966	14.225	56.1	.0874	.0836	.0781	.0739	.0686	.0582	.0506	.0447
800	29.072	14.277	56.4	.0877	.0839	.0784	.0742	.0689	.0585	.0508	.0449
700	29.178	14.329	56.7	.0880	.0842	.0787	.0745	.0691	.0587	.0510	.0450
600	29.296	14.387	57.0	.0884	.0845	.0790	.0748	.0694	.0589	.0512	.0452
500	29.390	14.433	57.4	.0886	.0848	.0793	.0750	.0696	.0591	.0513	.0454
400	29.496	14.486	57.8	.0890	.0851	.0796	.0753	.0699	.0593	.0515	.0455
300	29.603	14.538	58.3	.0893	.0854	.0799	.0756	.0702	.0595	.0517	.0457
200	29.710	14.591	58.8	.0896	.0857	.0801	.0758	.0704	.0597	.0519	.0458
100	29.818	14.643	59.4	.0899	.0860	.0804	.0761	.0707	.0600	.0521	.0460
Sea Level 0	**29.925**	**14.696**	**60.0**	**.0903**	**.0863**	**.0807**	**.0764**	**.0709**	**.0602**	**.0523**	**.0462**
—500	30.469	14.963		.0919	.0879	.0822	.0778	.0722	.0613	.0532	.0470
—1,000	31.022	15.235		.0936	.0895	.0837	.0792	.0735	.0624	.0542	.0479
—1,500	31.582	15.510		.0953	.0911	.0852	.0806	.0749	.0635	.0552	.0487
—2,000	32.151	15.789		.0970	.0928	.0867	.0821	.0762	.0647	.0561	.0496
—2,500	32.727	16.072		.0987	.0944	.0883	.0835	.0776	.0658	.0572	.0505
—3,000	33.312	16.359		.1005	.0961	.0899	.0850	.0790	.0670	.0582	.0514
—3,500	33.903	16.650		.1023	.0978	.0915	.0865	.0804	.0682	.0592	.0523
—4,000	34.504	16.945		.1041	.0996	.0931	.0881	.0818	.0694	.0603	.0533
—4,500	35.113	17.244		.1059	.1013	.0947	.0896	.0832	.0703	.0613	.0542
—5,000	35.730	17.547		.1078	.1031	.0964	.0912	.0847	.0719	.0624	.0551

The Coal Age Pocket Book

The table on the preceding page is deduced from the determinations of atmospheric density and pressure, under normal conditions, at different elevations above and below sea level, as established by the celebrated British astronomer royal, Sir George Biddle Airy (1840), and the aëronautic observations of Herschel and Glaisher.

The **atmospheric pressures** in the third column of the table are the mean of many direct observations taken at different altitudes, under normal conditions, and constitute what are generally known as "Airy's tables."

The **temperatures** in the fourth column correspond to the mean observed temperatures, at different altitudes and are based on a sea-level temperature of 60 deg. F. They are suggestive of the rate of cooling or fall of temperature with respect to increase of altitude. The following table shows the mean observed temperatures of the atmosphere at different altitudes, the rate of fall (deg. per 1000 ft.) and the estimated average temperature of air columns from sea level to the altitudes given:

TABLE SHOWING RELATION OF MEAN TEMPERATURE TO ALTITUDE IN THE ATMOSPHERE

Altitude or Elevation Above Sea Level Ft.	Mean Observed Temperature Deg. F.	Rate of Fall in Temperature Deg. per 1000 Ft.	Mean Average Temperature of Air Column Deg. F.
25,000	0	1.6	24
20,000	8	1.8	29
15,000	17	2.0	35
10,000	27	2.5	42
8,000	32	3.0	45
5,000	41	3.5	50
3,000	48	4.0	54
0	60	..	..

The mean average temperature of air column extending from sea level to any altitude given in the above table makes it possible to calculate the normal barometric pressure for that altitude, by means of the following formula:

$$B_h = 29.925 \left[1 \pm \frac{1}{144\,(0.37\,T)}\right]^h$$

in which

B_h = barometric pressure, at altitude h (in.);
T = average absolute temperature of air column, sea level to altitude h (deg. F.);
h = altitude above sea level (ft.).

The application of this formula requires the use of a table of seven-place logarithms or more. It serves to check the temperature observations at these altitudes.

The sign ±, in the formula, relates to the altitude h as being above or below sea level. For altitudes above sea level, the second term within the brackets is negative and the minus (—) sign must be used. For altitudes below sea level, this term is positive and the plus (+) sign is employed.

Inquiries of General Interest

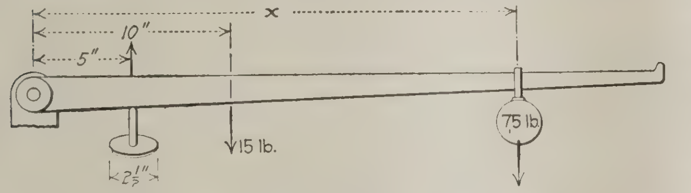
Safety-Valve Formulas

Some time ago there was answered in *Coal Age* a question relating to the lever safety valve, and the method of calculating the distance of the ball or weight from the fulcrum for any given blowoff pressure was explained. The formula took into account the center of gravity of the combined weight of the safety valve and the lever. Will you kindly give the formula for finding the distance of the ball from the fulcrum; also, the formula for finding the blowoff pressure when the weight of the ball and its distance from the fulcrum are known.

R. W. SPAULDING.

Buffalo, N. Y.

At the moment of blowoff there are three forces in equilibrium about the fulcrum as a center. The total steam pressure on the valve, acting upward, is resisted by the combined weights of the valve, lever and ball, acting downward. The moment of the upward steam pressure, with respect to the fulcrum as a center, is equal to the sum of the moments of the combined weight of valve and lever, acting downward through its center of gravity, and the weight of the ball also acting downward.



In the following formulas, let

x = Distance of ball from fulcrum (in.);
m = Distance from fulcrum to center of gravity of valve and lever (in.);
n = Distance from fulcrum to valve steam (in.);
W = Weight of ball (lb.);
w = Combined weight of valve and lever (lb.).

Then, to find the distance of the ball from fulcrum, for any given blowoff pressure:

$$x = \frac{apn - wm}{W} \qquad 1.$$

To find the blowoff pressure, for any given weight of ball and distance to fulcrum:

$$p = \frac{Wx + wm}{a\,n} \qquad 2.$$

To illustrate the use of the formulas, assume the following values as shown in the accompanying figure:

Let $m = 10$ in.; $n = 5$ in.; $w = 15$ lb.; $W = 75$ lb. Taking the diameter of the valve as 2.5 in., its area is $a = 0.7854 \times 2.5^2 = 4.9$ sq.in. Then, substituting these values in formula 1, we find the required distance from the fulcrum to the ball, for a blowoff pressure of 90 lb. per sq.in., is

$$x = \frac{4.9 \times 90 \times 5 - 15 \times 10}{75} = 27.4 \ in.$$

Again, to find the blowoff pressure when the ball is set at a distance of 20 in. from the fulcrum, we have

$$p = \frac{75 \times 20 + 15 \times 10}{4.9 \times 5} = 67.3 \ lb.$$

Anthracite Prices as Affected by Pennsylvania State Tax

Please state the circular price of anthracite, as of April, 1915, before the 50c. differential went into effect, at New York or tidewater, Boston and Buffalo, specifying the market sizes of egg, stove, nut and pea.

———, Penn. X.

In answer to the foregoing, it may be stated that the wholesale anthracite circular of Apr. 1, 1915, quoted egg and stove at $5.25 per gross ton delivered in barges, alongside Boston points, plus the Pennsylvania state tax, which in April amounted to 8c. per ton for these sizes of coal. The same circular gave the price of nut as $5.50, alongside, plus the state tax; and pea coal, as $4, alongside, plus the tax. In April, the Pennsylvania state tax on nut was 8.62c. and on pea 5.25c. per ton.

These are the net circular prices of such companies as the Philadelphia & Reading Coal & Iron Co. and the Lehigh & Wilkes-Barre Coal Co. Other companies, as Lehigh Valley Coal Sales Co.; Williams & Peters, representing the Hillside Coal & Iron Co. and other producers; Dixon & Eddy, representing the Scranton Coal Co., the Hudson Coal Co. and other shippers, all add 10c. flat to the above prices, to cover the Pennsylvania state tax. Unlike the first two companies named, they do not make a separate item of the tax as do those companies who assess their customers the same amount they pay to the state.

From the circular, the prices of egg, stove and nut advance 10c. each per month, for five months beginning May 1, so that the prices, Sept. 1 and following, are 50c. in advance of the circular prices quoted, except for pea coal, for which there is no such advance in price. While, according to the circular, the same advance applies to broken coal, it is customary to allow the April price to prevail throughout the year on this size.

The wholesale anthracite circular, April, 1915, at the lower ports of New York or tidewater, quotes the following prices: Broken, $5.05; egg, $5.30; stove, $5.30; and chestnut, $5.55 per ton. For delivery at the upper ports of New York, these prices are increased 5c. per ton to cover towing charges.

The prices for the smaller sizes of anthracite are as follows: Pea, $3.50; buckwheat No. 1, $2.75; buckwheat No. 2, $2.25; and buckwheat No. 3, $1.75, all f.o.b. The spring discount of 50c. per ton does not affect the prices of these smaller sizes of coal.

The wholesale anthracite circular, April, 1915, at Buffalo, quotes prices as follows: Grate, $5.60; egg or stove, $5.85; nut, $6.10; and pea, $4.05 per ton, f.o.b. cars.

Examination Questions

Miscellaneous Questions

(Answered by Request)

Ques.—A certain incline 1000 ft. long has a grade sufficient to accelerate the speed of a car so as to cause it to gain in velocity 1.25 ft. each second. (a) If the car starts from rest at the top of this plane, at what distance from the top will it have acquired a velocity of 40 ft. per sec.? (b) How long will it take the car to reach the bottom of the incline? (c) What will be its velocity when it arrives at the bottom of the plane?

Ans.—(a) Since the car gains 1.25 ft. in velocity each second, the acceleration is uniform and the time required to attain a velocity of 40 ft. per sec., assuming the car starts from rest, is 40 ÷ 1.25 = 32 sec. Since the acceleration is uniform, the space passed over in any given time when the car starts from rest will be the same as though it had traveled for the same time with a uniform velocity equal to one-half the velocity acquired at the end of that time, or in this case, ½ of 40, or 20 ft. per sec. Therefore the distance of the car from the top of the plane at the end of 32 sec., when it has acquired a velocity of 40 ft. per sec., is 20 × 32 = 640 ft.

(b) The time required for a car to pass over any given distance when starting from rest and moving with a uniform acceleration is found by dividing twice that distance by the acceleration and extracting the square root of the quotient obtained. Thus in this case the car will reach the bottom of the plane, a distance of 1000 ft., in 40 sec., which is found as follows:

$$t = \sqrt{\frac{2 \times 1000}{1.25}} = 40 \textit{ sec.}$$

(c) Since the gain in velocity is 1.25 ft. each second, the velocity of the car at the end of 40 sec., when it arrives at the foot of the incline, will be 40 × 1.25 = 50 ft. per sec.

Ques.—Find the acceleration due to a gravity plane when the weight of the descending loading cars is 7000 lb. and that of the ascending empty cars and rope 3600 lb., ignoring friction.

Ans.—In this case, ignoring friction, the force producing motion is the difference between the weight of the descending and ascending loads, while the total moving weight is the sum of these two loads. When a body falls freely, the force producing motion is equal to the weight of the body, and the acceleration is then 32.16 ft. per sec. But for the same mass moved, the acceleration produced is directly proportional to the force producing the motion. Hence, applying this principle in the present case, the ratio of the required acceleration to 32.16 is equal to the ratio of the difference between the descending and ascending loads to the sum of these loads, which gives for the required acceleration *f*,

$$f = \frac{7000 - 3600}{7000 + 3600} \times 32.16 = \frac{17}{53} \times 32.16$$
$$= 10.31 \textit{ ft. per sec.}$$

Ques.—Find the centrifugal force developed by the revolution of a body weighing 150 lb. when its speed of rotation is 120 r.p.m. and the radius of the circle described by its center of gravity is 10 ft.

Ans.—The centrifugal force of a revolving body is equal to twice its kinetic energy expressed in foot-pounds per second, divided by the radius of revolution in feet. In other words, the centrifugal force of a revolving body is found by multiplying the weight of the body in pounds by the square of its velocity in feet per second and dividing this product consecutively by the acceleration due to gravity (32.16 ft. per sec.) and the radius of revolution expressed in feet.

Thus in this case the velocity of the center of gravity of the body when making 120 r.p.m., or 2 r.p.s., is 2 (2 × 3.1416 × 10) = 125.66 ft. per sec. The centrifugal force of a body weighing 150 lb. and moving with this velocity is therefore

$$F = \frac{W v^2}{R g} = \frac{150 \times 125.66^2}{10 \times 32.16} = 7365 \textit{ lb.}$$

Ques.—What work is performed in hoisting a cage weighing 2600 lb. and carrying a loaded car that weighs 3400 lb., in a shaft 200 ft. deep, assuming that the friction of the hoist is one-tenth of the load hoisted and ignoring the weight of the rope?

Ans.—The total load hoisted is 2600 + 3400 = 6000 lb. Adding one-tenth for the friction of the hoist gives 6600 lb. The work performed when this weight is lifted 200 ft. is 200 × 6600 = 1,320,000 ft.-lb.

Ques.—Assuming that the track resistance on a certain haulage road is 40 lb. per ton, what horsepower of engine will be required to haul a trip of 15 mine cars on a level road in a mine at a speed of 10 mi. per hr.? Each car weighs 1800 lb. and carries 2400 lb. of coal. Assume the efficiency of the engine is 85 per cent., and ignore the weight and resistance of the haulage rope.

Ans.—The total moving load in this case is 15(1800 + 2400) = 63,000 lb., or 31.5 tons. The track resistance being 40 lb. per ton, the force required to move the loaded trip is 40 × 31.5 = 1260 lb. A speed of 10 mi. per hr. is 10 × 5280 ÷ 60 = 880 ft. per min. Then, assuming an efficiency of 85 per cent. for the engine, the horsepower required is

$$H = \frac{1260 \times 880}{0.85 \times 33{,}000} = 39.5, \textit{ say } 40 \textit{ hp.}$$

The resistance of the haulage rope, in mine haulage, is generally estimated from its weight as 40 or 50 lb. per ton.

Ques.—If rails cost $50.00 per ton, what would be the cost of the rails used in laying a single track of 16-lb. rails in an entry half a mile in length?

Ans.—A half-mile is 2640 ft. and will require 2 × 2640 ÷ 3 = 1760 yd. of rail. The weight of the rail used being 16 lb. per yd., the total weight required for this entry is 1760 × 16 ÷ 2000 = 14.08 tons, which will cost 14.08 × 50 = $704.

Coal and Coke News

Harrisburg, Penn.

Railroad men connected with the anthracite-carrying roads expressed disappointment with the decision of the Interstate Commerce Commission affecting rates of coal transportation. The decision is called unfair, unjust, and discriminating.

It appears from rough estimates, however, that the Delaware & Hudson R.R. will fare the worst. Nearly all of its coal goes to points north and northwest. The shipments do not reach tidewater. On a gross business of more than 9,000,000 tons it is estimated that the Delaware & Hudson, must lose from $2,000,000 to $3,000,000 under the new rate.

The Central R.R. of New Jersey and the Philadelphia & Reading will probably come next in the amount of loss incurred. All of the coal shipments are sent eastbound. There is a reduction of 5 cents on the rate to tidewater and of 15 cents to 35 cents to points like Elizabeth, N. J. It was estimated that the joint roads, with an anthracite shipment of 10,000,000 tons, would lose about $1,500,000 a year.

The Delaware, Lackawanna & Western will probably come next in line with a loss estimated at $1,000,000 a year.

It is probable that the Erie will also lose $1,000,000 under the new schedule. Down on the bottom of the list are the Pennsylvania and the Lehigh Valley railroads, which are expected to lose about $500,000 each. The Lehigh Valley's losses, it is thought by many, will be less than $500,000, though they have been estimated to be over $1,000,000. The Lehigh Valley is in a fortunate position, in that it ships its coal to the West for the main part, and therefore suffers the smallest reduction. Last year's anthracite shipments amounted to nearly 15,000,000 and the coal business of the road was about 56 per cent. of the total freight business.

The purpose of the Interstate Commerce Commission in ordering the reductions is to give the independent operators, who produce 20 per cent. of the total anthracite, a fair chance to compete with the railroad coal companies. If this competition becomes real and effective, the independents may be able to sell coal at a lower figure, and this reduction in the selling price of coal may react on the companies controlled by the roads.

Whether any of these results of the Federal Commission's decision will enable the ultimate consumer to buy coal at a lower rate is doubted. It is believed that most, if not all, of the reduction will be absorbed by the retail dealer. Consumers on a large scale, such as factories buying direct from the mines, may, however, be benefited to a noticeable degree.

While the decision in no way affects the Philadelphia situation, the men who have been active in supporting the fight of the State Public Service Commission in its effort to compel the roads to reduce their rates 40 cents a ton to Philadelphia are greatly pleased because they see a moral effect to result when the appeal of the railroads comes up before the Dauphin County Court on Sept. 15.

The decision of the Interstate Commerce Commission is final, according to attorneys who have studied the case. There can be no appeal, and the only hope the railroads have is in a possible rehearing before the commission. It is predicted that there will be no application for a rehearing by the railroads, at least not until the rates have been operative for some time. If it could be shown that the rates are confiscatory, an appeal to the courts might follow. If any of the roads might raise the question of confiscatory rates successfully it would be the New York, Ontario & Western and the Erie lines. These roads are described by the commission in its reference to incomes of the respondent roads as "less prosperous roads," with net incomes much lower than the net incomes of other anthracite carriers.

The consensus of opinion in the anthracite region is that the miners are in no wise afraid of the cut in the coal freight rates, because the commission of 1902 and 1903 passed upon their wages. The wage is not based on freight rates. The miners, believe, by reason of their organization, they are in a position to stand out against any reduction of wages. As the United States Courts have now virtually decreed that the coal companies must be divorced from the railroad companies, it would only complicate matters if they gave as an excuse for reducing wages the decree rendered for a reduction of freights, when the latter are not supposed to be a factor in the earnings of the coal producers.

Can Dredged Coal Be Taxed

While companies and firms engaged in handling culm or washing or dredging coal from the rivers have been filing reports with the Auditor General under the terms of the anthracite coal tax law, the point was raised on Aug. 13, by an attorney for a coal company that the coal washed or handled from banks or streams could not be taxed because there is no way of telling when it was mined. The question raised is that the act only taxes coal mined since the act went into effect.

Officials of the Auditor General's Department do not think that the point will hold and say that the act covers coal mined and prepared for market. Most of the coal dredging companies are filing reports just as are the big producers of anthracite. For the convenience of the companies having several collieries, a form of report giving summaries has been prepared.

The Railroads Are Storing Coal

All the big railroads, as well as a number of the smaller ones, are now storing coal against any contingency that may arise as a result of the heavy demand for export and the threatened shortage of labor due to return of thousands of foreign-born miners to their native lands.

For the past six months representatives of European and South American governments have been actively engaged in contracting for coal in the bituminous region. Many thousands of tons are being shipped to Baltimore, where it is loaded on ships for the continent and eleswhere.

Since July 1, the Pennsylvania R.R., the Baltimore & Ohio and the Bessemer & Lake Erie, the Buffalo, Rochester & Pittsburgh and the Pittsburgh & Lake Erie, have been accumulating a fairly large percentage of the coal mined. At all large coal storage stations of these companies hundreds of cars are arriving weekly, and the stocks at many points are beginning to assume large proportions.

That the question of labor is soon to be the biggest problem mines and other industries will have to face is evidenced on all sides. Quietly for the past six months many foreign-born miners and day laborers have departed from the western part of the state for eastern ports. The greater proportion of these men are returning to their countries to take service in the armies, but it is understood that many are also going home to work in mills and factories which are turning out supplies for their Governments.

The anthracite operators have not much fear that the war will have serious effect upon the supply of labor for their mines. Just now a good many Italians are going home, but this nationality only represents about 7 per cent. of the anthracite employees, and a large number of them are below the military age while many are now above it and many are citizens of this country. Further there is no large demand for the exportation of anthracite coal, and presumably the British order forbidding shipments of coal out of the country will not create nearly so great a demand for anthracite as for bituminous. A shortage of bituminous would naturally augment the demand for anthracite for home consumption, but these are contingencies that have not yet been given serious thought by many operators.

While the larger number of foreign employees in the coal regions of the state are from Austria-Hungary, comparatively few of these have returned to their countries owing to their inability to secure safe transportation.

PENNSYLVANIA

Anthracite

Lykens—On account of the continued slack business at the collieries of the Susquehanna Coal Co., in the Lykens Valley, more than 100 miners have quit and gone to Bethlehem where they have found employment with the Bethlehem Steel Co., which is working full time on war orders. The loss of so many men at the collieries handicaps their successful operation.

Plains—Two hundred workmen who have been on strike at the Hudson Colliery of the Central Coal Co., returned to work on Aug. 12, after officials promised them the increase in wages demanded. Forty men had gone out on strike in one of the workings, making a demand for an increase of 46 cents per day. The men made this demand on the ground of prevailing conditions and also that men in other veins were receiving that amount of pay. When the demands were refused the balance of the employees of the colliery went out in sympathy with the other strikers.

Mt. Carmel—A thousand employees of the Natalie Colliery, operated by the Maderia Hill Co., went on strike on Aug. 10, because the company announced a 10 per cent. reduction of wages in gangways and certain other work. The company says the reduction is necessary to keep the mines on a paying basis.

Fern Glen—When the employees of the Tomhicken colliery of the Hazle Mountain Coal Co. left that operation on Aug. 13, it marked its passing as an active factor in the production of anthracite coal. The men at that mine, on the 13th were informed that the no-work-tomorrow order held good until the end of time. The operation gave employment to several hundred men. During the present year, the final robbing has been in progress and the limit of production was finally reached. It is understood that the plant is to be dismantled and the equipment will be sold.

Hazleton—For the first time in 15 years the Black Creek storage plant of the Lehigh Valley Coal Sales Co. is being used. The placing of coal in that section was started on Aug. 10, when a huge train load of coal was dumped along the mountain side. The capacity of this storage plant is almost unlimited, placed as it is in an unsettled section, and presenting for use, if needed, the entire mountain side. Work has been slack during the summer, tonnage records have slumped and the company, in order to keep its equipment busy, has decided on this storage plant, it being the first time, as stated, for it to be resorted to in 15 years.

Pottsville—The dredging of coal from the Schuylkill River this summer has proceeded more extensively than ever. One firm at Glenworth, south of here, has so far this season taken 15,000 tons of coal from the river. The coal is mostly of the smaller sizes from Pea down, but the price which is obtained makes dredging profitable work.

Pittston—The value of oxygen helmets in fighting mine fires was demonstrated on Aug. 14, when a blaze that threatened extensive damage to the No. 6 colliery of the Pennsylvania Coal Co. was extinguished, without heavy loss, closing the mine only one day. The fire is believed to have been caused by a carelessly discarded match among timbers in a section of the Pittston vein where slushing was being done. The blaze spread rapidly and had a good start when discovered. A helmet gang of 10 men entered the workings and carried the line of hose right up to the blaze, extinguishing it after several hours' work. General Manager Inglis directed the fire-fighting.

Port Griffith—With the concrete foundations and coal pockets completed, the steel superstructure of the New Ewen breaker of the Pennsylvania Coal Co., at Port Griffith, replacing the breaker destroyed by fire last January, is being erected and the "model" breaker will be finished by Jan. 1, 1916. Every piece of machinery in the plant will be electrically driven, marking another step in the Pennsylvania company's plan to electrify its entire system.

Scranton—Work on driving a bore hole some 250 ft. deep into the workings of the Peoples Coal Co. was recently begun. As soon as this bore hole is completed, the city, through the Department of Public Works, will begin flushing the worked out areas with ashes, clay and similar material. Ten to 12 tons of material per hour will be passed through the bore hole and nearly six city blocks will be thus supported.

Bituminous

Charleroi—Hazelkirk mine No. 2 of the Pittsburgh-Westmoreland Coal Co. recently resumed operation after a suspension of several weeks. The Dunkirk mine of the same company was also started shortly afterward. Both of these mines have been put in shape for a long and steady run, as heavy orders have been received.

Charleroi—The Ellsworth teams took first place in the open and closed first aid events at the miners' first aid demonstration of western Pennsylvania at Eldora Park recently. Ellsworth No. 1 team made a perfect score in the open event while in the closed event the Ellsworth No. 2 team did nearly as well, getting a percentage of 99. The rank of the teams contesting were as follows: Open event, first Ellsworth No. 1, second Gallatin No. 3, third Vesta No. 4 team. In the closed event the winning teams ranked as follows: First Ellsworth No. 2, second Toms Run, third Gallatin No. 3. Between 4000 and 5000 miners and their families witnessed the first aid contests.

Greensburg—Increased demand for coal for export and unusually large orders from the Northwest are causing considerable work in the Youghiogheny Valley. The Darr Mine at Jacobs Creek, belonging to the Pittsburgh Coal Co., is being put in shape for operation. Between 400 and 500 men will be employed at this mine which has been idle for the greater part of the year.

Banning—The No. 3 mine of the Pittsburgh Coal Co., which has been closed down for over a year, will shortly begin operation. The tipple has been overhauled and the entire mine made ready for a resumption of work.

McClellandtown—Under the supervision of James H. Hoover, the 120 beehive ovens upon which work during the past few months has been in progress, will probably be completed some time next month. Construction of these ovens was begun some years ago, was delayed from time to time but will be pushed from now on. Seventy-four ovens of the type of those being built are now in operation.

Uniontown—The rumor is current that the Stewart coke works of the Stewart Iron Co. is to resume operation. This rumor has been denied. Improvements have been made to the tenement houses during the past few weeks but operations are said not to be under contemplation. These works have been idle for over a year.

Roscoe—Operations were recently resumed at the Eclipse mine of the Pittsburgh Coal Co., 400 men being employed. A new steel tipple was put into use. The mine is one of the largest in the Roscoe section.

WEST VIRGINIA

Fairmont—It was recently announced that every mine of the Consolidation Coal Co. in commission this year is in full operation, and furthermore that sufficient orders are in evidence to keep these plants going full time for at least four months. Coal operators throughout the entire local field are decidedly optimistic.

Putney—The mines of the Campbells Creek Coal Co. have closed down for an indefinite period. About 300 miners and mine laborers are affected by the suspension of these operations.

Williamson—A marked demand for a high-grade domestic coal during the past 12 months has led operators into investing nearly $2,000,000 in improvements and developments of coal mines in the Thacker section. Several new mines are now producing high-grade domestic and steam coals. An electric power plant has also been constructed by the Crystal Block Coal Co., which will furnish current to many of the towns and mines along Tug River.

ALABAMA

Birmingham—Taking advantage of the increased rail rate to New Orleans, the river mines of Alabama are planning to make huge improvements, with the view of supplying New Orleans with river coal at a much lower figure than can the rail business. The Pratt Consolidated Coal Co. and the Alabama & New Orleans Transportation Co. already have fleets of steel barges plying between New Orleans, Mobile and the mines, and have many additional barges under construction. It is announced that the Tennessee Coal, Iron & R.R. Co. has closed a contract with the Alabama & New Orleans Transportation Co. to barge coal to New Orleans, approximating 10,000 tons per month, which coal will be loaded at the Maxine mines. Many smaller mines are opening up along the river.

Tuscaloosa—The Gilmore mines on the Warrior River near Tuscaloosa will resume operations shortly after being suspended several months. The output will be sent to Mobile and New Orleans to be used on ocean-going vessels.

KENTUCKY

Louisville—Bondholders of the Continental Coal Corporation operating mines in southeastern Kentucky, have until Aug. 25 in which to file their consents to the proposed trust agreement by which interest on the company's bonds will be reduced from 6 to 3 per cent. for the next two years. It is understood that the Louisville Trust Co., with which the trust agreement has been filed, has received consents from bondholders whose holdings aggregate $1,400,000, while the needed amount to be represented is said to be $1,650,000 or 80 per cent. of the total outstanding issue. The date named is an extension from Aug. 10.

Lexington—C. J. Norwood, state inspector of mines, and dean of the college of Mines and Metallurgy at the State University, has issued announcements of a series of examinations for mine foreman's and fire boss' certificates, which will be held here on Aug. 23. To be admitted to the examinations it is necessary to pay a fee of $2.50 to the State Auditor at Frankfort.

Typo—The Harvey Coal Co. with offices at Knoxville, Tenn. has started coal mining in the new mines on First Creek and will be ready to begin shipping coal within the next 30 days when the new First Creek Branch railroad is ready for traffic. Track laying has been going on for some time.

Hazard—The Lexington & Eastern R.R. states that coal shipments are rapidly increasing in the Hazard field, and that more coal is now going out over the L. & E. than at any other time in the history of the development of the territory. The road is being taxed to handle the heavy shipments. It will be necessary to add a number of new trains.

OHIO

Glouster—The letting of the contract of the Ohio State University at Athens to a West Virginia concern has occasioned much criticism here, as this fuel has been furnished for some time by the Bailey Run mine, near Jacksonville. The contract was let this year on a strictly competitive basis, and went to West Virginia in consequence.

Athens—Repair work has been started on mine No. 254 at Jacksonville, near here, with a view to placing it back in operation, after a lapse of a considerable time. The work will cost several hundred dollars, and it is expected that the mine will be producing within a short time.

Amsterdam—Employees of Mine No. 2 of the Ohio & Pennsylvania Coal Co. have been notified that the mine would be placed in full operation soon. In the past few weeks the mine has been operated several days weekly.

Blaine—The strike at the Blaine mine of the Lorain Coal & Dock Co., which affected about 400 miners, has been settled and the men have returned to work. The men walked out because their demand for two check weighmen was refused by the operating company. The company will try to enforce the fine of $1 per day per man, contained in the wage scale which was recently agreed to.

INDIANA

Sullivan—The J. Woolley Coal Co., Evansville, has leased the Midland mine near here and will begin operations Sept. 1. The Cloverleaf mine will also resume operations. Superior mine, No. 10, has increased its working force.

Boonville—The Indiana Workmen's Compensation law goes into effect Sept. 1. The Big Four Coal Co., which has a mine near here, has posted notices that it will not operate under the law but will stand upon its rights in court.

ILLINOIS

Shiloh—Four mules belonging to the Southern Coal and Mining Co., after surviving for years the perils of life underground in the Shiloh mine of the company, were killed by lightning the day after they were raised to the surface. The mules were no longer needed underground and were hoisted and turned into a pasture. The next day there was a violent storm and a tree under which the animals had taken shelter was struck and all four were killed.

Springfield—A tentative plan for the distribution of the $26,000 appropriated by the general assembly for the relief of the families of miners killed in the Royalton mine disaster, Oct. 27, 1914, has been worked out by the State Board of Administration. The money, with the exception of $1000 to defray the expenses of administration, will be prorated among the survivors. Fifty-five families will be beneficiaries. These include 80 children. Allotments will be made to one miner who was injured and to two who went insane as a result of the disaster. Each widow will receive $15 a month as long as the fund lasts. For each child under 14 years of age she will receive $5 a month. Orphans will receive the same amount as would be paid the family were the mother living. It is estimated that under this system the money will last about two years. The largest amount will be paid to Mrs. Mary Smiddie. She has 9 children, of whom 6 are under 14 years of age. She would receive $45 a month. The plan is the same as was adopted in disbursing the Cherry Mine relief fund.

Belleville — A foreclosure suit was filed in the Circuit Court here recently against the Vulcan Coal & Mining Co., William Winkelman, P. J. Gundlach and E. F. Ackerman, administrator of the estate of the late Jacob Gundlach. The proceeding is brought by the Belleville Bank & Trust Co. and George Hippard, president of the Hippard Coal Co. A foreclosure order on the property of the Vulcan company is asked under a $50,000 mortgage and various notes signed by the Vulcan company and the other defendants and held by the plaintiffs.

Winkle—Nine men have been arrested in connection with an alleged attempt to blow up with dynamite the mine of the Granger Coal Co. and it is expected that three other men will be arrested. Discovery of the alleged plot was made Aug. 13. Sheriff J. Quinn, of Charleston received information from a negro that the tipple and surface property of the mining company was to be destroyed. Eighty sticks of dynamite were found hidden in a shaft. The Granger mine has been the scene of trouble several times since last February. It has arisen out of the attempt of the Granger company and a faction of miners to operate the mine on a coöperative basis. Another faction of unionists has opposed this effort. The mine was formerly known as the old Chime mine. Last February a coöperative company was formed by 150 men and the mine was worked on a coöperative basis for some time. Then there was a disagreement and the Granger company was organized. The pump house and fan house were recently destroyed by fire of unexplained origin.

Carlinville—A decision of great importance to coal men was handed down here Saturday, Aug. 14, by Judge Frank Burton in the Macoupin County Circuit Court in the case of the Superior Coal Co. against the Ohio Oil Co., the Louis H. Miller Oil and Gas Co. and G. P. Fleegler and others, involving the question whether oil and gas companies have the right to bore through coal beds. The decision is that work may be continued on wells that have been begun by the defendant companies but that new wells may be bored on lands of the Superior Coal Co. only on condition that they will not be nearer than 900 ft. to coal workings, shall not be closer than 600 ft. to each other and not more than three wells shall be bored on each 40-acre tract. Five days' notice must be given the coal company of the location of new wells. Except as to these provisions the temporary injunction obtained by the coal company two weeks ago is dissolved. As to these provisions the injunction is only suspended and may be invoked if any of the conditions are violated. The Superior Coal Co. has leases on 44,000 acres of coal around Staunton and Dorchester, Ill. Recently oil and gas were discovered in the vicinity and a boom developed. The company saw in the sinking of many wells a source of damage and danger and appealed to the courts for relief. The question had never been raised in Illinois before and attracted a great deal of attention. The decision is not entirely pleasing to either side and it is probable that the question at issue will be carried to the highest courts. In the meantime the decision of Judge Burton will govern operations on the Superior Coal Co.'s lands.

COLORADO

Golden—At the suggestion of the newly appointed president of the Colorado School of Mines, Dr. William B. Phillips, the board of trustees has formally created the chair of "safety and efficiency engineering." It is planned to give instruction that will assure the utmost safety in coal as well as metal mining.

Hastings—The Victor-American Fuel Co. has recently put all its coke ovens into service for the first time in over a year.

PERSONALS

Charles S. Kehler, formerly with the Puritan Coal Co., will on and after Sept. 1 represent as sales agent C. C. Corey of Detroit. H. H. Le Bel will also be a sales agent for the same firm.

E. W. Coates, formerly Indiana representative of the Peacock Coal Co., of Columbus has been assigned to cover central Ohio territory. His place in Indiana has been taken by H. W. Fitzgerald.

Thomas H. Stoneham, of Boston Hills, for several years division inside foreman of the Delaware & Hudson Coal Co., has been advanced to the position of general superintendent of the Plymouth district.

Hugh D. Pallister has resigned as assistant professor of mining at the Pennsylvania State College to accept the position of professor of geology and mining at the School of Mines of the University of Texas.

T. B. Shockley, for some time Superintendent of the Oklahoma Coal Co., will on Sept. 1 next become General Superintendent of all the mines for the Oklahoma Consolidated Coal Co. This firm will be one of the largest operating concerns in the Southwest.

V. C. Hillabold has purchased an interest in the Madison Coal Co. which was recently taken over by a syndicate operating a number of coal companies along the Ohio River. Mr. Hillabold will succeed Frank Vawter at the local office while Mr. Vawter will take another post with the company.

W. E. Thomas, cashier of the Bridgeport Bank & Trust Co., has been appointed Referee in Bankruptcy for Belmont County for the Fort Pitt Coal Co., which was recently forced into involuntary bankruptcy. Mr. Thomas expects to take no immediate action looking to the disposition of the property.

T. Coleman du Pont, who recently disposed of his interests in the du Pont de Nemours Powder Co., was a recent visitor in Louisville, Ky., which was his home for many years. He also went on to Central City where he inspected the properties of the Central Coal & Iron Co. in which he is still interested.

Secretary B. F. Nigh of the Michigan-Ohio-Indiana Coal Association recently returned from a speaking trip which took him to Vincennes, Richmond and Indianapolis, Ind. During his two weeks traveling he has taken more than 30 new members into the organization and finds the interest is increasing in association activities.

W. R. Fairley, representing the federal government and who was sent to Kansas to probe the labor situation in the mining district there and find the reason why 1200 miners were without work is now investigating the case of the Sheridan Coal and Mining Co. as a side issue and he will probably send a report to his department on this case. He has not yet visited the strip pits, which are said to be the cause of the miners being without work, but, will do so soon.

OBITUARY

J. C. Boyle, president of the J. C. Boyle & Son Coal Co., Sparta, Ill., died at his home at Sparta, Tuesday, Aug. 10, at the age of 85 years. Entering the mining industry late in life, after his fortune, built up as a member of the banking firm of Borders & Boyle, had been wiped out, he became one of the leading coal operators of his section. It was in 1884 that the bank failed. In 1887 Mr. Boyle sunk a small shaft near Sparta. He did not have money enough to equip the mine and at first he hoisted coal with an old blind horse. He obtained business in the neighborhood and from Sparta and in a short time was able to buy a team of mules, with which he delivered coal in person to the people of Sparta. In the course of a few years he was able to equip the mine with engine, boiler and hoisting apparatus. By building a macadamized road from the mine to the city limits he was able to practically control the coal business of the city. He was successful and leaves a well-equipped mine which, since his retirement, has been conducted by his son, who will continue to operate it.

INDUSTRIAL NEWS

Baltimore, Md.—The purchase of land in the northern section of Baltimore has led to the rumor that the Baltimore & Ohio R.R. plans laying out a large coal storage plant at that point.

Lorain, Ohio—Thirty-one thousand, one hundred and eighty-nine tons of coal were recently loaded into vessels over the dock of the Baltimore & Ohio R.R. at Lorain. This is believed to be a record for the Great Lakes of tonnage handled by one machine.

Philadelphia, Penn.—The Swedish steamship "Norbotten" left here recently with one of the largest cargoes of bituminous coal that ever left for a foreign port. She carried a tonnage of 8434 tons, which was valued at $22,382.40, and was destined for Stockholm.

Knoxville, Tenn.—A miners' annual field day first-aid meet will be held Saturday, Sept. 18, at Coal Creek, under the auspices of the Tennessee Mine Foremen's Association. The teams are being coached by J. M. Webb, officer in charge of the local mine rescue station. Over 37 teams are expected to enter the contest.

Philadelphia, Penn.—The coal shortage in France is becoming more apparent since British exports are to be shut off, as is indicated by increasing inquiries to local shippers. It is reported that of the 89 coal mines in France all but 9 are in the control of the Germans, and coal in France has already reached a price of $25 per ton.

Huntington, W. Va.—It is stated that the deal by which the Main Island Creek Coal Co. was to be taken over by the interests which control the United States Coal & Oil Co. has not yet been consummated, but that the outcome of the pending negotiations may be expected within a short time. Option on the company's property has been extended.

St. Louis, Mo.—J. E. Rutledge, of St. Louis, president of the New Staunton Coal Co., and the Nokomis Coal Co., has awarded a contract to the Roberts & Schaefer Co., of Chicago, for the designing and building of two miners' bath houses of hollow tile construction 70x24 ft. complete with the bath water heating equipment, lockers, showers, etc., which will be built immediately at these companies' mines at Nokomis, and Livingston, Illinois.

Minneapolis, Minn.—Preparations for starting the new plant of the United States Steel Corporation at Minneapolis in September are well under way. Coal has been shipped to the plant and the byproduct ovens have been fired with a view to thoroughly drying out their linings prior to the manufacture of coke. Cargoes of limestone and coal have been started from lower Lake ports and are now on their way to Duluth. It is expected that the plant will be in operation early in September.

Washington, D. C.—Officials of practically all the bituminous coal-carrying roads joined with many operators in a statement filed with the Interstate Commerce Commission recently, asking the Commission to fix the differentials between the various rates on soft coal from Ohio, Indiana, Kentucky and West Virginia mines to the Great Lakes. The Commission will take up this request this fall. The roads and operators are pledged to abide by the decision of the commission which is asked to fix the differences so all the roads may reach common points of consumption on a fair and equitable basis.

Trenton, N. J.—Judges Buffiington and McPherson have filed with the clerk of the United States District Court the recent decision of the United States Supreme Court enforcing the separation of the Delaware, Lackawanna & Western Coal Co. from the Delaware, Lackawanna & Western R.R. This filing of the decision is a legal formality that becomes necessary because of the fact that the decision of the Supreme Court was based on appeal from the decision of the court of this district and which the Supreme Court reversed. As a matter of fact the separation of the companies had taken place some weeks before the filing of the decree.

Louisville, Ky.—Local operators who have been advised that the Interstate Commerce Commission has upheld the proposed increase in rail rates from mines and coke ovens in Alabama, Illinois, Kentucky and Tennessee to Mississippi river crossings and various junction points in Tennessee, Mississippi and Lousiana, are of course disappointed. They had hoped that the commission would not allow the increase. It is stated that at least some of the western Kentucky operators feel that they will be at a disadvantage on account of the advance, which they opposed as well as Memphis and other valley town business interests. The river coal operators, however, are said to feel that they have gained a real advantage.

Donaldsonville, La.—The West Kentucky Coal Co.'s towboat "Gleaner," the third largest towboat on the Mississippi River, recently created a record when it brought a tow of 35 barges of coal to Donaldsonville, having made the trip from Paducah, Kentucky, in 8 days 3 hr. The tug recently was purchased by the West Kentucky Coal Co. for service in the harbor at Memphis. In the 40-day interval between the arrival of the "Gleaner" at this port on her last trip down the river, 31 barges of coal were unloaded at the Port Barrow station to fill orders booked by R. N. Sims, state manager of the company. The number of loaded barges now on hand is the largest that ever has been assembled in a local fleet, and perhaps the largest on the Mississippi between Memphis and New Orleans.

Philadelphia, Penn.—A number of interesting facts may be gleaned from the annual report of the Lehigh Valley Coal Co. for the fiscal year ending June 30, 1915: Production of anthracite lands owned and leased, including tenants, was 8,088,901 tons, an increase of 211,511 tons. The increase was all in the first six months of the fiscal year; the second six months shows a decrease. The percentages of sizes larger than Pea produced by the mining operations of the company was 65.41 per cent., a decrease of 1.05 per cent. A complete spray system was introduced at each of the frame breakers and as a result of tests made under observation of representatives of insurance companies, a substantial reduction was made in premiums paid for insurance. Included in the cash on hand is the sum of $678,085, representing the amount set aside on account of the special tax levied by the State of Pennsylvania of 2½ per cent. of the value of the coal mined, which amount is being held pending the decision of the courts as to the legality of the act. The working hours for the year were 42,085, an increase of 867 hours.

Coal Trade Reviews

General Review

Readjustment in anthracite freights creates uncertainties in the trade. Indications of a firmer tone in bituminous. Negotiations on permanent contracts in Europe. Lake trade fails to make any improvement. Middle Western consumers showing some interest in contracts.

Anthracite—All attention in anthracite circles is concentrated upon the new rate decision and its probable effect upon the trade. At the moment it has created a hesitancy throughout the market; orders are being held up in all directions pending a thorough analysis of the decision and as a result the current business has relapsed into probably the dullest stage of the summer trade. Although shippers aggressively deny the rumors of low prices, well informed buyers are making no pretense whatever of paying more than the April circular, with the possible exception of on some special coals.

General idleness prevails throughout the retail trade, and indications point to aggressive competition when the fall business opens up.

Eastern Bituminous—The trade is apparently steadying up, probably in anticipation of the impending fall business; there is less tendency to cut prices while operators are more resolute in restricting shipments. The improvement is confined more particularly to the steam grades which are acting in sympathy with the better outlook in manufacturing circles, where a great deal is anticipated by fall. Blocks of cheaper coal are occasionally noted on demurrage though these are usually moved without any severe cutting. What consumers have failed to close so far, continue holding out for special inducements.

Exports—Heavy orders continue coming in, in spite of almost prohibitive freight rates and a scarcity of bottoms. It is possible that there is even enough of this off-shore business now in sight to justify the opinion that the Atlantic coastwise market will be sustained at the present level, at least. American representatives in foreign countries are said to be making rapid headway in negotiations on permanent contracts, while inquiries on this side are coming through such responsible intermediaries as to leave little doubt as to the authenticity of the business. The movement over the Hampton Roads piers has been lighter during the past week, but there is a great deal of vessel tonnage due that will clean up the accumulation.

Lake Markets—Both the Lake and general manufacturing demand in the Pittsburgh district show a slight increase and mine operations are at a trifle better rate, while indications point to an improved demand although it will probably be slow. Urgent solicitation is necesssary to shake out orders and buyers are still cautious, but there are probably less reports of coal on demurrage. The market is a shade firmer and operators are stiffer in their views as to contracts running to Apr. 1. The Connellsville district continues moving a relatively large tonnage to the seaboard for export. The Canadian trade remains flat and shows no indications of reviving. The heavy rains and consequent curtailment in buying through the rural districts have again slowed up domestic buying in Ohio.

Middle Western—Negotiations on future business are showing some activity, especially from the Northwest, but orders have slowed up since the increased circular went into effect on the first of the month, most dealers having apparently met their current requirements on the July basis. It is apparent that many buyers have been holding off in anticipation of still lower prices, but the market is holding in a most impresssive manner, considering the general scarcity of orders. The recent light operations in the mining districts have caused a heavy exodus of miners and in event of the expected rush for coal materializing this fall, the operators are facing a possible shortage of men. Crops are delayed and have not yet become much of a factor in the situation.

A Year Ago—Business uncertainties have created a sharp buying movement in anthracite. The derangement in coastwise and foreign shipping has seriously disturbed the Eastern bituminous situation. Sales agencies aggressively investigating the possibilities in the foreign markets. Sentiment generally better.

BUSINESS OPINIONS

Boston News Bureau—Banking opinion continues to be focussed solely on the international exchange situation. The low market price of the British sovereign is checking business between the American and foreign merchants. To get this regulated is the need of the hour. Great Britain must have our products and it requires credit. At the moment the United States dollar is the standard and it must be so recognized. When we look at our economic position we are bewildered at our strength. We are not only burdened with money but are facing an enormous addition to our wealth from the soil. It is a waiting proposition, waiting for the consummation of the English loan.

American Wool and Cotton Reporter—The wool market for the last week was active, with scoured wool especially in demand. This was brought about by big army orders. In fact, there was a good general demand for all wool. The wool situation is stronger than for two years. Practically all offerings in woolen and worsted goods are available in the men's wear market, and the situation is favorable. The past week is considered one of the busiest at any opening period in a number of years. There is every indication of a prosperous season.

Iron Age—There is no let-up in the new inquiry for steel for the warring countries, and with each week the percentage of mill output that will be shipped abroad in some form is increasing. The evidence that this export business will continue for months on the present or a greater scale counts largely in the predictions of further broadening of the industry. Russia's Bessemer rail purchases are large and more are to come. The Steel Corporation now has 65,000 tons of this business, which will be rolled at the rate of 1000 tons a day at Chicago, and is more than welcome in giving employment to bessemer capacity in all the rush for open-hearth steel.

The Southern Lumberman—Basic conditions in the yellow pine industry continue to show improvement. Price advances shown in lists issued Aug. 1 are generally holding. There is no disposition on the part of the mills to force stock on the market; as a matter of fact, surplus stocks in first hands are not large enough to warrant sacrifices even where quick sales and in large amounts can be effected. A steady and fairly satisfactory summer business is being done in hardwoods. Buying continues to be in small lots, but is of very good volume in the aggregate.

Dun—Overshadowing several significant developments of the week the Government crop report is the strongest single factor operating for sustained business progress. Practical assurance of agricultural success was the one thing needed to make the future secure, and important undertakings will be prosecuted with increased vigor now that bountiful harvests are officially promised. Prosperous conditions on the farms are essential to national welfare.

Bradstreet—Enlarged house trade, country-wide optimism, smarter activity in metal manufacturing, further slight improvement in lines that have long lagged, heavier buying of pig iron at advanced prices, relatively excellent crop news, war orders that overflow regular channels to plants not heretofore engaged in that respect, better collections, increased calls for money with which to move crops, some, though not satisfactory, relief in the way of higher freight rates for Western railroads, a heavy influx of gold to help bolster weak rates for foreign exchange, which are at new record low levels, and sustained public interest in the stock market, comprehend the chief features of the week's developments.

Marshall Field & Co.—Although there have been fewer merchants in the market than a year ago, reports from those in indicate an optimistic feeling for excellent retail business this fall. Current wholesale distribution of dry goods has not been as satisfactory as that of the corresponding week a year ago, due in a large measure to adverse weather conditions throughout the country. Collections continue satisfactory.

ATLANTIC SEABOARD

BOSTON

Fewer concessions reported on Pocahontas and New River, and market is a trifle firmer. Slight demand for Pennsylvania grades and Georges Creek is in fair request. Water freights unchanged. Anthracite rather dull until September.

Bituminous—While there are no striking developments in the Pocahontas and New River trade it is plain there is less inclination to shade prices f.o.b. and the market as a whole is that much improved. Shipments to New England have not increased any and neither has the demand, but there is a little bracing up among the agencies as if to be in better position for fall business. Export orders are holding out fairly well and operators show a rather more resolute attitude about keeping output down to what the market will absorb.

On new business trade is at a standstill. The few buyers who have not yet placed contracts are still holding out for inducements. There is enough off-shore business in sight, however, at least to sustain the present price level, and if any notable bargains are had it will probably be on grades outside of Pocahontas and New River. Most shippers of the latter coals are doing a comprehensive business, even though New England is not contributing a very heavy share of it.

The Georges Creek shippers continue to send large tonnages off-shore, and the outlook is equally good for September. The demand here is so light, however, for spot coal that the occasional cargo that is not to be applied to contract is hard to sell. The Pennsylvania grades, especially those best known, are securing some new business here from time to time. Prices are as low as in any recent season and where the Hampton Roads shippers are more or less rigid as to price there is frequently an opening for small gains in tonnage.

Water Freights are quiet, with no special change in quotations. There is always a supply of bottoms particularly on the part of shippers with tonnage under charter which they cannot use themselves. Barges are freely quoted at 40c., New York to Long Island Sound ports. It is beginning to be felt that some of the sailing vessels now off-shore will be back in the coastwise trade by November and if that is the case they will have a tendency to keep freights on about the present range. The Philadelphia & Reading Transportation Line lost the barge "Knickerbocker" in the storm the week beginning Aug. 8.

Anthracite—Trade is waiting for stocks to move to the consumer. When that movement is on in earnest, in September, there will be a fair amount of business. There are predictions of an active fall market and the publication of the demands of the mine-workers is already causing retailers to consider the possibilities for next April. A few are quite strong in their disposition to take coal on this fall as fast as they make room.

Bituminous prices at wholesale are about as follows:

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines*	$0.85@1.40	$1.15@1.60	$1.67@1.77	
Philadelphia*	2.10@2.65	2.40@2.85	2.92@3.02	
New York*	2.40@2.95	2.70@3.15	3.22@3.32	
Baltimore*	....	....	2.85@2.95	
Hampton Roads*	....	....	....	$2.70@2.85
Boston†	....	....	....	3.55@3.68
Providence†	....	....	....	3.45@3.68

* F.o.b. †On cars.

NEW YORK

Interest of anthracite agencies centered on the possible effects of the rate decision, and negotiations delayed. Offshore business the only active branch of the bituminous trade. Some companies making permanent foreign connections.

Anthracite—The chief topic of conversation in anthracite circles this week is the decision of the Interstate Commerce Commission and the effect it will have on the trade generally. That the decision in some of its salient points is unfair seems to be the concensus of opinion. President L. F. Loree, of the Delaware & Hudson Co., stated that according to the terms of the decision his company will be affected more seriously than any of the other coal-carrying railroads. The action of the stock market alone on Friday morning was indicative of the public's interest in the matter.

Locally, shippers believe that the decision will cause continued dullness through September. They argue that consumers will await the results of the new order, anticipating a benefit, and that September tonnage will suffer accordingly.

Tidewater shipments have been light during the week. Very little coal is being brought down excepting on firm orders. The few purchases made by the retailers are limited largely to egg and stove in the domestic sizes and rice and barley in the steam grades. There seems to be no demand for chestnut while pea sales are very seldom noted. Buckwheat and the smaller sizes are moving freely on regular contracts and the individuals with high grade coals are obtaining good prices on them.

Each day or so brings new inquiries for export. Several samples have been dispatched and the prospective purchasers after making tests and deciding upon the correct size will probably place their orders. Most of the inquiries are for chestnut.

The average quotations of the week follow:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$4.95		$5.00	
Egg	5.20@4.70	$4.90@5.20	5.25	$5.00@5.25
Stove	5.20	5 00@5.20	5.25	5.00@5.25
Chestnut	5.45	4 85@5.45	5.50	5.10@5.50
Pea	3.50	2.90@3 15	3.50	2.75@3.00
Buckwheat	2.75	2.00@2 25	2.80	2.05@2.30
Rice	2.25	1.70@1.85	2.30	1.75@1.90
Barley	1.75	1.45@1.70	1.80	1.50@1.75

Bituminous—There is not so much coal at the piers, the operators preferring to restrict operations at the mines and bring the coal down to Tidewater as business requires. It is true that blocks of some of the cheaper grades are standing from time to time but efforts to move this tonnage usually meets with success when shipper and consumer get together. Concessions of from 5 to 15c. are the medium through which this is accomplished.

Freights to Continental, Mediterranean and Northern ports continue to rise if anything as time goes on and when foreign consumers require the fuel they will pay the price. Even so it cannot be said that there is much hesitancy about the purchase after the inquiry falls into the shippers' hands. Rates to Italian and other Eastern Mediterranean ports for instance have advanced to 40 and 45 shillings, but bottoms are scarce. Available vessels of 2500 to 7500 tons' capacity are quickly chartered at the prevailing rates. Where sales of 3000 tons or less are made and no vessel of less than 4000 tons is obtainable the order is usually cabled back to proceed on that basis so that shippers have benefited in this way.

It is said that the representatives of several well-known concerns now in European countries have done well toward pushing American coal and have established connections which may lead to permanent relations.

Current quotations are on the following basis:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.20@3.30	$3.20@3.30	$3.20@3.30	$1.75@1.85
Georges Creek Tyson	2.90@3.00	2.90@3.00	2.90@3.00	1.35@1.45
Clearfield:				
Medium	2.65@2.80	2.55@2.65	....	1.10@1.25
Ordinary	2.55@2.60	2.55@2.60	....	1.00@1.10
Broad Top Mountain	....	....	....	1.10@1.45
Cambria County:				
South Forks	2.90@3.05	....	....	1.35@1.50
Nanty Glo	2.75@2.80	....	....	1.20@1.25
Barnesboro	2.65@2.70	....	....	1.10@1.15
Somerset County:				
Quemahoning	....	2.70@2.85	2.70@2.85	1.20@1.30
Medium	2.65@2.70	2.60@2.65	2.60@2.65	1.10@1.15
Latrobe	2.45@2.55	....	....	.90@1.00
Greensburg	2.75@2.80	....	....	1.10@1.15
Westmoreland	3.15@3.20	....	....	1.35@1.45
West Virginia Fairmont ¾		2.60@2.70	2.60@2.70	.80@ .90
Fairmont mine-run	....	2.40@2.50	2.40@2.50	.70@ .80
Steam	....	2.45@2.50	2.45@2.50	.90@ .95
Western Maryland	....	2.35@2.40	2.35@2.40	.80@ .85

PHILADELPHIA

Anthracite very dull, with low prices the rule. Stove most active, with little demand for any other sizes. Pea is a little firmer. Bituminous slow locally, but brisk at tide. Slack coal continues scarce.

Anthracite—Business has not improved the past week and just now has probably fallen back into the lowest summer level. A slight improvement may be expected during the last few days of the month, but there are close observers who believe there will be no real activity before the end of September, and then the improvement will be gradual. The real trouble is there is too much coal above ground and all concerned know it.

No well informed buyer is paying higher than the April circular except for some special coals, though many of these orders are placed in the spring and the price protected until Oct. 1. This may be contradicted here and there, but that will only evidence a desire to protect the shipper, who is anxious to keep the lowest prices confidential.

Dealer trade is completely flat. It is feared by some of the more substantial dealers that the low prices at which coal was bought during the summer and spring will have an ill effect on the early fall retail trade. After the season of inactivity, some dealers in their anxiety to secure business, will overlook the opportunity to recoup and start price cutting. As bearing particularly on this phase of the situation, two large dealers in the Kensington district, where the price cutting raged disastrously last winter, state that they intend to actively engage in the struggle this fall if the same tactics are used.

Stove is still the most active, with egg in fair demand, and chestnut continuing to accumulate with practically no sales at all. Pea continues to stiffen, due essentially to the fact that some independent operations having contracted for their entire output on this size until late into the fall have really no coal to offer. However, no one is buying at an advanced price.

The recent decision of the Interstate Commerce Commission ordering a reduction in the Tidewater rates seems to meet with the approval of the retail dealers generally, and also the independent operators. Of course the lowering of the tide rates will not directly affect the local or line trade, but the opinion is general that there must certainly be some adjustment to place them on a parity. As a matter of fact the State Public Service Commission almost a year ago ordered a drastic reduction in the line rates, but they have not as yet become effective, an appeal having been taken by the railroads.

The current circular prices, to which the Pennsylvania State tax of 2½% must be added, are as follows:

	Line	Tide		Line	Tide
Broken	$3.40	$4.65	Pea	$2.50	$3.25
Egg	3.65	4.90	Buckwheat	1.25	2.25
Stove	3.90	4.90	Rice	.85	1.75
Chestnut	4.05	5.15	Barley	.50	1.50

Bituminous—The dullness in the domestic trade is slightly offset by the increased demand caused by the commercial revival, which it is expected will almost amount to a boom by the time winter comes. The export trade continues to grow and the inquiries from abroad are increasing daily. Many of these inquiries are coming from responsible intermediaries in this country who guarantee payment, and for this reason quite a number of concerns who have never entered the export trade are quoting prices on the inquiries.

The only fluctuation in price during the past week has been in slack coal, which also showed an increase the previous week. This slight scarcity of slack is due to the lack of demand for the three-quarter size.

The prices during the past week have been about as follows:

Georges Creek Big Vein	$1.6[illegible]@1.75	Fairmont gas lump, mine-run	$1.15@1.25
South Fork Miller Vein	1.50@1.60	Fairmont gas, slack	.70@ .80
Clearfield (ordinary)	1.00@1.20	Fairmont lump, ordinary	.85@ .95
Somerset (ordinary)	1.00@1.15	Fairmont mine-run	.75@ .80
West Va. Freeport	.85@ .95	Fairmont slack	.55@ .65

BALTIMORE

The ear-marks of better times are stamped at every hand. Coal prices are stiffening, and the movement growing. Industrial wheels are humming in earnest.

The mining sections report an increasing tonnage movement, and there is a tendency among producers to hold for better prices. During the week slack moved upward, and was strong at 60 and 65c., against sales not many weeks back of 30 to 35c. Coke too is showing 10 to 15c. advances over prices of a couple of weeks ago, and is held more strongly both in West Virginia and Pennsylvania.

Best western Maryland coals were strongly held, spot prices for Georges Creek big vein being around $1.75 as a rule and for Tyson around $1.35. South Fork was bringing about $1.35; while Clearfield was offered at from $1 to $1.05. Lower grade Pennsylvania coals were offering at from 90 to 95c. West Virginia Freeport was offering at 80 to 90c., and Fairmont three-quarter at 85 to 90c.

Export business continues brisk. During the past week a total of 22,527 tons was loaded at Curtis Bay and Port Covington for foreign ports. Bunker fuel taken by these carriers totaled 3403 tons.

HAMPTON ROADS

Export movement still holding up well. Fair amount coal going coastwise. Prices remain unchanged.

There has been some large export cargoes moving from Tidewater and a fair coastwise business. There has also been some coal loaded into colliers for the Government and bunker vessels have been supplied with a reasonable quantity, ranging from 300 tons to as high as 1400 or 1500 tons, according to the size of the vessel and her foreign destination. As is always the case the New England ports have taken practically all of the coastwise movement.

The demand during the week has not been quite so heavy and there is some little accumulation on the railroads which will, however, be greatly reduced during the coming week as considerable vessel tonnage is due to take care of contracted coal. Prices on the various grades supplied at Tidewater remain practically unchanged.

Railroad Tonnages—Dumpings over the local piers for the past several weeks compare as follows:

	Week Ending				
Railroad	Aug. 14	July 10	July 17	July 24	July 31
Norfolk & Western	171,252	174,822	180,090	197,913	188,593
Chesapeake & Ohio	83,390	76,397	116,862	96,627	84,018
Virginian	63,066	57,467	78,710	86,523	39,335
Totals	317,708	308,686	375,662	381,063	311,949

OCEAN FREIGHTS

A large number of steamers have been chartered to carry coal to Mediterranean, South American and West Indian ports during the past week, and while rates to the Mediterranean and to the West Indies are unchanged, rates to South America are weaker. This weakness applies at present only to steamers available within the next 30 days, the general impression being that the competition of grain from here will stiffen the market after this period.

The freight market is now quotable as follows:

To	Rate	To	Rate
Havana	$2 75@3 25	Bermuda	**$3.00**
Cardenas or Sagua	3.00@3.50	Vera Cruz	3.25@3.75
Cienfuegos	3.25@3.50	Tampico	3.25@3.75
Port au Spain, Trinidad	3.50	Rio	8.16@8.28
St. Lucia	3.25@3.50	Santos*	8.40@8.64
St. Thomas	3 00	Montevideo	**7.86**
Barbados	3.50	Buenos Aires or La Plata†	**7.92**
Kingston	3 00@3.50	Rosario	**8.28**
Curacao	3.25	West Coast of Italy	9.36
Santiago	3 25@3.50	Barcelona**	8.40@8.64
Guantanamo	3 25@3.50	Valparaiso or Callao	6.50@7.00
Demerara	4.50@5.00	Marseilles	8.64@8.88

Note—Rates noted in **bold face** type are only approximate.

* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British steamers; neutral steamers are more difficult to obtain and the rates are always higher.

W. W. Battie & Co.'s Coal Trade Freight Report.

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	To	Tons	Rate
Rio Preto	Rio Janeiro	2612	
Thorsa	Cardenas	683	
Crescent	St. John, N.B.	400	$1.90
Daisy Farlin	St. John, N.B.	385	
E. E. Briry	Fort de France	1408	
A. & M. Carlisle	St. John, N.B.	302	1.90
Nordbotten	Narvik	8000	
Jupiter	Marseilles	3217	

BALTIMORE

Vessel	To	Tons	Rate
Southwaite[1]	River Plate	2333	8.28
Rosina	River Plate	1600	8.28
Camilla	Bocas del Toro	1530	
Lovland	Banes[2]	1463	
J. E. Drake	Mayport	789	
Zurichmoor[1]	Italy	2422	9.48
Evandale[1]	Italy	2468	9.36
Teviotdale	Italy	2538	
Luigi	Italy	2260	
Georgios	Italy	5000	
Shawnut	Mayport	1100	
Jean	Mayport	2391	
Castlemoor	Alexandria	2404	

Or Virginia[1] and Preston[2].

VIRGINIA (Including Hampton Roads)

Vessel	To	Tons	Rate
Penlee	Port Military	2451	8 88
Winnebago	Rio Janeiro	2718	8.28
Southwaite[1]	River Plate	2333	8.28
Rosina[1]	River Plate	1600	8.28
Andijk	Taltal	4017	7.00
Penhale	River Plate	2330	8.16
Ronald	River Plate	1835	8.22
Winlaton	La Plata	2059	7.98
Queenswood	Rio Grande	1694	10.20
Erviken	Rio Grande	1344	
Zurichmoore[1]	Italy	2422	9.48
Warren	River Plate	2359	8.16
Penare	River Plate	1793	8.28
Evandale[1]	Italy	2468	9.36
E. S. Embricos	River Plate	2670	8.28
L. M. Lau	Bangor	1154	1.00
Confield	Rio Grande	1718	10.20

Or Baltimore[1].

ATLANTIC RANGE

Vessel	To	Tons	Rate
Southport	Marseilles	2305	8.88
Monginevro	Italy	3334	
Tharos	Italy	2139	9.60
Ulrik Hohn	San Fran.	930	4.85

Note—Steamers are indicated by **bold face type**, all others being schooners.

VESSEL CLEARANCES

The following steamers have cleared from Hampton Roads Aug. 6 to Aug. 13.

NORFOLK

Vessel	Destination	Tons
Siljestad[1]	Buenos Aires	5867
Singleton Palmer[1]	Lisbon	3993
Adriatico[2]	Savona	6500
Agnello Ciampa	Civita Vecchia	4600
Liv	Buenos Aires	3907
Miliades Embiricos	Genoa	4004
Strathalbyn	Dakar	6650
Stephen[3]	Para	2029
Deddington	Buenos Aires	3564
Republic	Pernambuco	1172
Carlo	Gibraltar for orders for Italy	7700
Venus	Gibraltar for orders for Italy	5150
Penare	Buenos Aires	4297
Dunstin G. Gressy	San Juan	1600

NORFOLK

Vessel	Destination	Tons
Rosalia L.	Naples	10,000
Orpheus	Spezia	6700

NEWPORT NEWS

Vessel	Destination	Tons
Angrolina[4]	Spezia	5000
Galveston	Cardenas	1700
Tharros	Spezia	4230
Robt. H. McCully	Puerto Plata	950
Nikolaos	Marseilles	7000
Maud	Chaparra	3250
Francis	Para	716
Erroll	Rio de Janeiro	3350
Pennine Range		5500

Castner, Curran and Bullitt[1]. Pocahontas Fuel Co.[2]. C. and O. Coal and Coke Co.[3] New River Coal Co.[4].

Note—Steamers are indicated by **bold face type**, all others being schooners.

LAKE MARKETS

PITTSBURGH

Slight further improvement in demand, and operations somewhat better, at 55 to 60% of capacity. Prices firmer, particularly on contract.

Lake shipments have increased slightly and the iron and steel trade is consuming a trifle more coal, though the increase is not marked since the steel plants have been running practically at capacity since early in July. General manufacturing demand shows a slight increase. The Pittsburgh district mines are operating at a little better rate, at between 55 and 60% of capacity. Prospects are that demand will continue to improve, although perhaps slowly.

The market as a whole is a shade firmer; gas slack for prompt shipment now commands about 60c., an advance of 5c. in the week, while steam slack is usually to be picked up at about 50c. Operators are stiffer in their views as to contracts running to Apr. 1 and are usually quoting $1.15 on mine-run, although $1.10 can be done, this comparing with $1.05 until lately. The Connellsville regions continue to make fairly heavy shipments of coal for export, but the Pittsburgh district proper has been unable to participate in the movement, on account of its higher costs.

We quote the market for free coal as follows: Slack, 50@60c.; nut and slack, 90@95c.; nut, 95c.@$1; mine-run, $1@1.05; ¾-in., $1.10@1.15; 1¼-in., $1.20@1.25, per net ton at mine, Pittsburgh district. On contract to Apr. 1, slack, 95c.; mine-run, $1.10@1.15; ¾-in., $1.20@1.25.

BUFFALO

Some stir in bituminous, with promise of more. Slack the best feature. Less demurrage coal. Prices slightly stiffer. Anthracite not moving. Prospect of a rush in the fall.

Bituminous—The trade improves at a slow rate, though there is enough added activity to give promise of something good in the fall. Business of any sort is not expected to be active in August. There is evidence of a larger need of manufactured goods and that alone will create some demand. At one time it seemed as if consumers bought only on the urgent solicitation of sellers but it is a trifle different now, though the improvement is not large. The Canadian trade is not in business to any great extent and shows no indication of improving. Buffalo sells considerable coal there, so that the business here feels the effects of the light demand acutely.

Prices are a little stronger week by week but continue on the basis of $2.70 for best Pittsburgh lump, $2.55 for three-quarter, $2.45 for mine-run and $2.25 for slack. There has been some special dullness in Allegheny Valley slack, but sizes are about 25c. lower than Pittsburgh as usual.

Anthracite—Shipping agents are devoting most of their time to estimating the amount of shortage to be made up when the fall season sets in. There is little doubt that average sales will be made then if they cannot be made now. There is no increase in the movement of anthracite, but it is expected that the demand will improve before the end of the month and possibly it will continue, as there are certainly shippers who have not yet come into the market.

Regular quotations of anthracite, f.o.b. Buffalo are $5.60 for grate, $5.85 for egg and stove, $6.10 for chestnut and $4.05 for pea, per gross ton. From this maximum price a reduction of 10c. per ton is made during August. The prices include the Pennsylvania tax.

The shipments of anthracite from this port are still less than at this time a year ago on account of the congested state of the upper-lake docks. For the week the total was 131,500 tons.

TORONTO, CAN.

Approach of fall stimulates some activity in the market. Slack a trifle stiffer.

Some improvement in trade has been noted during the last two weeks, as many consumers are laying in stocks of anthracite in anticipation of the usual fall increase in prices. The demand for bituminous continues light, with some stiffening in the price of slack owing to the falling off in the call for lump coal on the Upper Lakes. Foundry coke is also firmer. Quotations for best grades of coal are as follows: Retail, anthracite, egg, stove and nut, $7.50; grate, $7.25; pea, $6. Bituminous retail steam, $5.25; screenings, $4.25 to $4.50; domestic lump, $6; cannel, $8; wholesale f.o.b. cars three-quarter lump, $3.56; screenings, $3.

CINCINNATI

Continued improvement in domestic demand is the most encouraging factor. Prices steadier. The steam market not strong.

A slightly improved call for the domestic grades from all districts is noted during the past week, though it is by no means as yet up to a normal volume. However, it is one of the best indications in the market, showing that retailers are beginning to realize the necessity of securing their usual stocks.

A sympathetic improvement in the steam market is looked for, though consumption does not warrant a statement that the market is any stronger. However, it seems certain that buying on the part of large consumers will approach something like a normal volume soon, and if this is the case steam grades will benefit.

COLUMBUS

Domestic trade continues slow, but there is better buying of steam sizes. The price list is fairly well maintained. Future prospects appear brighter.

The coal trade in Ohio has remained fairly quiet. The domestic buying shortly after Aug. 1 has dropped off until domestic lines are somewhat weak. Stocking is not as active as was expected and this has a bad effect on trade conditions. The rural sections are apparently not buying as much as formerly, due to the continued rains which interfered with the work of farmers.

Steam business shows more activity all along the line. Buying for manufacturing purposes is better and those having contracts are taking a larger tonnage. There is not as much cheap steam coal offered as formerly owing to restriction of shipments when the coal is not sold. Railroads seem to be taking a larger tonnage, and some of the trunk lines are storing to guard against an emergency.

In Lake trade there is not a great deal moving. Congestion on the docks of the Upper Lake ports still continues and the movement to the interior is slow. As a result shipments from Ohio fields to the head of the Lakes are not large. But on the other hand there is a good tonnage of West Virginia coal moving to the Northwest. During the week ending Aug. 13 the Toledo docks handled 104,000 tons.

One of the best features is the continued demand for anthracite. Local jobbers report a much better demand than usual for that variety. Coke is also showing some activity.

Mines have been working at about the following percentages of full capacity:

	Week Ended					Week Ended			
District	July 24	July 31	Aug. 7	Aug. 14	District	July 24	July 31	Aug. 7	Aug. 14
Hocking....	25	15	25	25	Cambridge.	25	30	30	35
Jackson....	20	20	20	20	Masillon...	25	25	25	30
Pomeroy ..	40	35	25	40	Eastern O..	55	50	30	55
Crooksville.	20	20	30	30					
					Average..	30	29	30	33

CLEVELAND

Coal receipts the first of the week almost double those of any week the last two months. Prices showed a decided weakness.

Something over 400 cars of coal arrived here over Sunday; 80% of this was slack and slack prices showed a marked decline. Pan handle was sold at $1.50 while No. 8 went at the same price though a week ago it was 5 to 10c. higher. It is the general opinion that fine coal will be off another 5c. before the week is over. More than half the receipts were carried over.

It seems that operators watch this market very closely and all elect to ship their surplus into Cleveland at one time. Such has been the case about every six to eight weeks all summer and spring. The absorbing power of the Cleveland market has been overestimated and is now practically exhausted by the large amount of coal on track.

The Lake trade shows no indication of any change until the grain crop begins to move next month. Lake iron ore sales are being made and while the tonnages are small, the aggregate is large. Furnaces using Lake Superior ores seem to be rounding out stocks and needing more than it was thought they would.

Quotations for shipment to jobbers are as follows:

	Pocahontas	Youghiogheny	Fairmount	Bergholz	Ohio No. 8
Lump............	$3.70			$2.30	
Lump, 6-in........				2.30	
Lump, 1¼-in.......				2.10	$2.10@2.15
Lump, ¾-in.......		$2.15@2.20	$2.00	2.00	2.00
Egg.............	3.70			1.95	
Mine run.........	2.70	2.10@2.15	1.90	1.85	1.80@1.85
Slack...........		1.55	1.70	1.50	1.50

COKE

CONNELLSVILLE

Furnace coke still in the dumps, but foundry coke in better demand. Much erection of byproduct ovens. Production and shipments slightly decreased.

The coke market has shown no general improvement, prompt furnace coke being still available at $1.50 while there is scarcely any inquiry for contract furnace coke, but foundry coke is moving much better and prices are a shade firmer. Hopes are still entertained that the furnace coke market will advance sharply later in the year, but there is no very definite basis for such expectations. The coke market has not advanced while steel products have been advancing steadily for seven months and pig iron has been advancing sharply in the past 30 days. Sufficient reason for the failure of coke to advance is found in the heavy increase in byproduct coking capacity in the past couple of years, evidently causing the total capacity to be far in excess of requirements, and within the past two months work has been started, or definitely projected, on six additional byproduct plants, to have a total capacity of 1,500,000 tons or more a year.

Prompt furnace coke is offered rather freely at $1.50, despite the fact that some of the merchant ovens have lately curtailed output. On contract coke the market is not clearly defined, there being so little inquiry, but operators would no doubt sell at $1.65 or $1.70 for shipment to Oct. 1, the usual asking prices for shipment to Jan. 1 being $1.85@2. Foundry coke is moving more freely and prices are firm despite the softness in furnace coke. Quotations are: Prompt foundry, $2.20@2.60; contract foundry, $2.30@2.60, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Aug. 7 at 366,840 tons, a decrease of 10,570 tons, and shipments at 369,725 tons, a decrease of 3457 tons.

Buffalo—There is still a good movement, with the tone of the market much better than it has been for a long time. New ovens are reported in operation at coke-producing centers, having been started up to meet the increased demand. The fact that the steel and iron orders received at the furnaces are gaining on them is sufficient reason for the movement of coke. Prices are firm on the basis of $4.25 for best 72-hr. Connellsville foundry and $3.30 for stock coke.

Chicago—Gas house coke has been quiet, and the demand for byproduct sizes has been steady at slightly better prices. Foundries in the Chicago district have not as yet purchased one-half of their requirements, but during the past week some disposition has been shown to buy coke ahead. Quotations are as follows: Byproduct, $4.75@5.10; Connellsville, $4.75; Wise County, $4.65@4.75; gas coke, $3.75@3.90; furnace, $4.85.

Birmingham—The demand for furnace coke is rapidly increasing, due to many furnaces, which have been idle for the past 12 months, going into blast. The Sloss Sheffield recently put in their Florence furnace and their City furnace at Birmingham, and the Tennessee Coal, Iron & R.R. Co. have recently blown in their No. 4 furnace. The starting up of these furnaces called for a large tonnage of coke, and the West Blossburg ovens of the Sloss Co. and the Brookside ovens, both batteries having been idle since last October, have recently been put into blast, as well as the Virginia ovens of the Gulf States Steel Co. at Virginia City, which will be again blown in within the next few days. The inquiry for foreign shipments of furnace coke is quiet, though 72-hr. foundry coke is finding a fair market.

SOUTHERN MARKET

LOUISVILLE

Approach of the stocking season gradually forcing buyers into the market. Market steadier than for some weeks.

With half of August gone and the period when stocking operations have become imperative, business is showing improvement, though not at the rate hoped for. The industrial requirements are not yet as great as they should be, but the demand in both quarters is better than for weeks. The farmers are selling off enough of their crops to meet their obligations. Cotton gins and seed presses are taking their supplies in the South and there is some strengthening of the call in other directions.

Prices have not been much stimulated as yet, however, and continue on the same basis as for some weeks.

BIRMINGHAM

Outlook better than for past two years. Production steadily increasing.

Not for the past two years have conditions been as favorable for a steady market on both lump and steam coal. Additional furnaces are being blown in nearly every week, which takes a large tonnage off of the regular market; as a result operators are finding much less trouble to move their output, which is steadily increasing. If the improvement continues, the next 60 days will see conditions normal, and all mines working to practically full tonnage for the first time in two years.

MIDDLE WESTERN

GENERAL REVIEW

Trade remains nearly stationary. Increased prices check smokeless orders. Western screenings unchanged. Anthracite trade flat.

None of the Illinois and Indiana shippers express themselves as believing any improvement has been shown in the situation the past week, and some have found conditions a little less to their liking than earlier in August. The only marked change is the present sluggishness of West Virginia smokeless coals.

The ordering since the first of the month has been very slow at the increased August prices, apparently most of the dealers having met their current demands on the July basis. Difficulty in distribution of grades is noted; sometimes the lump market being too strong, and again the slack market forging ahead. Some trouble is experienced in marketing coarse smokeless sizes because suitable equipment is not available. Many wholesalers are predicting that towards the latter part of the month higher prices will prevail for Western coarse coals.

Indiana and Illinois mines as a rule are still operating at about half time or a little better, and very few of them have been fortunate enough to obtain sufficient business to place their mines on anything near a full time basis. A number of inquiries have been made by telephone and telegraph by the Northwestern trade during the last week; the buyers seemed to be endeavoring to cover future requirements.

Prices generally are still well maintained in spite of the dearth of orders. It is apparent that a large proportion of the retailers and household buyers have been withholding the purchase of their usual summer supplies in the hope that prices would break, as is usually the case, but they have been badly disappointed this season.

Threshing is still backward and this has had on unfortunate effect on the forwarding of domestic coals. Screenings are torpid and generally being sold around 60c., with some of the Indiana product having a lower freight rate to the more important points of distribution selling at 5c. to 10c. higher.

CHICAGO

Generally firmer tone to the market for Middle Western coals. Retailers stocks less than normal. Railroads still taking minimum tonnages. Eastern grades slow.

Fine coals from Franklin and Williamson County have been a little stronger recently, and while domestic buying has lagged, most of the operators are optimistic that the $1.75 price will prevail after Sept. 1. Some orders have been taken for shipment of domestic sizes during the balance of the month to retailers at $1.60. There is a firm tone in southern Illinois coals, and the tonnage is slowly increasing every day. Buyers of screenings from southern Illinois mines are apparently waiting for the usual drop in prices of former years, but will likely be disappointed this season. Carterville washed coals are in strong demand.

Some improvement is noted in the call for Springfield coals, and it is expected domestic egg and lump will be advanced 15c. very shortly. Railroads are still only taking their minimum requirements from the Springfield and Peoria districts.

A little improvement is noted in the tonnage of Indiana mine-run for the Chicago market, but shipments are much less than usual for this time of the year. Domestic lump is selling at from $1.40 to $1.50, while some of inferior quality is going at from $1.30 to $1.35. The Indiana retailers have smaller stocks on hand than ordinarily at this season of the year, and when they begin to demand shipments it is certain that they will have to have coal in a hurry. Very little Clinton and Sullivan County coals have been moving to Chicago. Knox County operators have been shipping steam coal mostly. Higher prices prevail for screenings in Indiana than in the Chicago market, the difference being about 10c. per ton.

Buying of smokeless on Chicago tracks is very slow, and a few sales have been made of prepared sizes at a discount of as high as 50c. under the August circular. Egg seems to be the weakest size. Circular prices for Pennsylvania smokeless have not been raised as yet; the demand for lump and egg has been steady, while nut is slow. West Virginia mine-run is firm at $1.40. Splint is improving in the West, probably due to better demand at the seaboard.

Some Hocking is being shipped to Northwestern points via the Lakes, but the tonnage is considerably less than in previous seasons. All-rail Hocking is being very slowly absorbed by the retailers and farmers.

Millers Creek advanced on Aug. 15 to $2.25 on 4-in. block, $1.85 on egg, and $1.55 on nut; the other eastern Kentucky coals are not affected and prices still cover a wide range.

Anthracite trade is languid. Some of the retailers have a good amount of hard coal on hand, although not the stocks of previous years. It will take colder weather to bring about a replenishment. The dilatory attitude of a large number of dealers who will wait until the last minute before ordering anthracite is continuing to have an unsatisfactory effect on the volume of shipments to Western points.

Quotations in the Chicago market are as follows:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump	$1.35@1.75	$1.25@1.50	$1.35@1.50	$1.25@1.50	$1.40@1.50
Steam lump	....	1.15@1.25	1.15@1.30	1.15@1.25	....
2½ and 3-in. lump	1.35	..	1.25@1.35	1.25@1.35	1.25@1.35
1¼-in. lump	..	1.25	1.25	1.15@1.25	..
Egg	1.35@1.60	1.25@1.35	1.15@1.25	1.10@1.20	1.15@1.30
Nut	1.35@1.60	1.15@1.25	1.00@1.10	1.00@1.10	1.00@1.05
No. 1 washed	1.35@1.50	....	1.50	....	....
No. 2 washed	1.35@1.50	....	1.40	....	....
No. 1 nut	1.35@1.75	....	....	....	....
No. 2 nut	1.35@1.60	....	....	....	....
Mine-run	1.10@1.25	1.00@1.10	.85@1.00	.90@1.00	.85@1.10
Screenings	.70@ .85	.65@ .75	.65@ .70	.60@ .70	.70@ .80

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.35@1.50	$1.30@2.00	$2.15@2.25	$1.40@1.65	$1.35@1.55
1¼-in. lump	1.20@1.25	1.25@1.50	....	1.25	1.25@1.32
Egg	1.35@1.50	1.10@1.35	2.15@2.25	1.35@1.50	....
Nut	....	.85@1.15	1.75	1.25@1.35	1.15@1.05
No. 1 nut	1.35@1.50	....	1.40	....	....
No. 2 nut	1.25@1.35	....	..	..	....
Mine-run	1.10@1.25	.95@1.10	1.40@1.50	1.25	1.25
Screenings	.65@ .75	.50@ .75	....	....	....

Lake Receipts—Receipts by Lake for the week ended Aug. 10 and for the season, this year and last year, were as follows:

	1915		1914	
	Hard	Soft	Hard	Soft
Buffalo	19,731	10,868	32,646	5,780
Toledo	......	8,800	......	7,765
Oswego	......	......	2,298	......
Cleveland	......	....	......	11,125
Sandusky	......	10,020	......	
Week's total	19,731	29,868	34,944	24,670
August total	47,280	85,256	90,576	56,099
Season total	426,679	312,496	392,288	392,407

INDIANAPOLIS

Chicago demand for Indiana coal improved; 80c. obtainable both there and in the open market for screenings. Movement of domestic grades improves. Retailers advance price of anthracite and Pocahontas.

Indiana coal operators note an improvement in the market at Chicago, where they always expect to sell a large tonnage. Screenings are selling there at 80c., which is considerably higher than the prevailing level for several weeks. The same figure is obtainable in the open market.

The weather continues against farm operations and the small marketing of wheat and oats has not made any increase in the railroad demand for coal. While the factories having war orders, mainly iron and steel plants, are consuming coal heavily, other industries show no increase. Indianapolis retailers have made the first of the usual season advances in prices, raising anthracite and Pocahontas 25c. a ton. The present schedule is:

	Per Ton		Per Ton
Linton No. 4 forked	$3.00	Pocahontas forked lump	$5.75
Indiana lump, forked	2.75	Pocahontas shoveled lump	5.25
Indiana lump and egg, screened	2.50	Pocahontas mine run	4.25
Kanawha lump, forked	4.25	Pocahontas, nut and slack	3.75
Ohio Hocking lump, forked	4.25	Anthracite chestnut	8.00
Ohio Hocking, washed egg	4.50	Anthracite stove and egg	7.75
Kentucky lump	4.50	Anthracite grate	7.50
Ohio Jackson lump, forked	5.00	Connellsville coke	6.00
Blossburg smithing	5.50	Indianapolis by-product coke (all sizes)	5.50
Cannel lump	6.00		

ST. LOUIS

Slight improvement in some districts. Orders for domestic grades coming in.

The market situation, as regards the inner group of mines, has improved slightly during the past week. Dealers are beginning, at last, to order domestic coal and lump particularly is moving more freely. The prices, however, are practically the same as last week. In the Southern Illinois field the market is about the same.

The quotations at the end of the week were:

	Wilm. & Frnk. Co.	Sparta	Mt. Olive	Standard
6-in. lump	$1.35@1.40	$1.25	$1.40	$1.00
2-in. lump	....	.95	1.25	.90
3-in. lump	....	....	1.25	....
3x6 egg	1.35@1.40	....	....	.90
No. 1 nut	1.25	....	....	....
No. 2 nut	1.10@1.15	....	....	....
No. 1 washed	1.50	....	1.40	....
No. 2 washed	1.25	....	....	....
No. 3 washed	1.25	....	....	....
No. 4 washed	1.20	....	....	....
No. 5 washed	.80	....	....	....
Screenings	.55@ .60	.60	....	.60

PRODUCTION AND TRANSPORTATION STATISTICS

VIRGINIAN RAILWAY

Shipments of coal over the Virginian Ry. for the month of June amounted to 301,932 net tons.

NORFOLK & WESTERN RY.

The following is a statement of coal handled by the N. & W. Ry. during July and the past four months in short tons:

	April	May	June	July
Pocahontas Field	1,163,948	1,259,992	1,493,776	1,648,551
Tug River District	285,243	322,881	348,737	361,454
Thacker District	245,887	278,775	238,688	265,743
Kenova District	112,076	90,642	81,794	80,009
Clinch Valley District	138,970	144,576	155,689	146,911
Other N. & W. Territory	3,271	2,323	3,418	2,651
Total N. & W. Fields	1,949,395	2,099,189	2,322,102	2,505,319
Williamson & Pond Creek	55,311	84,086	75,573	86,949
All other railroads	195,845	251,339	282,790	262,177
Grand total	2,200,551	2,434,614	2,680,465	2,854,445

FOREIGN MARKETS

GREAT BRITAIN

Aug. 6—This has been a broken week in the coal industry, and although every effort has been made to curtail the holidays in view of the urgent need of this country and our Allies for every ton of coal which can be produced, operations at the pits were not fully resumed in all cases until Wednesday or Thursday, some of the miners delaying their return to work until then. The majority of the men responded to the appeals made to them, however, and it is believed that the output has now been restored to its normal level. Perhaps the most important event of the week in the trade has been the issue of the expected announcement that the shipment of coal to our Allies is to be controlled by the Exports Committee. The new Order in Council comes into operation on Aug. 13, and has naturally been the subject of much discussion in coal-shipping circles. It is feared that business with France, Russia and Italy may be hampered to some extent by delays in issuing licenses; but on the other hand, it can hardly be the intention of the Government to seriously interfere with the total exports of the allied countries, who rely so largely upon us for their supplies.—"The Iron and Coal Trades Review."

Aug. 6—The new Government order prohibiting the export of coal to all destinations other than British possessions and protectorates, except under license, has had a rather unsettling effect on the market and business is on very quiet lines. Quotations are nominally as follows:

Best Welsh steam	Nominal	Best Monmouthshires	$7.20@7.44
Best seconds	Nominal	Seconds	6.96@7.20
Seconds	$7.44@7.86	Best Cardiff smalls	5.40@5.52
Best dry coals	7.44@7.86	Cargo smalls	4.44@4.80

Freights—Chartering is very slow at present because of the new restrictions. Rates are nominally as follows:

Gibraltar	$3.24	Naples	$4.08	St. Vincent	$4.32
Marseilles	3.48	Alexandria	4.80	Rio de Janeiro	6.24
Algiers	3.82	Port Said	4.80	Monte Video	5.76
Genoa	4.08	Las Palmas	4.08	River Plate	6.00

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

+Indicates contracts regarding which official information has been received.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

+No. 854—Tompkinsville, N. Y.—Bids have been received on this contract (Vol. 7, p. 1085, Vol. 8, p. 115), which provides for furnishing the Lighthouse Service with coal, as follows:

Schedule No. 1	Base Price	Delivery Buckets	Adj. Price per Million B.t.u.
Whitney & Kemmerer	$3.55	$0.34	$0.14
Weston Dodson & Co.*	3.50	.34	.127
W. P. W. Haff	3.49	.36	.14
Commercial Coal Co	3.74	.37	.139

Schedule No. 2	Base Price	Delivery		
		Buckets	Bags	On Deck
Weston Dodson & Co.*	$5.30	$0.34	$0.50	$0.40
W. P. W. Haff	5.51	.36	.58	.50
Commerical Coal Company	5.54	.55	1.50	1.50

Schedule No. 3	Base Price	Delivery		
		Coal Shed	Bags	On Dock
F. H. & A. H. Chappell Co.*	$6.45	$0.20	$0.60	$0.50

Schedule No. 4	Base Price	Delivery		
		Coal Shed	Bags	On Dock
Pinniger & Manchester*	$7.25	$0.75	$0.40	$0.40
Newport Coal Co	7.50	.80	.45	.45

Schedule No. 5	Base Price	Delivery			Adj. Price per Million B.t.u.
		Bunkers	On Deck	Bags	
Willard Brothers	$2.90	$0.10	$0.02	.....	$0.094
Weston Dodson & Co	3.05	.20	.20	.30	.097
Empire Coal Mining Co	2.92	.10	.03	.....	.093
W. H. Bradford & Co*	2.79	.10	.02	.15	.088
Hetherington& Co	2.84	.....	....	.....	.091
W. P. W. Haff	2.87	.29	.29	.29	.091
C. J. Wittenberg	2.84	.10	.03	.10	.091
Commercial Coal Co	3.00	.30	.30	.75	.10

Schedule No. 6	Base Price	Delivery, Coal Bin	Adj. Price per Million B.t.u.
Richmond Ice Co.*	4.75	1.10	.156

Note—While the delivery price of $1.10 per ton is in excess of 10 + of the base price per ton, as mentioned in paragraph 31 of the specifications, it is not considered that the delivery charge is excessive, for the reason that all of this coal has to be delivered by truck to the General Lighthouse Depot, which method of delivery is much more expensive than the methods by which the coal called for under the other schedules is to be delivered. The acceptance of this bid is therefore recommended.

Schedule No. 7	Base	Delivery			Adj. Price per Million B.t.u.
F. H. & A. H. Chappell Co.*	$3.70	$0.35	$0.25	$0.35	$0.126

Schedule No. 8	Base Price	Delivery			Adj. Price per Million B.t.u.
		Bunkers	On Deck	Bags	
Pinniger & Manchester*	$5.25	$0.40	$0.40	$0.40	$0.176
Newport Coal Co	5.40	.45	.45	.45	.183

* Recommended for acceptance.

Address Lighthouse Inspector, Tompkinsville, N. Y.

+No 873—Springfield, Mo.—Six bids have already been submitted on this contract (Vol. 7, p. 1086), which provides for furnishing the local Board of Education with approximately 1400 tons of screened Kansas lump coal. No definite date has apparently been set for making the awards, but it is anticipated it will be soon. Address Secy. Edw. J. Hoffman, Bd. of Edu., Springfield, Mo.

+1032—Cleveland, Ohio—The bids on this contract (p. 115), which provides for furnishing the Board of Education with coal during the ensuing year, have been opened, and tests are now being conducted of the samples furnished by the bidders. The contract will probably be awarded within a few weeks. Address Dir. of Schools F. C. Hogen, School Headquarters, Rockwell Ave. and East Sixth St., Cleveland, Ohio.

+1064—Joliet, Ill.—This contract (p. 116), which provides for furnishing the Washington St. plant of the city Water Works and the Fire and Police Department with coal, has apparently been readvertised on two separate occasions, the first bid being requested for Aug. 2, while the latest has again moved the date up to 2 p.m., Aug. 23. A certified check for $100 must accompany each bid. Address City Clk. Henry W. Odenthal, Joliet, Ill.

+1068—New York, N. Y.—Bids have been received on this contract (pp. 117, 243, 283), which provides for furnishing the Department of Docks and Ferries with approximately 1500 tons of egg coal, as follows: Pattison & Bowns, $5.33; W. P. W. Haff, $5.33; Gavin Rowe, $5.51. An insufficient deposit accompanied the bid of W. P. W. Haff, so that it could not be considered. No announcement of award has yet been received. Address Dock Com. R. A. C. Smith, Pier A, North River, New York.

+1118—Uniontown, Penn.—This contract (p. 158), which provides for furnishing the various schools of Perry Township with coal during the ensuing year, should have been noted under Uniontown instead of Connellsville, as appeared in the previous item. Address Secy. J. R. Martin, Bd. of Edu., Uniontown, Penn.

New Business

+1253—Stanley, N. D.—The Board of County Commissioners of Montrail County will receive sealed bids until 2 p.m., Sept. 7, for furnishing and delivering coal as required at the County Court House during the ensuing year. All bids must be accompanied by a certified check for $100. Address County Audr. H. P. Duggan, Court House, Stanley, N. D.

+1254—Bowling Green, Ohio—The Board of Education at this place received bids until noon, Aug. 17, for furnishing and delivering Jackson and Hocking, straight lump and three-quarter lump, as may be required during the ensuing year; bids will also be received on West Virginia splint and Pocahontas coal. Address Clk. George W. Fearnside, Bd. of Edu., Bowling Green, Ohio.

+1255—Ft. Benton, Mont.—The Trustees of School District No. 1 received sealed bids until 6 p.m., Aug. 14, for furnishing 200 tons of mine-run or nut coal to be delivered in the basement of the schoolhouse as required. Bidders are required to state what mine they propose furnishing the coal from and location of same. Address Clk. Ezra L. Crane, School Dist. No. 1, Ft. Benton, Mont.

+1256—Atlantic City, N. J.—The Board of Education at this place usually contracts for its fuel requirements some time during September. The tonnages required and the prices at which the business was done during last year were as follows: Pea, 1000 tons, $4.36; stove, 500 tons, $6.24; egg, 500 tons, $6.20. Deliveries are to be made as required. Address Board of Education, Atlantic City, N. J.

+1257—Watertown, S. D.—The Board of County Commissioners will receive bids until 2 p.m., Sept. 7, for furnishing and delivering approximately 90 tons of Pocahontas smokeless lump coal. Address County Audr. J. S. Johnson, Bd. of County Comrs., Watertown, S. D.

+1258—Angola, Ind.—The Indiana Utility Commission usually contracts some time in September for its annual requirements of coal, amounting to 2200 or 2400 tons. Cambridge, Ohio, coal is being used on the current contract, the cost of which is as follows: Freight, $1.35; coal, $1.10; unloading, 12½c.; total, $2.57½. Address Indiana Utility Commission, Angola, Ind.

1259—Denver, Colo.—The Colorado Power Co. usually contracts for its annual requirements of coal, amounting to 5000 tons of lignite and semibituminous slack, some time in September. The coal usually costs 60c. to 80c. at the mine, and the business is not generally let on competitive bids. Coal from Leadville and Salida, Colo., is used. Address Purchasing Agent, Colorado Power Co., Denver, Colo.

1260—Louisville, Ky.—The Watterson Hotel at this place consumes about 2500 tons of nut and slack coal per year and will be in the market some time in September. Bidders should include cost of delivery. Address Mgr. Jones, Watterson Hotel, Louisville, Ky.

+1261—Kenmare, N. D.—The Kenmare School District No. 28 will receive sealed bids until 8 p.m., Sept. 14, for furnishing coal to the city schools as may be required during the ensuing year. Bidders should specify whether upper or lower Lake coal will be furnished. Address Clk. J. M. Rohe, Kenmare, N. D.

1262—Des Moines—Bids will be asked for by the Independent School District soon for supplying coal to the 60 schoolhouses in the local school district. The board buys steam, mixed nut and lump coal. The contract will probably be let about Sept. 1. Address Board of Education, Des Moines, Iowa.

1263—New Orleans, La.—The Crescent City Stock Yards & Slaughter House Co. is now testing samples of washed and nonclinkering coal preliminary to letting its contract, involving approximately 5000 tons. It is expected the contract will be awarded before Sept. 1. Address Purchasing Agent, Crescent City Stock Yards & Slaughter House Co., New Orleans, La.

+1264—Omaha, Neb.—The City Government received bids until Aug. 17 for furnishing Illinois 1¼-in. screened and Centerville, Iowa, lump coal during the coming year. Address City Purchasing Agent, Omaha, Neb.

+1265—Hazleton, Penn.—The Board of Education at this place usually contracts some time in September or October for its annual requirements of coal, amounting to approximately 1500 tons of pea and stove. It usually gets bids from one of the local collieries and pays for the delivery separately, at the rate of 32c. per ton. The coal usually costs $2.75 for pea and $3.75 for stove. Address School Board, Hazleton, Penn.

+1266—Wichita, Kan.—The Sedgwick County Board of Commissioners received bids until Aug. 16 for supplying the various county institutions with coal during the ensuing year. Address County Clerk, Wichita, Kan.

+1267—Wellsburg, W. Va.—The City Water Board at this place received bids until Aug. 17 for furnishing the local water plant with coal during the ensuing year. Address Secy. J. F. Thompson, City Water Board, Wellsburg, W. Va.

+1268—Steele, N. D.—The Kidder County Board of Commissioners will receive bids until 2 p.m., Sept. 1, for furnishing 140 tons of lignite coal, to be delivered in the basement of the courthouse, as required during the ensuing year. Address County Auditor, Steele, N. D.

+1269—Council Bluffs, Iowa—The Board of Education at this place received sealed bids until 8 p.m., Aug. 17, for furnishing and delivering coal to various school buildings during the ensuing year, as required. Bids are requested on 1¼-in. lump from Montgomery County, Illinois, and from the Centerville district of Iowa. The successful bidder will be required to furnish a bond of $1500. Address Secy. J. J. Hughes, Independent School Dist., Council Bluffs, Iowa.

+1270—Lake City, Minn.—The Municipal Electric Light and Water Plant at this place will contract some time in September or October for its annual requirements of coal, amounting to approximately 3300 tons. Island Creek splint nut coal is ordinarily used and the usual price is about $3.85 per ton, f.o.b. Lake City. The business is let on competitive bids. Adress Supt. M. J. Stowe, Municipal Elec. Lt. and Water Plant, Lake City, Minn.

+1271—Hastings, Neb.—The Board of Commissioners for Adams County will receive bids until 9 a.m., Aug. 30, for coal as may be required at the Court House during the year beginning Sept. 1. Bidders should specify the kind of coal and price per ton. The sucessful bidder will be required to give a satisfactory bond. Address County Clk. Charles H. Hudson, Hastings, Neb.

1272—West Point, Neb.—Bids will be received by School District No. 1 until noon, Aug. 23, for furnishing and delivering 150 tons of coal as may be required during the ensuing year. Bids are requested on Weir City nut, Illinois, Franklin County No 1 nut and Pocahontas mine-run. Address Secy. J. C. Hansen, School Dist. No. 1, West Point, Neb.

1273—Louisville, Ky.—The Starks Realty Co. of this place consumes about 900 tons of nut and slack coal per annum, for which they usually contract about Sept. 1. Deliveries are made by wagon and they have a storage capacity of 40 to 50 tons. Address Pur. Agt. Clifton Rochs, Starks Realty Co., 4th and Walnut St., Louisville, Ky.

+1274—Des Moines, Iowa—The Board of Supervisors of Polk County is conducting a series of tests to determine whom this contract should be awarded to and a decision will be reached about Sept. 1. The bids submitted were: Dan O'Grady, $1.89; Evans-Lloyd, $1.90; Carbon Coal Co., $1.90; Bennett Bros., $1.95, all for mixed nut. Address Board of Supervisors, Polk County, Des Moines, Iowa.

+1275—Ft. Worth, Tex.—The School Board at this place has authorized the purchase of approximately 500 tons of domestic lump coal in the open market. Address Supt. Moore, of City Schools, Ft. Worth, Tex.

1276—Cleveland, Ohio—The Acme Foundry Co. of this place usually consumes about 200 tons of 3x6-in. egg coal per annum, for which they ordinarily contract some time in September. Deliveries are made by rail at the rate of about 40 tons per month. They have a storage capacity of 100 tons. Address Purchasing Agent, Acme Foundry Co., Cleveland, Ohio.

+1277—Hay Springs, Neb.—The Board of Education, District No. 3, will receive sealed bids until 6 p.m., Aug. 31, for furnishing coal to the public schools as required during the ensuing year. Address Dir. U. L. Parsons, Hay Springs, Neb.

+1278—Bloomington, Ind.—The Board of County Commissioners at this place will receive bids until Sept. 7 for furnishing 100 tons of No. 4 coal. Address County Audr. W. F. Kinser, Bloomington, Ind.

+1279—Jamestown, N. D.—The County Government will receive sealed bids until 2 p.m., Sept. 1, for furnishing and delivering 150 tons of deep-mined lignite coal and 20 tons of anthracite stove coal. A separate bid f.o.b. cars at Jamestown will be received on the lignite coal. Address County Audr. Andrew Blewett, Jamestown, N. D.

1280—Burlingame, Kan.—Sealed bids will be received until Aug. 28 for furnishing coal as may be required at the school buildings of District No. 7 during the ensuing year. Address Clk. F. M. Nelson, Burlingame, Kan.

1281—Dallas, Tex.—The Board of Education is in the market for from 800 to 1200 tons of domestic nut coal. The maximum price has been limited to $1.70 per ton. Address Secy. C. M. Moore, Bd. of Edu., Dallas, Tex.

1282—Milnor, N. D.—Bids will be received by the Milnor School District until Aug. 23 for furnishing 50 tons of screened Youghiogheny soft coal and 10 tons of anthracite, bids not to include cost of delivery. Address Clk. H. K. Pennington, Bd. of Edu., Milnor, N. D.

+1283—Philadelphia, Penn.—The City Government may readvertise for bids to supply the Water Department until the close of the present year. While this contract has been awarded for the entire year, yet for the past three years, with a reform mayor in the saddle and a reactionary Council continually opposing him, the Council never appropriates sufficient money to meet the contract, so the law requires when all the appropriated money has been absorbed by deliveries that new bids be advertised for on a deficiency contract. Dealers then supplying coal on this new contract must await the pleasure of Council before receiving their money. It seems that such a method is certainly a hardship on the persons securing the contract in the first instance, but it has not yet happened that the deficiency contract has been awarded to any but the original contractor. However, there is no reason why such a contingency will not arise, and when it does it is also likely to be productive of a lawsuit on the part of the dealer who has his contract taken from him through no fault or failure on his part. Address Water Department, Philadelphia, Penn.

+1284—Council Bluffs, Iowa—Bids will be received by the Free Public Library until noon, Sept. 1, for coal to be delivered at the library building as may be required during the ensuing season. Address Librarian, Free Pub. Library, Council Bluffs, Iowa.

+1285—Bay City, Mich.—The County Government received bids until Aug. 20 for furnishing and delivering nut and steam lump coal for the courthouse heating plant as may be required during the ensuing year. Proposals are limited to the products of mines in Bay County. Address County Auditor, Bay City, Mich.

+1286—Fargo, N. D.—The Cass County Board of Commissions will receive bids until nooon, Sept. 8, for furnishing and delivering coal as follows: Anthracite nut and pea for the County Poor Farm, Pocahontas mine-run coal to be delivered at yard; same delivered at jail; Hocking Valley to be delivered in ton and half-ton lots; splint washed coal to be delivered in ton and half-ton lots; lignite to be delivered at courthouse; same f.o.b. yard at Fargo. Bidders should include scale charges, and all bids must be accompanied by certified check for $50. Address County Audr. Addison Leech, Bd. of County Comrs., Fargo, N. D.

+1287—Greensburg, Ind.—The Board of County Commissioners at this place will receive bids until Sept. 6 for furnishing from 75 to 100 tons of Youghiogheny coal. Address County Audr. L. W. Sans, Greensburg, Ind.

+1288—Sioux City, Iowa—Bids were received at the public library until 5 p.m., Aug. 20, for furnishing anthracite coal as may be required during the ensuing season. All bids were required to be accompanied by a check for 5 per cent. of the amount bid. Address Secy. Jeannette M. Drake, Pub. Library, Sioux City, Iowa.

+1289—Elmwood Place, Ohio—The Hamilton County Infirmary usually contracts some time in September for its annual requirements of coal involving approximately 1500 tons of smokeless mine-run. The business is let on competitive bids and the usual price is around $2.50 f.o.b. plant. Address Supt. Charles Weisbrod, Hamilton County Infirmary, Elmwood Place, Ohio.

+1290—Ellendale, N. D.—The Dickey County Board of Commissioners will receive bids until 2 p.m., Sept. 7, for furnishing approximately 200 tons of Youghiogheny mine-run coal to be delivered in the bins at the courthouse. Address County Audr. C. C. Misfeldt, Ellendale, N. D.

+1291—Joliet, Ill.—The Joliet Township High School Board received bids until noon, Aug. 19, for furnishing approximately 625 tons of Pocahontas mine-run and 40 tons of nut coal, to be delivered as required during the ensuing year. Proposals must be submitted according to a B.t.u. basis and must be accompanied by a check for $100. Address Clk. J. F. Skeel, Joliet Township High School, Bd. of Edu., Joliet, Ill.

+1292—Larimore, N. D.—The Board of Education received sealed bids until 8 p.m., Aug. 20, for furnishing 100 tons of Youghiogheny, Hocking, Pocahontas or lignite screened lump coal, to be delivered in the basement of the schoolhouse during the season beginning Sept. 15. Proposals should be submitted on the B.t.u. basis and accompanied by a check for $150. Address Clk. F. W. Reinoehl, Bd. of Edu., Larimore, N. D.

1293—Brinsmade, N. D.—The Riggin School District No. 4 received sealed bids until 2 p.m., Aug. 21, for furnishing and delivering one 40-ton car of Pocahontas smokeless lump coal in the basement of the public school house. Address Clk. F. W. Bowman, Riggin School Dist. No. 4, Brinsmade, N. D.

1294—Cuba, Ill.—The local School Board received sealed bids until 6 p.m., Aug. 20, for furnishing either mine-run or screened coal to be delivered in the local school building during the ensuing year. The successful bidder will be required to give a bond guaranteeing the faithful performance of the contract. Address Secy. R. V. Whitriah, Board of Education, Cuba, Ill.

+1295—Grove City, Penn.—The Grove City School Board will receive bids until Aug. 28 for furnishing coal as required during the ensuing year. Address, Secretary, Grove City School Bd., Grove City, Penn.

+1296—Alliance, Neb.—The Alliance school district received sealed bids until Aug. 20 for furnishing approximately 500 tons of lignite nut and egg coal (passing through a 4-in. bar or 6-in. round screen and over a 1-in. round screen). Bids should be submitted f.o.b. cars, or delivered in bins. Address Secy. F. W. Harris, Alliance School Dist., Alliance, Neb.

+1297—Bishop, Calif.—The Bishop Union High School will receive bids until 2 p.m., Aug. 28, for furnishing coal as required during the ensuing year. Address Clk. W. P. Teel, Bishop Union High School Trustees, Bishop, Calif.

+1298—Hannaford, N. D.—The local School Board will receive bids until Sept. 1, for furnishing 45 tons or more of Pocahontas coal to be delivered at the local school house. Address Clk. John Sad, Hannaford School Bd., Hannaford, N. D.

+1299—Columbus, Ohio—The Ohio Board of Administration, which has charge of more than a dozen Ohio charitable and penal institutions has asked for bids on Ohio mine-run coal for the Cleveland State Hospital up to 10,000 tons. The board has also asked for bids on 13,000 tons of either mine-run or three-quarter Ohio coal for the Columbus State Hospital. No time is set for the closing of bids. The coal is to be delivered on the switches of the institution at the request of the state board. Bids will also soon be asked for on the following amounts of Ohio-mined coal: Longview State Hospital, Cincinnati, 10,000 tons; Ohio Hospital for Epeleptics at Gallapolis, 10,000 tons; Mansfield Reformatory, 6000 tons; Delaware Girls Home, 3000 tons; Feeble Minded Institution at Columbus, 8000 tons; Toledo State Hospital, Toledo, 10,000 tons; Ohio Penitentiary, Columbus, 15,000 tons; Ohio Institution for the Blind, Columbus, 8000 tons; Institution for the Deaf and Dumb, Columbus, 6000 tons. Address Purch. Agt. R. V. Lyons, Ohio Board of Administration, Columbus, Ohio.

1300—Louisville, Ky.—The Louisville Gas & Electric Co. usually contracts some time during the current month for approximately 60,000 tons of pea and slack. Deliveries are made by railroad at the rate of 3100 tons per week. The coal is bought on a B.t.u. basis. Address Pur. Agt. Graham Davis, Louisville Gas & Electric Co., Louisville, Ky.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

+746—Seattle, Wash.—This contract (Vol. 7, p. 917), which provides for furnishing the local Board of Education with approximately 8000 tons of coal, has been awarded on the following basis, which provides for furnishing and delivering the coal at the school building: **Pacific Improvement Co.,** Carbondale mine-run, $4.12½ a ton; **J. W. Bullock,** Reuton lump and nut, $3.85; **Durham Colliery Co.,** Durham lump and nut at $4. The city is divided into three districts and the companies will alternate on the business. Address Secy. R. W. Jones, Bd. of Edu., 347 Central Bldg., Seattle, Wash.

No. 966—Pineville, La.—This contract (p. 41), which provides for furnishing the Louisiana Hospital for the Insane, at this place, with its fuel requirements for the ensuing year, has been awarded to the **Birmingham Fuel Co.,** Birmingham, Ala., at $3.75 per ton delivered at Pineville; 1330 tons were purchased at this price. Address Supt. John N. Thomas, M. D., Louisiana Hospital for the Insane, Pineville, La.

+1007—New Castle, Penn.—This contract (pp. 77, 243), which provides for furnishing the local School Board with approximately 1800 tons of ¾-in. and 550 tons slack coal has been awarded to **F. G. Gano** at $2.19 per ton for the former and $1.75 per ton for the latter. The cost includes delivery in bins at the various school buildings. Address Secy. H. M. Marquis, School Dist. of the City of New Castle, North and East St., New Castle, Penn.

+1046—Two Harbors, Minn.—This contract (p. 116), which provides for furnishing the City Government with approximately 6000 tons of coal, has been awarded to the **Valley Camp Coal Co.,** Cleveland, Ohio, on the following basis: 1000 tons of Hocking, $2.25; 2000 tons of splint, $2.40; 2000 tons Youghiogheny screenings, $1.70; 1000 tons anthracite, $6.10. Address Light & Water Dept., Two Harbors, Minn.

1048—Middletown, Ohio—This contract (p. 116), which provides for furnishing the fuel requirements of the Colin Gardner Paper Co., aggregating approximately 50,000 tons of nut and slack coal per annum, has been awarded. No details are available at this time. Address Assist. Treas. M. S. Johnston, Colin Gardner Paper Co., Middletown, Ohio

+1054—Ottumwa, Iowa—This contract (pp. 116, 157), which provides for furnishing the local School Board with approximately 1600 tons of screened lump coal, has been divided equally between Styre Bros. and Dan Shea, both of whom bid 10⅜c. per bu. The business last year was let at about $2.70 per ton. Address Secy. J. A. Wagner, Bd. of Edu., Ottumwa, Iowa.

+1059—Toledo, Ohio—This contract (p. 116), which provides for furnishing the county government with coal, has been awarded as follows: **West Crescent Fuel Co.** for armory and court house, Pocahontas mine-run at $3.19; **Geo. M. Jones Co.,** for infirmary, Tropic Hocking ¾-in. lump at $2.10. Address Audr. Charles J. Sanzenbacher, Lucas County, Toledo, Ohio.

+1061—Mason City, Iowa—This contract (p. 116), which provides for furnishing the county institutions with approximately 1800 tons of coal, has been awarded to the **Independent Grain & Lumber Co.** on Wilmington, Ill., egg coal at a delivered price of $3.90 per ton. Address County Audr. Geo. E. Frost, Mason City, Iowa.

+1070—Ashtabula, Ohio—This contract (p. 117), which provides for furnishing the local Board of Education with approximately 100 tons of the best three quarter Pittsburgh coal to be delivered as required during the ensuing year, has been awarded to the **Ashtabula Coal Co.** Address Clk. Charles E. Peck, Bd. of Edu. Ashtabula, Ohio.

1086—Clinton, Mo.—This contract (p. 117), which provides for furnishing the County Government with coal has been awarded as follows: **Docherty Fuel Co.,** screened lump to be delivered at the court house and jail, $3.37½; **M. E. Lane,** screened coal for the county hall, $2.37½. Address Deputy Thornton Jennings, Clinton, Mo.

+1088—New York, N. Y.—This contract (pp. 117, 198), which provides for furnishing the Department of Bridges with about 200 tons of No. 1 buckwheat, has been awarded to **Burns Bros.,** who were the lowest bidders at $1637.50. Address Bridge Comr. F. J. H. Kracke, Municipal Bldg., New York City.

+1093—Franklin, Penn.—This contract (p. 117), which provides for furnishing the City Government with approximately 2400 tons of three-quarter lump coal, has been awarded to the **Mercer Iron & Coal Co.,** of Stoneboro, Penn., at $1.68 per ton. Address City Clk. J. G. Crawford, Franklin, Penn.

1096—Kansas City, Mo.—This contract (p. 157), which provides for furnishing Montgomery, Ward & Co. at this place with approximately 6000 tons of Cherokee mill coal, has been awarded to the **J. H. Leonard Coal Co.** Address Pur. Agt. H. R. Lipton, Montgomery, Ward & Co., Kansas City, Mo.

1102—Beaver Falls, Penn.—This contract (p. 157), which provides for furnishing the schools of North Sewickley Township with coal, has been divided equally between **B. Wiley** and **W. Dougles**, both of whom bid 10c. per bu. for lump and 5c. per bu. for slack coal. About 1600 bu. will be required altogether. Address Secy. S. O. Swick, Beaver Falls, Penn.

1121—Springfield, Ill.—This contract (p. 158), which provides for furnishing the fuel requirements of the various state charitable institutions has been awarded as follows:

Institution	Contractor	Coal	Ash	B.t.u.'s	Tons	Price: Per Ton	Price: Per Million B.t.u.'s
Elgin State Hospital	E. Puttkammer Coal Co.	Ills.	13	11,400	250	$2.20	$0.0947
Elgin State Hospital	Martin-Howe Coal Co.	Ind.	12	11,600	13,000	2.00	.0818
Kankakee State Hospital	E. Puttkammer Coal Co.	Ills.	14	12,000	4,000	1.85	.0762
Kankakee State Hospital	Marion County Coal Co.	Ill.	15	11,000	22,000	1.57	.0695
Jacksonville State Hospital	R. E. Gannon	Ill.	12.5	10,800	7,500	1.59	.0712
Jacksonville State Hospital	R. E. Gannon	Ill.	14	10,400	7,500	1.24	.0711
Anna State Hospital	Taylor Coal Co.	Ind.	10.5	11,800	40	1.80	.0733
Anna State Hospital	Collieries Sales Co.	Ind.	11.6	11,400	12,000	1.40	.0584
Anna State Hospital	Bell and Zoller Coal Co.	Ill.	8	12,200	400	1.96	.0795
Watertown State Hospital	Bell and Zoller Coal Co.	Ill.	10	11,540	200	2.30	.0935
Watertown State Hospital	R. E. Gannon	Ill.	13	10,500	12,000	1.52½	.0640
Peoria State Hospital	R. E. Gannon	Ill.	14	10,700	400	1.57	.0724
Peoria State Hospital	David Rutter Co.	Ill.	17	10,500	22,000	1.10	.0523
Chester State Hospital	West Virginia Coal Co.	Ill.	11	12,250	7,750	1.47	.0583
Chicago State Hospital	Power Coal Co.	Ill.	10	12,500	4,000	2.02	.0768
Chicago State Hospital	Power Coal Co.	Ill.	11.47	11,550	11,000	1.64	.0662
Lincoln State Sch. & Colony	Citizens' Coal Min. Co.	Ill.	15	10,500	1,000	1.44	.0685
Lincoln State Sch. & Colony	R. E. Gannon	Ill.	14	10,300	10,000	1.17	.0538
Illinois School for the Deaf	Lincoln-Springfield Coal Co.	Ill.	13	11,100	7,000	1.61	.08513
Illinois School for the Deaf	Lincoln-Springfield Coal Co.	Ill.	13	11,300	60	1.80	.0796
Illinois School for the Blind	Lincoln-Springfield Coal Co.	Ill.	13	11,100	2,500	1.61	.08423
Ill. Industrial Home Blind	Albany Coal Co.	Ill.	12	12,350	500	2.60	.1028
Soldiers' and Sailors' Home	Lincoln-Springfield Coal Co.	Ill.	13	11,100	1,000	1.92	.0846
Soldiers' and Sailors' Home	John L. Pire	Ill.	16.36	10,386	4,000	1.24	.0590
Soldiers' and Sailors' Home	John L. Pire	Ill.	16.36	10,386	10,000	1.44	.0687
Soldiers' Widows' Home of Ill.	Lincoln-Springfield Coal Co.	Ill.	12	11,800	800	2.04	.0864
Illinois Soldiers' Orphans' Home	Lincoln-Springfield Coal Co.	Ill.	13	11,300	5,000	1.75	.0756
Ill. Charitable Eye & Ear Infirmary	Albany Coal Co.	Ill.	5	14,850	500	3.90	.1306
State Training Sch. for Girls	Martin-Howe Coal Co.	Ind.	12	11,600	6,000	1.89	.0771
St. Charles Sch. for Boys	O'Gara Coal Co.	Ill.	9	12,500	8,000	2.52	.0960

Address Illinois State Board of Administration, Springfield, Ill.

Contract Notes

Toledo, Ohio—The Board of Public Safety has awarded a contract for 500 tons of Kanawha gas coal for use at the workhouse.

Minot, N. D.—The contract to furnish coal to the Minot School district was awarded to **L. D. Colton,** of Burlington, at $2.45 per ton.

France—Press reports are to the effect that Dr. Arnaud Rosenthall, representing the French Government, is at Pittsburgh negotiating the purchase of more than 3,000,000 tons of bituminous coal.

Dayton, Ohio—The contract to supply 300 tons of Smithers Creek coal to the Memorial Building, has been awarded to **J. D. Whitmore,** at $2.50 per ton delivered. Nine other coal dealers submitted bids.

Spain—An American consular officer in Spain writes that a business man in his district desires to represent American exporters of coal. New York City references given. Correspondence should be in Spanish.

Switzerland—An American consular officer in Switzerland reports that an association in his district desires to communicate with American producers and exporters of coal. Specifications, etc., may be had on application to the Bureau of Foreign and Domestic Commerce or its branch offices.

West Indies—An American consular officer reports that a West Indian railway purchasing about 600 tons of patent fuel per year wishes quotations on lots of 100 and 200 tons. It is stated that the fuel must be free burning and that it must not clog the grates. Quotations should be made c.i.f. destination.

Bellefontaine, Ohio—The School Board has let contracts for the coal supply for the coming year as follows: Silver Lake Ice & Coal Co., 200 tons of splint, lump, at $2.98; Kerr Bros., 100 tons Pocahontas mine-run at $3.05; Bloom Bros., 200 tons of Pocahontas mine-run at $2.85, and 50 tons of Kentucky block at $2.85.

Du Quoin, Ill.—The Blakeslee Mfg. Co., at this place, consumes about 1000 tons of 1-in. screenings per annum. Deliveries are by railroad at the rate of one or two 50-ton cars per month. The coal is bought from local mines. Address Pur. Agt. E. T. Blakeslee, Blakeslee Mfg. Co., 235 N. Chestnut St., Du Quoin, Ill.

Chile—The chief engineer of a gas company in Chile has informed a commercial attache of the Department of Commerce that he desires to obtain samples of the best American coking coal. The commercial attache has transmitted a report on this opportunity which may be had on application at the Bureau or its branch offices.

Erie, Penn.—The contract for furnishing the local Fire Department with coal during the ensuing year (p. 200) has been divided equally among the following companies, all of whom bid $5.15 for No. 4 anthracite delivered: Burnwell Coal Co., Meyer Coal Co., Mutual Coal Co., Wittmann-Pfeffer Co., Guelcher Bros., Saltsman Coal & Supply Co., Erie Coal Co. Address Clk. J. H. Callaghan, Director of Public Safety, Erie, Penn.

Helena, Mont.—Contracts for furnishing the State Institutions with coal during the ensuing year have been let by the State Board of Examiners as follows: Northwestern Coal Co., 8400 tons; International Coal Co., 6775 tons; Union Pacific Coal Co., 800 tons; Roundup Coal Co., 720 tons. Other bidders on the contracts were C. W. Scott, Montana Coal & Iron Co., National Fuel Co., Nelson Fuel Co., Interstate Lumber Co., C. H. Vourk and Wyoming Coal Co.

Sioux Falls, S. D.—Contracts for furnishing the local Board of Education with coal for the coming year were awarded as follows: **Schoeneman Bros.** (anthracite), $10.55; **Sioux Falls Fuel Co.** (bituminous), $6.75. Other bidders were: Schoeneman Bros. (bituminous), $6.85; Sioux Falls Fuel Co. (anthracite), $10.64; H. T. Parmley (anthracite), $10.65 (bituminous), $6.80; W. A. Mills (anthracite), $10.78 (bituminous), $6.89; W. Z. Sharp Elevator Co. (anthracite), $10.74 (bituminous), $6.79; Loonan Lumber Co. (anthracite), $10.65 (bituminous), $6.96.

Fort Worth, Tex.—After receiving and tabulating bids for coal for the city schools of Fort Worth for the coming year, the School Board decided to burn gas for heating the school rooms. Bids on coal were received from Hefley-Coleman Co., the Tri-State Coal Co. and C. H. Lilly, all of Ft. Worth; and W. E. Melton Co., of Bridgeport, Tex. These included bids on a new brand of coal, known as the Arkansas semianthracite, which it was represented had given excellent service.

Dallas, Tex.—Contract for supplying 1000 tons of coal for the public schools was awarded to the **Fidelity Fuel Co.,** of Muskogee, Okla., at $2.50 per ton f.o.b. the mines. Other bids were: Penniman Coal Co., McAlester domestic lump, $3.70; Wilburton, domestic lump, $3.20; Henryetta or Dewar domestic lump, $2.75; Greenwood fancy domestic lump, $2.50; Greenwood domestic lump, $2.50; Pulliam Fuel Co., McAlester domestic lump, $3.70; Wilburton domestic lump, $3.20; Dewar domestic lump, $2.75; Arkansas domestic lump, $2.50; Greenwood screened nut, $2. Western Coal & Mining Co., Arkansas fancy lump, $2.50. Green Ridge Coal Co., Green Ridge or Dewar domestic lump, $2.50. McAlester Fuel Co., McAlester domestic lump, $3.70; Wilburton domestic lump, $3.20; McAlester fancy nut, $3; Wilburton fancy nut, $2.75; Guntheur-Greenwood nut, $1.75; Guntheur-Greenwood semianthracite, $1.80; Dewar machine-mined domestic lump, $2.75; Dewar machine-mined fancy nut, $2.50; Guntheur-Greenwood machine nut, $2; James A. Lincoln, Henryetta or Dewar domestic lump, $2.60; Union Coal Co., domestic lump, $2.25. Central Ice & Cold Storage Co., machine-mined domestic lump, $2.50; machine mine-run, $1.75. The board decided to buy 800 or 1000 additional tons of coal on the open market. Address Secy. C. M. Moore, Board of Education, Dallas, Tex.

COAL AGE

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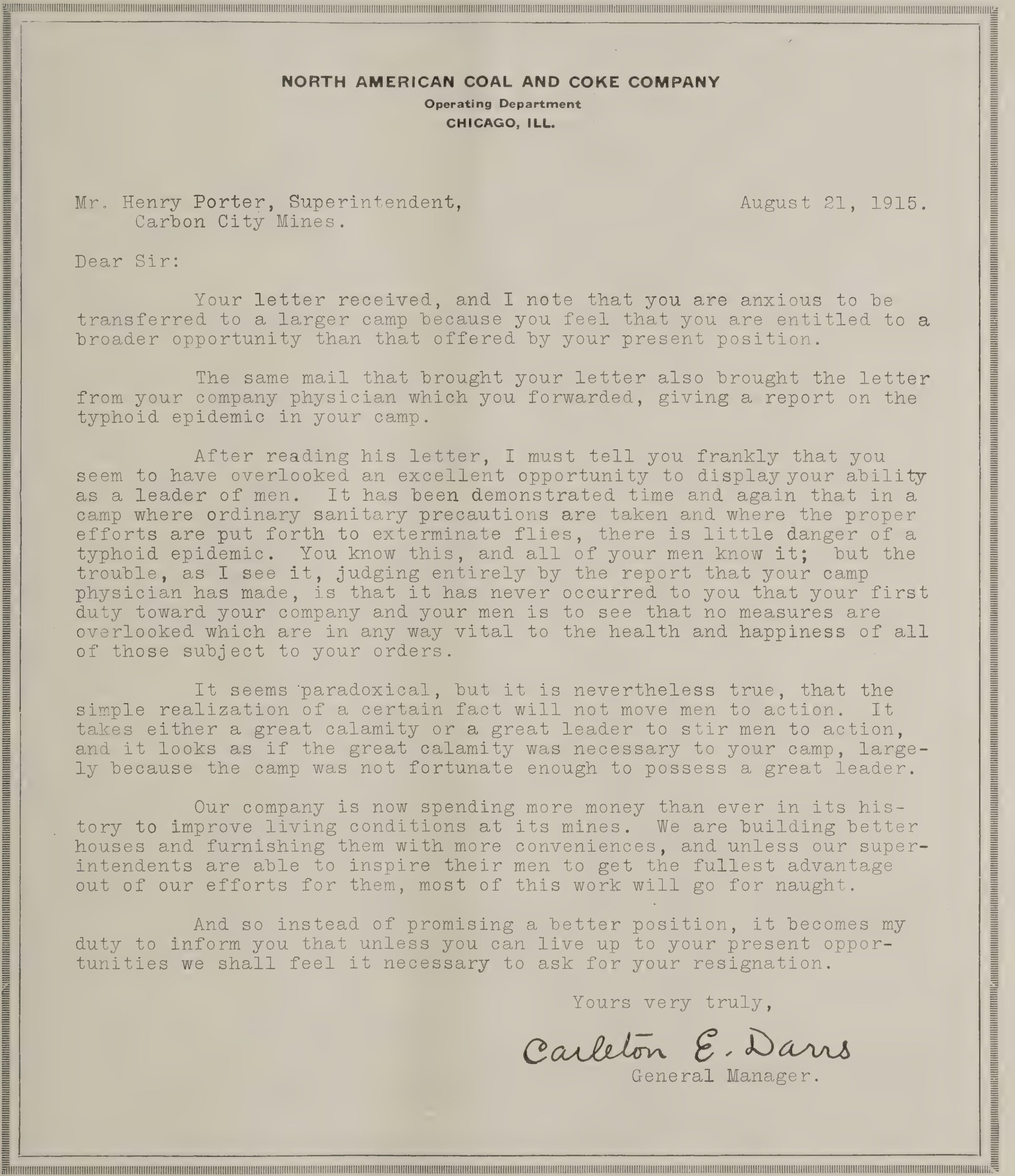


NORTH AMERICAN COAL AND COKE COMPANY
Operating Department
CHICAGO, ILL.

Mr. Henry Porter, Superintendent,
Carbon City Mines.

August 21, 1915.

Dear Sir:

Your letter received, and I note that you are anxious to be transferred to a larger camp because you feel that you are entitled to a broader opportunity than that offered by your present position.

The same mail that brought your letter also brought the letter from your company physician which you forwarded, giving a report on the typhoid epidemic in your camp.

After reading his letter, I must tell you frankly that you seem to have overlooked an excellent opportunity to display your ability as a leader of men. It has been demonstrated time and again that in a camp where ordinary sanitary precautions are taken and where the proper efforts are put forth to exterminate flies, there is little danger of a typhoid epidemic. You know this, and all of your men know it; but the trouble, as I see it, judging entirely by the report that your camp physician has made, is that it has never occurred to you that your first duty toward your company and your men is to see that no measures are overlooked which are in any way vital to the health and happiness of all of those subject to your orders.

It seems paradoxical, but it is nevertheless true, that the simple realization of a certain fact will not move men to action. It takes either a great calamity or a great leader to stir men to action, and it looks as if the great calamity was necessary to your camp, largely because the camp was not fortunate enough to possess a great leader.

Our company is now spending more money than ever in its history to improve living conditions at its mines. We are building better houses and furnishing them with more conveniences, and unless our superintendents are able to inspire their men to get the fullest advantage out of our efforts for them, most of this work will go for naught.

And so instead of promising a better position, it becomes my duty to inform you that unless you can live up to your present opportunities we shall feel it necessary to ask for your resignation.

Yours very truly,

Carleton E. Davis
General Manager.

Why He Was NOT Promoted

Ideas and Suggestions

"Preparing" for Better Times

By Pennsylvania Engineer

Mr. Boss, how do you size up? In the language of the trapper boy, Are you there? We are on the eve of better times. You have been inspecting the plant, noting what improvements and additions are necessary to meet this change. You have placed a new piston in the hoisting engine, put in a large-size discharge line from the big pump, repaired the headframe—everything looks in tiptop shape now, and you are feeling mighty good and ready to put out more coal than ever before.

But—hold on, you are not through yet! How about yourself? Are you in tiptop shape to meet this business? You don't know as there is anything the matter with you? Well, just give yourself the "once over" and see. You have often found that you have misjudged a man and that he has good qualities of which you never dreamed. Now, there is no danger of you misjudging yourself in this manner. A man's opinion of himself is likely to be very much sugar-coated, so forget for awhile how good you are and sit down and ask yourself a few questions.

Are you still a man of your word? Do the men look up to you and respect you? Have you control of your temper? Have you contracted any bad habits? Are you next to all the new mining wrinkles and new types of machinery?

Now, if you are honest in your examination you will surely find some defect in your makeup—something that you can remedy or improve.

Fulfill All Promises

If you have got into the habit of making promises to your men and not fulfilling them, you had better cut it out. If you do not have the regard of the men, you had better get it in a hurry. Miners are going to be scarce and the boss who appreciates his men will be the one who will have his plant running full when prosperity hits us.

If you have not read up on new methods and new machinery, you had better "get next" or some other fellow will have your job. Better be sure that your health is good. A sick man is only half a man.

Analyze yourself, find your faults, and you will become a better man.

The fellow that knows himself—knows his strength, knows his weakness—is the fellow who gets there.

⁂

The "Big Boss"

By Forney L. Parker

The claim is made that coal companies are soulless and heartless and that the employees are mere cogs in a big industrial machine, to which less consideration is paid than to the rough iron or steel itself. It is the duty of the man who directs the aims and purpose of the company in the field—the manager, the superintendent, the "big boss"—to dispel this piece of fiction.

By giving attention to your employees' grievances, showing an interest in their work, in many cases calling them by their first names and by having their welfare and safety at heart, you get them to think and to have confidence in themselves and in the company. It is a tangible incentive to do good work.

I remember an employee—I will call him "Eddie Malone," which is not his name—who was directed by the foreman one morning to perform a certain task. In giving his instructions the foreman unthinkingly called him "Malone," whereas his usual way of addressing him was "Eddie." This set Eddie thinking, which is very good for one provided he is on the right track. In this case, however, the miner thought the boss had started to call him by his surname preparatory to sacking him. In fact Eddie was so busy asking himself why, that he did not have much time for the work at hand.

I merely relate this incident to illustrate the importance of giving your full measure of consideration to the man who works for you, whether he is trapper-boy or your first assistant. If the company has a soul, a high ideal, a definite purpose, you, more than anyone else, are duty bound to convey this spirit to your employees.

This attitude of the "big boss" will be reflected by his lieutenants—men who have charge of important divisions of work and who carry out his directions; and it will do much toward creating a human machine of which all the essential parts will work together in perfect harmony.

⁂

A Plea for a Better House

I am a hoisting engineer. All my life I have lived in company houses, in the summer to roast and in the winter to freeze. While single I did not mind these conditions; in fact, I never thought of them as hardships.

But now I am married and have a family of three. I am proud of them and would like to provide a pleasant and comfortable home. We would like to have flowers around the house and a nice big garden. We would like to have a kitchen and—yes, a bathroom in this house of ours; for we get as dirty as anyone—perhaps a little more, living in a coke town.

Can you tell me where I can find such a place? I have been looking for several years, but so far have not been successful in locating one.

My present house is as good as any in the town where we now live. They are all alike. Most company houses are. Of course, they are just about what our foreign neighbors want, but how about us Americans? Our house contains four rooms—two on the first floor and two on the second. We have to cook and eat in the same room—pretty hot this warm weather. We have tried to raise flowers and vegetables on our little piece of ground, but the houses are set so close together that the sun can never see our plants. Winter will soon be here again, and then in spite of our big coal stoves our house will again always be cold, like it was last winter. Pretty tough on the kids.

I believe I am a good workman. I make good wages and like my work. If I just had that home now, I would be perfectly satisfied. We pay $7 a month for our house. How glad I would be to pay $10 or $12 for one like I have in mind. It might cost a few hundred dollars more to build, yet I would willingly pay the interest-difference in rent.

We would feel like we had a home then and would be contented. Can you tell me where I can find the opportunity to realize my modest desire?

Facts Worth Considering

By J. J. Roby

Our laws protect the consumer against extortion on the part of the producer, but they do not protect the producer against the folly of his competitors.

Because of certain hazards not present in other lines of business, the coal operator is entitled to a larger measure of profit than men engaged in most other industries.

The coal operator, unlike the manufacturer, must at once acquire sufficient raw material to operate a long period of years. Furthermore, the mine owner, because of constant depletion of coal and rapid depreciation of plant, cannot keep his property intact.

The method of cost accounting in use at any mine should enable the operator to accurately determine the cost of conducting his business, which should include a reasonable profit, and to continue the operation at a profit until all the coal is mined.

The cost of production, if properly computed, will indicate about the same selling price for coal of similar grades, regardless of ownership, magnitude of operation, probable duration of operation and physical conditions.

When the coal operator sells coal at less than cost, in order to keep his mine running, he simply disposes of a portion of his property without compensation.

When the operator sells coal at a low price, because his mine is new and his primary cost low, he suffers a loss even though he believes he is making a profit.

The operator, to make good, must earn sufficient during the earlier years of his operation to amortize a large part of his investment and reduce his interest charge.

A tract of 10,000,000 tons of coal that cannot be mined at a primary cost and marketed at a selling price to permit an initial royalty of 12c. cannot have an average value of 6c., nor can it all be mined at a fair profit.

The primary cost of operation is represented by actual expenditures made in the ordinary course of operating but should not include interest or payments on borrowed capital.

The secondary cost of operation consists of proper charges against the product for plant depreciation, coal depletion, interest on investment and capital, risk of the industry and a reasonable profit.

The proper selling price is the sum of the primary and secondary costs.

The secondary cost, or margin between selling price and primary cost, of a standard grade of coal of the best quality and with the most favorable physical conditions, determines the basic value for coal of that grade, the value being modified as adverse physical conditions increase primary cost and as poorer quality reduces the selling price.

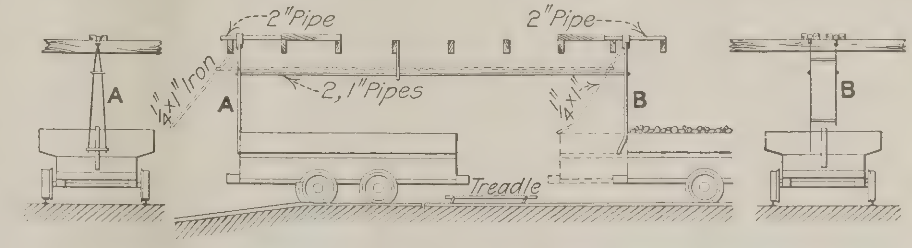
An End-Gate Lifter

By A. W. Hesse[*]

A simple arrangement in connection with a Phillips crossover dump for automatically lifting the end gate of a mine car while dumping is shown in the accompanying drawing. This arrangement is now in operation on the tipple of the Lincoln Coal Mining Corporation, at Big Creek, W. Va.

The equipment consists of three short 2-in. pipes, two 15-ft. lengths of 1-in. pipe, three pipe straps, separating pipes and bolts, and four pieces of strap iron ¼x1 in. about 5 ft. long.

The loaded car moving toward the dump strikes the arm *B* and in raising it moves the arm *A* away from the stirrup on the end gate of the empty car by means of the two 1-in. pipes connecting *A* and *B*. The arm *B* drags over the top of the loaded car, holding *A* out of the way until the loaded car bumps the empty off the dump. Then before the loaded car reaches the horns of the dump these arms drop back to their vertical positions, and *A* is ready to catch the stirrup of the loaded car when it is dumped.



DETAILS OF APPARATUS FOR LIFTING END GATES ON MINE CARS

These arms extend about 8 or 10 in. below the top of the car. While the sketch does not show it, the arm *A* is about 5 in. behind the front of the car to assure catching the stirrup of the end gate when the car is ready to dump.

The material in this apparatus is all comparatively light so that only the one rod *B* is necessary to extend below the top of the car, thus avoiding dragging over the loaded car.

The distance between the arms at the dump at Big Creek is 15 ft., leaving a space of 6½ ft. between the ends of the cars when the arms begin to lift. This distance of course may be varied, depending upon the length of the cars. Care should be taken to avoid placing the arms too close together in order that the loaded car shall not get too close to the dumping point before the front arm is in position to catch the stirrup of the end gate.

* * *

The Thicker Coal Seams Will Become Scarcer, and this day is fast approaching. Then will come the turn for the thinner seams. Joseph Dickinson estimates that in half a century many of the thick seams in Europe and America will be completely worked out, and coal will sell at a much higher price. Operators will then find it possible to work the thin beds.

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[*] Big Creek, W. Va.

Allegheny River Mining Company's Cadogan Mine

By Fred Norman*

SYNOPSIS—At this mine three coal beds will be simultaneously worked, all the coal being handled in one preparation plant. This plant is so arranged that any combination of prepared sizes from any or all of the coal measures may be loaded on the railroad cars.

The Allegheny River Mining Co., of Kittanning, Penn., is opening a new mine on the west bank of the Allegheny River in North and South Buffalo Townships, Armstrong County, Penn., known as Cadogan mine. This is the sixth large coal-mining operation of that company along the line of the Pittsburgh & Shawmut R.R., between Brookville and Freeport, Penn., and when fully developed will give the company a total output of 15,000 tons per day.

The Cadogan plant is beautifully located on an extensive flat on the Allegheny River, with the tipple yard parallel to the main track of the Pittsburgh & Shawmut R.R. Both the railroad and the mining plant are now in course of construction, and work is being pushed with the expectation of shipping coal in the fall of 1915.

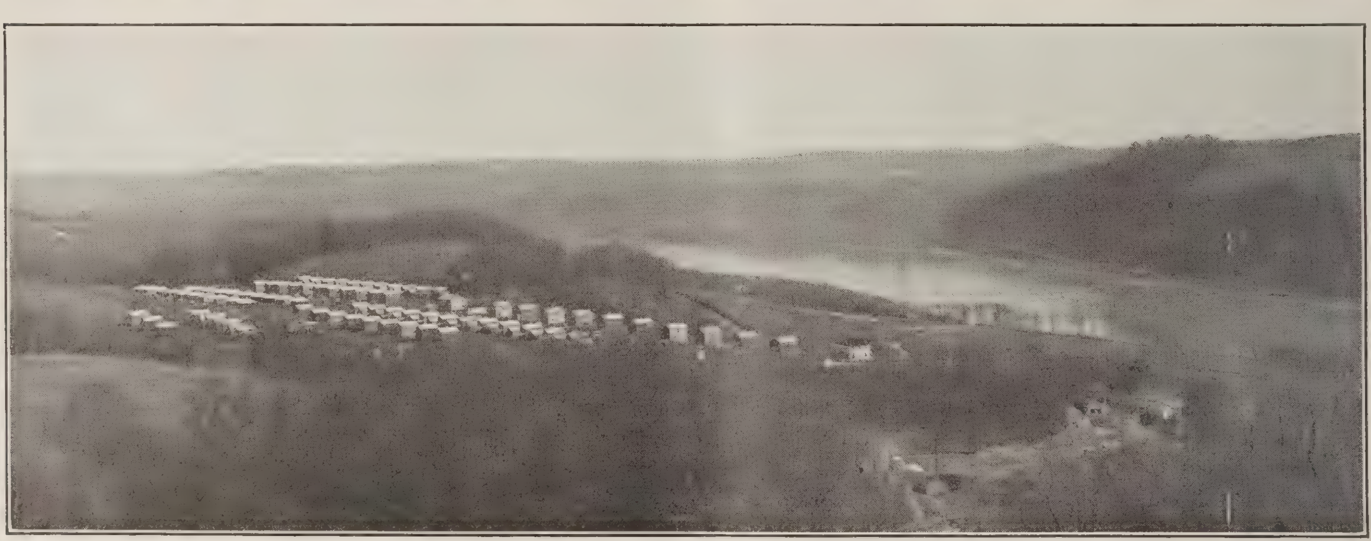
A large coal territory is tributary to this plant, and drifts are opened in three veins, which in this particular section are all of workable thickness. The principal workings will be in the Lower Kittanning, or "B," vein, while extensive operations will be pushed into the Lower Freeport, or "D," and the Upper Freeport, or "E," seams. The thickness of coal in either vein averages 42 in. with a maximum of 60 in. The "B" vein lies about 40 ft. above the normal river stage, with an interval of about 250 ft. between it and the "D," which lies about 45 ft. below the "E" seam.

The "B" seam crops full thickness on the river front, and by diamond-drill testing proves to be uniform for miles. The two Freeport veins, however, are not so regular and thin out on the edges in all directions from the body of the seams, thereby somewhat limiting the points of favorable attack to an area parallel with and about a mile back from the river. The territories covered by the Freeport veins are irregular in shape and less in area than the "B" vein, but of such magnitude as to warrant large operations in both measures.

The mine workings are laid out on the "pillar and room" system from double room entries. Main entries are driven four abreast, two haulage in the center and one airway on each side. Face entries are driven off the mains at regular intervals, forming panels of from 30 to 40 rooms off each room entry.

Superimposed Entries Will Be Employed

The two Freeport seams will be worked with entries directly above one another, while the "B" seam will be worked independently, inasmuch as the interval between it and the "D" seam is about 250 ft., composed of several sandstone and sandshale strata, not likely to cause any disturbance in the upper veins from subsidence in the lower. Furthermore, an attempt will be made to keep the upper workings ahead of the lower, since these have a mile handicap at the start. The coal in all three veins is of excellent structure and quality, with favorable roof and floor conditions.



THE TOWN, LOOKING EAST, WITH ALLEGHENY RIVER IN BACKGROUND

Coal will be mined by Sullivan shortwall electric machines, and hauled by General Electric locomotives. The mine will be ventilated by electrically driven fans and unwatered by electrically driven pumps.

The yard tracks of the railroad are on approximately the same level as the main double-track drift in the "B" vein, necessitating the elevation of the coal to screening height above the railroad cars. To overcome this it was decided to tipple the coal on the level of the ground and elevate it to the screenhouse by apron conveyors.

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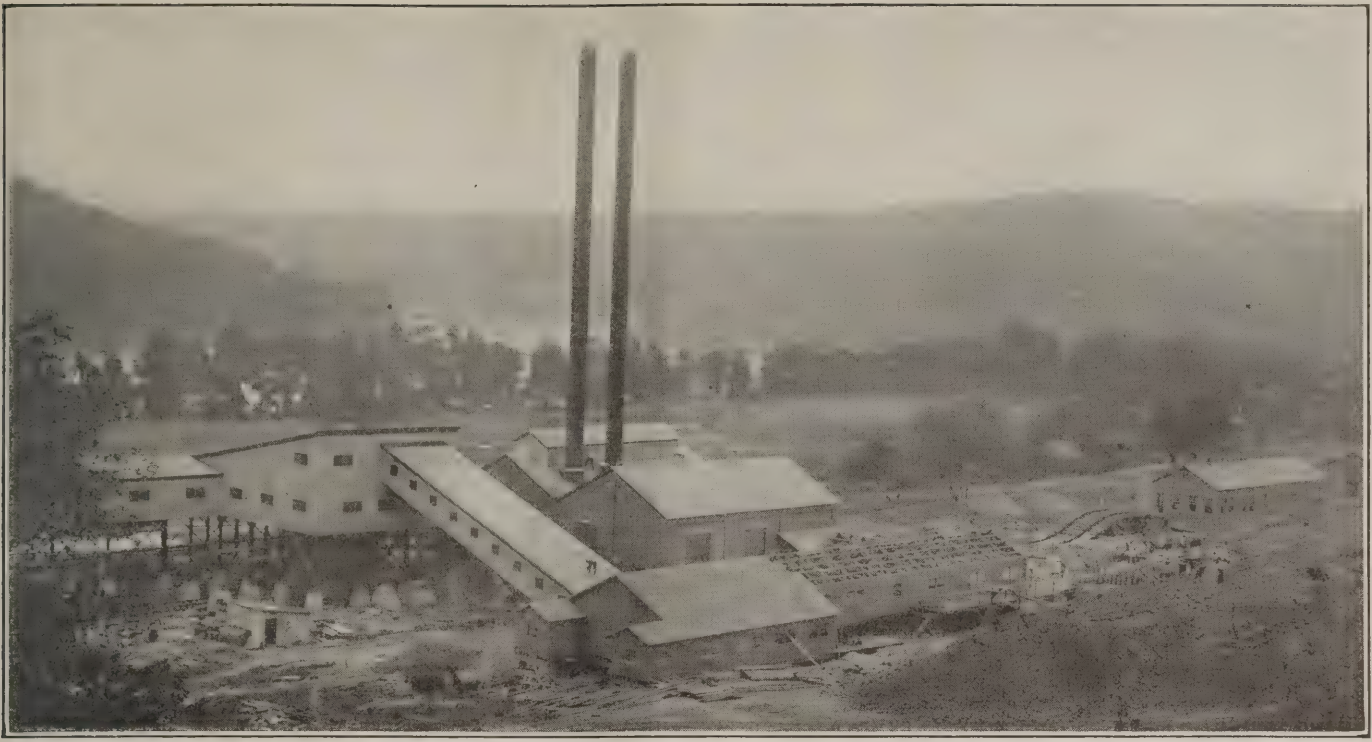
*Chief Engineer, Allegheny Mining Co., Kittanning, Penn.



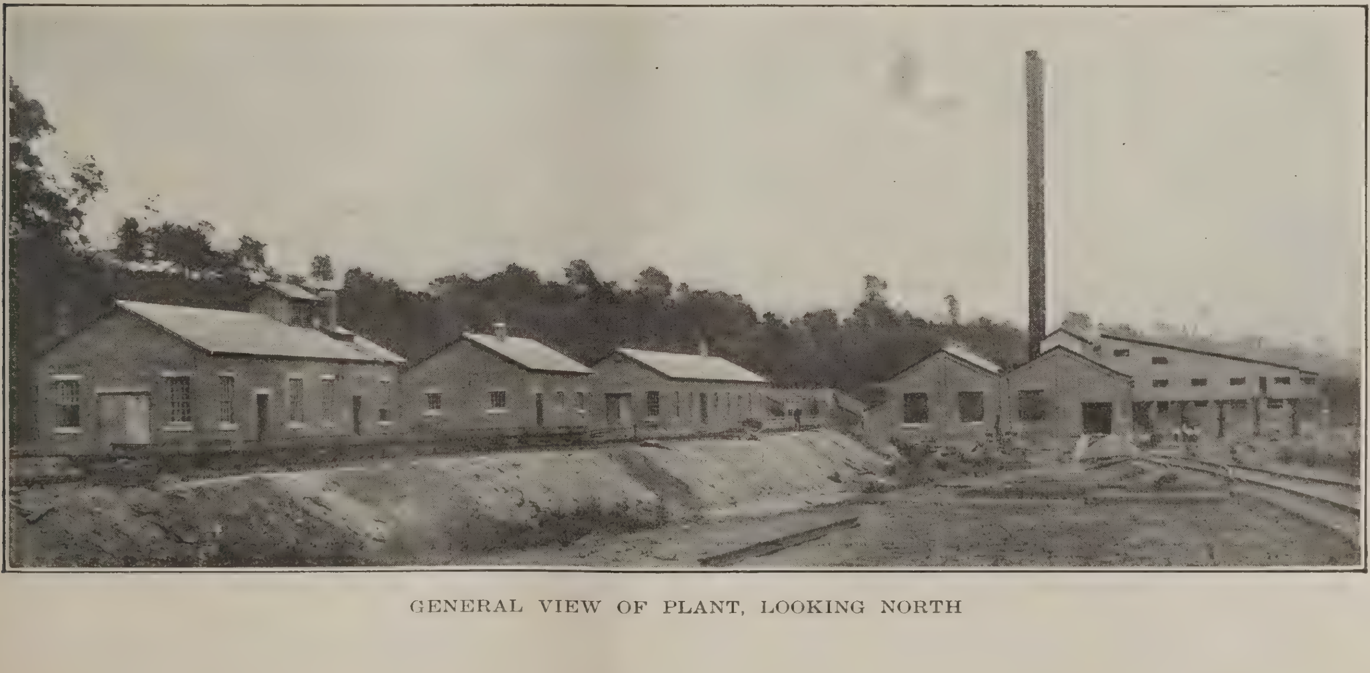
GENERAL VIEW OF PLANT, LOOKING EAST

The coal from all three beds will be delivered by locomotives to a low tipple, having two Phillips crossover dumps, two feeder car hauls, two Dempcy-Degener automatic car stops and two Standard platform scales. The locomotives will head trips in on the tipple floor, cut loose and switch over to the locomotive return track, which passes under the tipple floor. This gives the locomotives a clear track to the intersection with the empty tracks, ahead of empty cars. The trip meanwhile travels slowly ahead until engaged by the feeder carhaul, which moves the trip at will so as to place one car at a time on the scale platform. Here it is uncoupled, weighed and pushed off the scales by the next succeeding car, actuated by the carhaul.

The cars after leaving the scales run by gravity to the car stops, which hold them till released by the dumper, by means of a foot lever. Three to four cars can be held in the stops, which close automatically after each release. Coal is dumped into hoppers holding 10 to 12 cars, the bottoms of which open onto reciprocating electrically driven feeders delivering the coal to the main conveyors.

The empty cars after passing over dumps run by gravity to switchbacks and return by gravity under the tipple floor to electrically driven trip makers, which elevate them about 10 ft. and push the empty trips along tracks with a ½ per cent. grade in favor of the cars.

The coal is fed by reciprocating feeders to two apron conveyors, electrically driven, with capacities of 300 tons per hr. each, elevating it to the top of the screenhouse, where it is delivered to shaking screens of the flanged-lip type, sizing the coal into lump, nut and slack. The



GENERAL VIEW OF PLANT, LOOKING NORTH

lump, lump and nut, or run-of-mine is delivered to picking tables, at right angles to the screens, terminating in adjustable electrically operated loading booms delivering to railroad cars.

Nut coal is carried from the screens by a transverse flight conveyor delivering directly to the nut car or to another flight conveyor carrying it to the picking tables, as desired. This last conveyor, on its return course below, carries refuse from the picking tables to a crusher or to the refuse bin. This conveyor is partitioned off in the center, one side delivering to either crusher or bin and the other side to the bin only. Dirty coal, bone, etc., goes to the crusher, from which it is taken for fuel to the boilerhouse by a small flight conveyor.

The bin opens with a gate at the bottom into a mine car on a track constructed for the purpose, and all rock, pyrites, slate and other hard or incombustible matter is removed for ballast or deposited on the waste dump.

Any Combination of Sizes May Be Loaded

Provision is made for loading lump, nut, slack, run-of-mine, lump and nut, and nut and slack, while emergency chutes at the head of conveyors allow loading run-of-mine without passing the coal over the screens. Coal is loaded on four tracks under the screenhouse. Two are equipped with loading booms for lump, lump and nut, or run-of-mine; the other two, for nut, nut and slack, and slack, have no booms. Each loading track will be equipped with Fairmont car retarders, for handling the cars under the screenhouse.

The screenhouse is a steel structure covered by corrugated iron on roof and sides. Machinery is run by 220-volt alternating-current induction motors. The tipple building is of wood with corrugated asbestos-covered iron roof and sides. The screenhouse, with all its machinery and apparatus, and all the machinery in the tipple were erected and furnished by the Link Belt Co., while the tipple building was erected by the mining company.

SCREEN HOUSE AND POWER HOUSE, LOOKING NORTH

Power will be derived from two 375-kv.-a. General Electric 2300-volt three-phase 60-cycle alternators direct-connected to two horizontal sidecrank nonreleasing corliss-valve steam engines built by the Ball Engine Co. Provision is also made for the later installation of a mixed-pressure turbine to be run by exhaust steam from the engines. The electric units, with the switchboard, etc., together with the 10-ton hand-operated crane, are located in one-half of the powerhouse. The other half contains two Heine safety watertube boilers of 470 hp. each, generating steam at 150 lb. pressure and equipped with six Jones underfeed stokers. Provision is made for the installation of an additional boiler in the same compartment.

Ashes will be dropped through trap doors in the floor into steel cars in the pit beneath. One 1500-hp. Cochran open feedwater heater receives water from a tank outside of the building, and the heated water is delivered to boilers by two American steam plunger feed pumps. The water supply is derived from two 10-in. drilled wells inside the boiler house in the rear of the heater. The water is lifted and delivered to the tank by two American steam-driven deepwell pumps. It gravitates from the tank to the heater.

Engines and boilers, with apparatus and accessories, are located in a brick powerhouse building built on concrete foundations. This building has a steel-trussed red asbestos-shingle covered roof and concrete floors. Two steel stacks 56 in. in diameter and 140 ft. high above the floor rise through the roof. This building was erected by the McClintic-Marshall Construction Co. and lies in an angle formed by the tipple and screenhouse.

Power will be distributed for the present to two substations, one at No. 1 drift in the "B" vein workings and one at No. 3 drift in the "E" vein workings. This latter for a time will serve workings both in "E" and "D."

Three-phase 60-cycle 2300-volt alternating current will be taken from the switchboard to a steel distribution tower outside the powerhouse. This tower will be 25 ft. high and will contain three Pittsburgh 75-kv.-a. 2300/220-volt single-phase transformers for the tipple and screenhouse motors and the general lighting of the plant, and reactors or choke coils and lightning arresters. Three separate circuits will be led from the switchboard to the tower, with provisions for a fourth. The main power circuit consists of three No. 3 bare copper wires to supply the substations, while three No. 6 bare copper wires for ventilating fans will be supplied from a separate circuit from the switchboard. All high-tension lines are carried on wooden poles, with a minimum height from the ground of 25 ft. A No. 6 galvanized-iron static wire is carried on top of the poles, with grounds at every fifth pole. The poles are spaced 100 to 200 ft. apart, according to the contour and conditions of the ground.

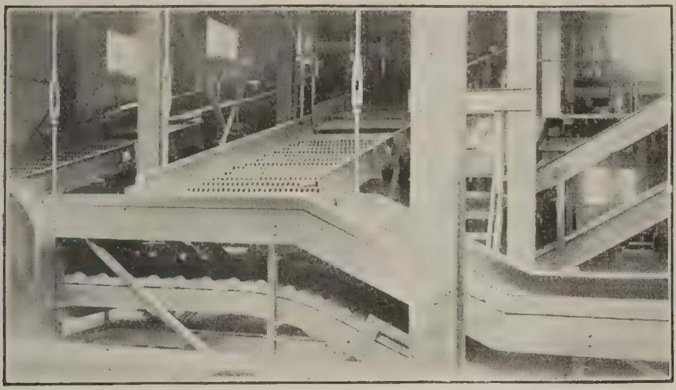
The substations are each equipped with 200-kw. synchronous motor-generator sets, with necessary switchboards, etc., and 2300-volt alternating current will be converted to 275-volt direct current for general power use. No. 1 substation has General Electric equipment, while No. 2 is a Ridgway installation. The substation buildings are brick on concrete foundations, with red asbestos-shingle roofs. Power from the substations is distributed inside and outside over No. 0000 grooved trolley wires.

Two-Speed Motor Is Used for Fan Driving

The lower mine will be ventilated by a 7-ft. Robinson fan, driven by a 150-hp. two-speed Crocker-Wheeler induction motor, and housed in a brick building with concrete foundations and roof. The fan is placed at the mouth of the air drift and has a capacity of 150,000 cu.ft. per min. at 3-in. watergage. No. 3 drift in "E" vein is to be ventilated by an 8-ft. Stine disk fan, driven by a 40-hp. Crocker-Wheeler induction motor, while the "D" vein workings will temporarily be taken care of by a 6-ft. Robinson disk fan driven by a General Electric 25-hp. 250-volt direct-current motor. All fans have Link Belt silent chain drives.

Coal from the upper workings—in the Freeport veins—will be hauled by electric locomotives to he head of a

1200-ft. incline gravity plane, equipped with a Stine figure-8 plane machine. The cars will be handled by disappearing "barneys" to the foot of the plane near No. 1 drift in "B" vein and into the common yard for all coal, from where they will be delivered to the tipple by electric locomotives. Product from the "E" vein will pass over a tramroad with 2 per cent. grade in favor of the loads to the head of the plane, while the "D" vein product will be hauled over a tramroad with 2½ per cent. grade against the loads, in order to reach the yard at the head of the plane.


VIEW INSIDE SCREEN HOUSE

The arrangement of tracks in the yard and tipple allows the keeping of the coal from the different workings separate, if so desired.

All tracks on main haulage roads are laid with 40-lb. steel rail, 30-lb. in side or room entries and 16-lb. in rooms, the latter being laid on Fairmont steel ties. The gage of the track is 42 in.

Eight-ton electric locomotives will do the hauling at the start; heavier types to be added later if necessary. Wooden mine cars are employed which are built in the company's shops at Furnace Run mine. These are of the single-bumper four-belted type, holding 3000 lb. of coal level full.

Along the yard tracks between the tipple and No. 1 drift are located the necessary mine buildings. The office and supply house, sand and oil house, repair shop and motor barn, in addition to the power house mentioned, are erected near the tipple, while near the mouth of No. 1 drift are the first-aid hospital and the mine foreman's office, in addition to No. 1 substation and fan house. All of these structures are of brick on concrete foundations and with red asbestos-shingle roofs. The mine foreman's office, the repair shop and the motor barn will be erected shortly along the tramroad to the upper or Freeport vein workings.

A mining town of 80 tenements, constructed by the Nicola Building Co., together with a superintendent's residence, hotel, doctor's office, etc., are built, with provisions made for extensions from time to time as needed, on a hill overlooking the river and the works. The town is laid out with streets and alleys, and reservations are made for schools, churches, stores and playgrounds. Waterworks supplying the town will be installed, the supply to be derived from drilled wells, with electric pumps and a 50,000-gal. tank high enough to insure good pressure. Four-inch cast-iron mains with 3-in. and 2-in. auxiliaries will distribute the water through the town. Fire plugs and hydrants will be erected at convenient points.

Construction work is still in progress, and although the larger part of the work is completed or nearing completion, much is still to be accomplished. The object is to get the mines in working condition for an output of about 500 tons per day this coming fall and gradually complete construction, along with the mine development, till the rated output of 5000 tons per day is reached.

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Opening South-China Coal Fields

There is a very fair prospect for the development of some of the coal fields of south China, says Consul General George E. Anderson in *Commerce Reports*, especially within Hongkong's trade territory, on a modern basis. At several localities along the West and North Rivers near Canton coal fields have been worked in native fashion for some time and the output has come to amount to a considerable volume.

An American mining expert has had occasion to look into one of these fields in the past few weeks, with a view to development along modern lines, and gives some facts of interest. The property examined is situated on the North River, about 160 miles from Canton, the actual mine being located about a mile from the river and on the right bank. The survey for the Canton-Hankow Ry. lines crosses the property which occupies broken ground, embracing two lines of hills of considerable height. The native workings are located from 800 to 1000 ft. up the side of one of these ranges and the seam has been followed down for about 400 ft. The seam runs about 9 ft. in thickness.

The native method of working is extremely wasteful and also extremely dangerous, even where the seam is as plainly exposed as it is in the case of the one worked. On this property there are three coal beds, one about 9 ft. in thickness, the second about 2 ft. in thickness and the third about 10 ft. in thickness. While owing to the broken nature of the country it is impossible to see whether or not there are faults in the seams, the general indications are that there are none.

The region is essentially coal country; the predominating rock is limestone intermixed with layers of sandstone and slates. Millions of tons of coal are actually in sight. The government analyst in Hongkong reports on the analysis of a sample of this coal that it contains 0.8 per cent. of moisture, 17.6 per cent. of ash, 20.7 per cent. of volatile combustible matter and 60.9 per cent. of fixed carbon. The percentage of sulphur is placed at 1.2 per cent., and the calorific value is 12,830 B.t.u. The ash is grayish white in color. The coke made from this coal is of hard behavior and burns with a fairly long flame.

The matter of transportation has been one of the chief factors in opening such mines. The North River, where these coal seams are found, is too shallow for successful water transportation, and there is no economical means of transport at this time. It is anticipated, however, that the Canton-Hankow Ry. line will be completed to this district in about two years at the present rate of progress. The completion of this line will not only immediately open up this coal field, but it will also make other fields available for the Hongkong coal market and for export.

The immediate need of these fields is modern machinery and capital. The capital needed for the development of the property examined is about $150,000 gold.

Western Rate Advance on Coal

SYNOPSIS—The recent decision of the Commerce Commission in the Western rate case makes a sweeping readjustment in coal freights. The tonnage affected aggregates more than 13 million. A general advance was granted except to South Dakota. Complete text of that part of the decision covering coal rates is given.

It is proposed by tariffs under suspension to increase the rates on bituminous coal from mines in Indiana, Illinois, Kentucky, Alabama, Missouri, Arkansas, Oklahoma, Kansas, Colorado, New Mexico and Iowa, and from the docks on Lakes Michigan and Superior when shipped to points in Western trunk line and Southwestern tariff committee territories. Some reductions are proposed and the increases are either 5 to 10c. per ton. The increased revenue is 5.36 per cent. of the present revenue on bituminous coal.

Scope of the Decision

By taking the reports for one week in May and one week in October, 1914, of the roads hauling 86.5 per cent. of the coal traffic involved, and multiplying the amounts so shown by 26 to obtain estimates for a full year, and by applying the same basis to the roads not reporting, the respondents give fairly accurate figures which show present rates, weighted haul, revenue per net and gross ton-mile, and average load. These show:

	12 Roads in Southwestern and Trans-Missouri Territory	15 Roads in Western Trunk Line Territory
Total mileage operated	34,607	49,780
Tons originated (estimated for the year)	4,628,702	8,951,956
Average weighted haul (miles)	256	327
Average rate per ton	$1.45	$1.50
Average revenue per net ton-mile (mills)	5.66	4.59
Proposed increase for 27 roads is (mills)	.26	.....
Average revenue per gross ton-mile (mills)	3.97	3.20
Proposed increase for 27 roads is (mills)	.18	.....
Proposed average rate per ton	$1.526	$1.581
Proposed increase per ton	0.076	0.081
Average net load per car for 27 roads (tons)	41.63	.....

Combining the two groups the percentage of increase is 5.36, the average weighted haul 303 miles, the average present rate per ton $1.483, and combining 90 per cent. empty haul, the revenue per gross ton-mile is 2.84 mills.

REPRESENTATIVE BITUMINOUS COAL RATES ON WHICH INCREASES ARE PROPOSED.

From	To	Distance, Miles	Present Rate per Ton	Proposed Rate Per Ton	Proposed Rate Per Net Ton-Mile, Cents
Peoria, Ill.	Des Moines	250	$1.70	$1.80	0.720
Peoria, Ill.	St. Paul, Minn.	462	1.50	1.60	.346
Peoria, Ill.	Huron, S. Dak.	649	2.55	2.65	.393
Duluth, Minn.	Woonsocket	524	2.55	2.65	.506
Duluth, Minn.	Aberdeen	458	2.55	2.65	.579
Girard, Ill.	Kansas City	305	1.80	1.90	.623
Centralia, Ill.	Madison, Wis.	337	1.40	1.45	.430
Milwaukee, Wis.	Chamb., S. Dak.	622	3.40	3.50	.563
Springfield, Ill.	Sioux City, Iowa	600	2.69	2.79	.465
Cornell, Kans.	Kansas City	139	.70	.75	.540
Pittsburg, Kans.	St. Joseph, Mo.	191	.90	1.00	.524
Pittsburg, Kans.	South Omaha	323	1.35	1.45	.449
Southern Ill. group	Alexandria, La.	645	3.82	3.92	.608
Southern Ill. group	Pine Bluff, Ark.	335	2.25	2.35	.701
Southern Ill. group	Brownwood	368	2.65	2.75	.747
Alabama mines*	Brownwood	820	4.80	4.90	.598
New Mex. Dawson	Brownwood	831	3.75	3.85	.463
Colorado, Trinidad	Brownwood	730	3.75	3.85	.527
Lehigh-Coal, Okla.	Brownwood	368	2.65	2.75	.747
McAlester, Okla.	Brownwood	434	2.65	2.75	.634
Calhoun, Okla.	Dallas, Tex.	388	1.25	1.35	.348
McAlester, Okla.	Winfield, La.	426	2.25	2.35	.552
Hartford Ark.	Altus, Okla.	430	2.35	2.45	.570
Hartford, Ark.	Oklahoma City	207	1.45	1.55	.749
Trinidad, Colo.	Amarillo, Tex.	256	2.75	2.85	1.113

* Distance from Birmingham, Ala., as given in W. W. Miller Exhibit 4.

Rates have been so adjusted by the carriers that mine operators in the general territory may sell their output in common markets. To do this, rates from the mines located at the greater distances must be accorded rates which yield less per ton-mile than the rates from the nearer mines. In other cases the necessity of maintaining rates at intermediate points no higher than rates to the terminal point makes rates to intermediate points lower than rates to points for similar distances where the rule of the fourth section does not apply. The preceding table shows representative rates, present and proposed, and the revenue per net ton-mile which the proposed rates would yield.

It is estimated by a witness for the respondents that the ratio of empty to loaded mileage is 90. On the St. Louis & San Francisco road from May 1 to Dec. 1 in 1914 this ratio was by actual test 94.79; on the Chicago & Alton the ratio for one year was 82.2; while the average is given as 89.

Some Peculiarities of Coal Traffic

That trainloads are not hauled in the southwest appears from a table showing the average daily production for December, 1914, of mines on the St. Louis & San Francisco R.R., which may be accepted as representative of the section, as follows:

District	Output (cars) Company	Output (cars) Commercial	Output (cars) Total	Total Working Days	No. of Mines	Average No. of Cars per Mine per Day
Alabama	710	3069	3,779	25	31	4.88
Arkansas	330	522	852	25	16	2.13
Southeastern Kansas	1099	3940	5,039	25	95	2.12
Missouri	66	244	310	25	5	2.48
Oklahoma	559	531	1,090	25	16	2.73
Total	2764	8306	11,070	25	163	2.72

While no such definite information is given as to the Western roads, comparing the mileage operated with the tons originated, as shown in the table first above, it is deducible that there can, on the average, be little trainload movement in this territory.

Coal mines are usually located off the main line of the carriers, thus necessitating a switching movement to and from the mines of an average of over a mile; cars when placed on tracks leading to the mines earn no demurrage; the average tare weight of the car is about 18.5 tons; and the average weight of the load is about 41 tons.

Bituminous coal is not stored at the mines, but is loaded as mined; and because of this and the resulting facts that cars are sometimes ordered and not used, and sometimes loaded and not immediately billed out, and that diversion in transit is necessary in order that coal may be delivered when and as needed, cars in this traffic are kept in use for a longer time, compared with the distance hauled, than is true of the average of other traffic. The cost incident to the assembling and diversion of coal is material, but the exact measure thereof cannot be determined from this record. As pointed out in the general discussion of the carriers' financial situation, there has been a constantly increasing cost of maintenance of these heavy coal cars, a cost augmented by reason of the injury caused by these heavy cars to other lighter equipment.

Between the month of lowest and the month of highest density of this traffic there is a difference of 89.73 per cent.—greater than the difference between the maximum and minimum tonnage of any other particular kind of traffic. This variation indicates that the movement is seasonal; and the fact that miners' contracts are renewed biennially, causing uncertainty in the production, makes for heavy fluctuations in the volume of traffic; and "although a full car supply cannot be expected all the time, carriers must do more than to provide themselves with sufficient equipment for the slack period of coal production." (Vulcan Coal & Mining Co. vs. I. C. R.R. Co., 33 I. C. C., 52, 71 and cases cited.)

The Classification of Coal

That coal loads heavily and that the loss and damage is but nominal offset to some extent the special costs incident to this traffic; coal is of low value, and the value of the particular commodity has always been regarded as a material fact to be considered in determining the rate. On this subject, in Investigation and Suspension Docket 26 to 26C, Rates on Coal, 22 I. C. C., 604, 623, 624, we said:

> If a carrier may raise all rates to a basis where each will bear its share of cost, including all costs, and no lower rate is reasonable, then it must follow that all rates are unreasonable which yield to the carrier a greater return than such cost. Under such theory what would be the rate on tea or silks, or high-priced horses, or delicate machines? Is there to be no classification of freight excepting upon the basis of cost of transportation plus insurance risk? If so, the tariffs of every railroad in the United States must suffer a revolutionary change. In all classification consideration must be given to what may be termed public policy, the advantage to the community of having some kinds of freight carried at a less rate than other kinds. And this is the true meaning of the phrase "what the traffic will bear." It expresses the consideration that must be shown by the traffic manager to the need of the people for certain commodities. He accordingly imposes a higher rate upon what may be termed luxuries as compared with that imposed upon those articles for which there is a more universal demand. He also gives consideration to the fact that the rate so imposed enters into the ultimate price to the consumer to but a small degree when the article is one of high value, and that those in the community who can afford to purchase such articles can well afford to pay a rate greater than that which could reasonably be imposed upon the general public for commodities of common use. In this sense what the traffic will bear and the value of the service are analogous. . . . We may not say that a rate shall be fixed so as to meet the requirements or needs of any body of shippers in their efforts to reach a given market, nor may we establish rates upon any articles so low that they will not return out-of-pocket cost. Neither could we fix an entire schedule of rates which would yield an inadequate return upon the fair value of the property used in the service given. There is, however, a zone within which we may properly exercise "the flexible limit of judgment which belongs to the power to fix rates." These are the words of the Chief Justice of the Supreme Court, 206 U. S., 26. There is no flexible limit of judgment if all rates must be upon a level of cost, and out of every dollar paid to the carrier must come a fixed amount of return for capital invested.

To the same effect see Union Tanning Co. vs. S. Ry. Co., 26 I. C. C., 159.

Coal mined in the states here affected has increased in value but little since 1904. The price, except in the states of Alabama and Kentucky, is given for the years 1908 to 1913 in the subjoined table:

AVERAGE SELLING PRICE, ALL COAL FROM MINES IN STATES SHOWN, 1904 TO 1913, INCLUSIVE

(Taken from bulletins, "Production of Coal," by Edward W. Parker, United States Geological Survey)

State	1908	1909	1910	1911	1912	1913
Illinois	$1.05	$1.05	$1.14	$1.11	$1.17	$1.14
Indiana	1.06	1.02	1.13	1.08	1.14	1.11
Missouri	1.64	1.65	1.79	1.72	1.76	1.73
Iowa	1.63	1.65	1.75	1.73	1.80	1.79
Kansas	1.49	1.44	1.61	1.53	1.62	1.67
Oklahoma	2.03	2.00	2.22	2.05	2.14	2.05
Arkansas	1.68	1.48	1.56	1.61	1.71	1.76
Colorado	1.41	1.33	1.42	1.45	1.49	1.52
New Mexico	1.37	1.29	1.39	1.44	1.42	1.46

A shipper gave the prices paid by five railroads for their fuel coal 1910 to 1914 as somewhat higher than the prices shown in the foregoing table; and it appears that one of the carriers is paying the same for coal as in 1910, two slightly more, and two slightly less.

The relative density of all traffic hauled by representative eastern and western roads appears from the following table:

FOR YEAR ENDED JUNE 30, 1914.

Eastern bituminous coal originating roads:	Average Miles Operated	Freight Revenue per Mile of Road	Tons of Freight Carried 1 Mile per Mile of Road
Pennsylvania Co.	1749	$25,518	4,448,369
Pennsylvania R.R.	4083	31,407	5,430,286
Baltimore & Ohio	4478	16,922	2,997,966
Hocking Valley	351	15,935	3,742,321
Norfolk & Western	2035	18,683	4,497,010
Chesapeake & Ohio	2345	12,305	3,011,617
Buffalo, Rochester & Pittsburgh	581	15,742	3,405,126
Toledo & Ohio Central	446	9,817	2,366,937
Kanawha & Michigan	176	15,031	3,739,955
Bessemer & Lake Erie	204	38,903	8,564,706
Pittsburgh & Lake Erie	223	67,925	9,043,294
Unweighted average	......	$21,625	4,100,550

FOR YEAR ENDED JUNE 30, 1914.

Western and Southwestern bituminous coal originating roads:			
Atchison, Topeka & Santa Fe	8345	$7139	706,150
Chicago & Alton	1033	8595	1,417,388
Chicago, Rock Island & Pacific	7729	5478	639,184
Chicago & Eastern Illinois	1283	8825	1,724,429
Chicago, Burlington & Quincy	9139	6871	942,339
Chicago & North Western	8070	6689	771,930
Chicago, Milwaukee & St. Paul	9683	6739	834,338
Chicago Great Western	1496	6645	911,648
Illinois Central	4768	9200	1,633,461
Minneapolis & St. Louis*	1646	4338	516,390
Wabash	2514	8032	1,320,933
Cleveland, Cincinnati, Chicago & St. Louis	2187	10,337	1,896,495
Vandalia	910	8326	1,275,451
Chicago, Terre Haute & Southeastern†	373	5109	887,354
Missouri Pacific	3919	4972	609,465
St. Louis, Iron Mountain & Southern	3364	7282	926,024
St. Louis & San Francisco	4746	6037	613,127
Missouri, Kansas & Texas	3824	5288	483,838
Kansas City Southern	827	9963	1,284,810
Colorado & Southern	1127	4986	481,034
Midland Valley	380	2745	226,229
Missouri, Oklahoma & Gulf	334	2623	350,095
Unweighted average	......	$6789	881,642

* Passenger mileage operated, 1585 miles. † Passenger mileage operated, 207 miles.

That the production of coal in the territory involved has regularly and considerably increased since 1900 is sufficiently illustrated by the subjoined table giving the production for 1900 and 1913:

PRODUCTION OF BITUMINOUS COAL IN STATES COVERED BY WESTERN ADVANCE CASE

(From Coal Statistics, by Edward W. Parker, Coal Statistician, Department of the Interior, United States Geological Survey)

	1900	1913
Arkansas	1,447,945	2,234,107
Oklahoma	1,922,298	4,165,770
Kansas	4,467,870	7,202,210
Missouri	3,540,103	4,318,125
Iowa	5,202,939	7,525,936
Indiana	6,484,086	17,165,671
Illinois	25,767,981	61,818,744

The present rates in the Southwest including rates from New Mexico and Colorado to Texas are generally lower than in 1906 and 1908. Rates on slack coal less than those on lump coal were established in this general territory about 1905, and this has resulted in a material increase in the value of slack coal. To the Missouri River rates have fluctuated since 1904, though except for the fact of the establishment of rates on slack coal they are now somewhat higher than then. The proposed rates from the mines to South Omaha show large increases over former rates. When applied to the weighted average on the shipments of one large shipper they yield only 4.34 mills per net ton-mile.

The rate to the "Twin Cities," which is the designation given St. Paul and Minneapolis, from the southern Illinois group of mines is a base rate, and rates to Wisconsin, Iowa, Minnesota and South Dakota are somewhat influenced thereby. This rate to the twin cities has been competitive with the rates from Duluth and has undergone many changes. In 1887 the rate was $2 per ton; in 1889, $1.75; in 1892, $2; in 1896, a rate of $1.62½ was established, but one road having made the rate $1.50, that became the rate for all roads. In 1899 an increase was made to $1.65; in 1902 there was a reduction to $1.40; in 1903 an increase to $1.50, and in 1904 a decrease to $1.40. The $1.40 rate remained effective until, in obedience to an order of this commission requiring a rate to the twin cities no higher than to intermediate points, the carriers increased the terminal rate of $1.50. This increase was sustained by us in Daly Coal Co. vs. C. & A. R.R. Co., 33 I. C. C., 467. In the present case it is proposed to increase this rate to $1.60. We are of the opinion that the territory affected should properly be considered as one. So considered, while there have been fluctuations, the present rates are no higher than they were 10 years ago.

Rates to the Southwest

It has been shown that for the weighted average for a haul in the Southwest of 256 miles, the present rate is $1.45 a net ton, and yields a revenue per net-ton-mile of 5.66 mills. In the Western trunk line territory the average haul is 327 miles, the rate $1.50 per ton, and the revenue per net ton-mile 4.59 mills. In Okla. & Ark. Coal Traffic Bureau vs. C. R. I. & P. Ry. Co., 15 I. C. C., 216, 223, decided June 24, 1908, we gave a table of state commission rates showing for a haul in Texas and Oklahoma of 250 miles a rate of $1.65 and a revenue of 6.6 mills; for Illinois and Iowa for 300 miles, rates of $1.20 and $1.50, and revenues of 4.2 and 5 mills, respectively. Speaking of Southwestern coal rates, we there said:

> As affecting the traffic here involved we regard these rates as somewhat too low, especially for the shorter hauls, in view of the grouping policy adopted by the carriers by which many of the mines in a single group, although at some distance apart, are brought into competition upon a parity as to railroad charges in supplying the fuel needs at a single point of destination.

In that case we prescribed rates to specific points higher than the average of rates here proposed. Against an average haul of 256 miles and a rate of $1.526 a ton on all coal here proposed, we prescribed in this same territory a rate for 228 miles of $2.25 per ton on lump coal and $1.65 on slack coal. Weatherford Chamber of Commerce vs. M., K. & T. Ry. Co., 31 I. C. C., 665.

Our attention has been particularly called to the proposed rates on lump coal and coke of $2.85 and on slack coal of $2.35 per net ton for 256 miles from Trinidad, Colo., to Amarillo, Tex. This rate is high as compared with the average rates proposed, but the movement is in a territory of sparse traffic. In Amarillo Gas Co. vs. A., T. & S. F. Ry. Co., 13 I. C. C., 240, we prescribed a rate for this haul on coke of $2.90 per ton, the rate on coal then effective.

For hauls ranging from 58 to 563 miles in a territory where traffic is light we found that rates which applied to the actual movement yielded from different mines a revenue per net ton-mile of 10.06, 8.74, and 8.18 mills, respectively, were not shown to be unreasonable. Public Utilities Commission of Idaho vs. O. S. L. R.R. Co., 33 I. C. C., 103. In 1909 we held that a rate from Chicago to Fort Dodge, Iowa, for 375 miles that yielded slightly less than 5 mills per net ton-mile was "certainly not a high rate." Fort Dodge Commercial Club vs. I. C. R.R. Co., 16 I. C. C., 572, 582.

The comparisons here used may not be altogether persuasive, but they are probative, and tend to establish that the increased rates here proposed are just and reasonable. The maximum increase suggested is 10c. per ton, while the average increase is less than 8c. per ton.

High Rates to Dakota Points

Rates to South Dakota yield revenues per ton-mile somewhat higher than those yielded by the average of the rates involved. Specific rates referred to by a witness for protestants show ton-mile earnings ranging from about 3½ to 6 mills. The actual weighted average from the statistics of the Burlington is as follows:

Point of Origin	Distance, Miles	Revenue per Net Ton, Cts.
Illinois	512	4.76
Manitowoc, Wis.	689	4.01
Milwaukee, Wis.	592	4.48

Where deliveries were made on connecting lines the revenue was less than stated in the table above. The coal for South Dakota usually moves in box cars and consequently shows a less empty mileage and a lighter load, the load averaging 28.5 tons.

Rates on coke in Southwestern territory are published in coal tariffs, and coke takes the same rates as coal. It is only in this territory where coke and coal rates are increased generally that coke rates are involved in this proceeding. Coke loads lighter than coal, and there is no transportation reason why rates thereon should be lower than on coal. Slack is fine coal used principally in furnaces, and to some points rates have been accorded on slack lower than on lump coal. Facts showing a justification of increases in the lump coal rates equally justify a corresponding increase in the rates on slack.

Pittsburgh vs. Illinois Coal in the Northwest

From lake ports in Wisconsin and Minnesota to intrastate points in those states no increase is proposed in the rates on dock coal. The like situation exists in intrastate rates from mines in Iowa, Missouri, Kansas, Arkansas, and Oklahoma. It is claimed that injury will result to the coal miners of Illinois unless increases in coal rates are made from the dock commensurate with the proposed increases from the mines in that state. Illinois coal is said to be somewhat less attractive to users than is coal from the Pittsburgh district, but the Illinois coal can be sold more cheaply than the Pittsburgh coal. Details of the cost of each at the representative consuming markets of St. Paul and Minneapolis were shown by protestants in a table here inserted.

The following is a comparison of prices for coal delivered at St. Paul and Minneapolis, the largest coal markets west of Chicago:

FROM PITTSBURG, PENN., DISTRICT

Coal at mines	$1.25
Average freight charges to Lake Erie ports	.75
Loading to vessel	.05
Lake freight Erie to Superior	.32
Dock charges at Superior and Duluth	.40
Freight from Superior and Duluth to twin cities	.96
Total	$3.73

ILLINOIS COAL

Average selling price at mines (10 years)	$1.10
Present average freight charges from state of Illinois	1.93
Total	$3.03
Margin to cover difference in quality	$0.70

From other facts of record it appears that past increases in rates from Illinois without corresponding increases in the rates from the docks have resulted in relatively lessening the amount shipped from the Illinois mines. Since the rates from the docks at Milwaukee to points in Wisconsin and rates from Duluth to the twin cities remain unchanged, some carriers maintain existing related interstate rates.

INCREASED RATES TO SOUTH DAKOTA NOT ALLOWED

To South Dakota destinations an increase of 10c. per ton is proposed in the rates on bituminous coal from Lake Michigan and Lake Superior ports, as well as from Illinois mines. No increase is proposed from any of the lake ports to Minnesota destinations. The present rates from the lake ports to South Dakota destinations are on a higher per ton-mile basis than rates to intermediate destinations in western Minnesota. An increase in the rates to South Dakota destinations unaccompanied by a like increase in the rates to Minnesota destinations would accentuate the existing violation of the general principle that the ton-mile revenue should decrease with increased distance. The present rates to South Dakota destinations appear to be on a higher basis than to other Western destinations, although the greater part of the haul is through the lower-rated territory. For these reasons the increases proposed to South Dakota destinations have not been justified.

From the facts of record we are of opinion and find that, with the exception of rates on coal to points in South Dakota, the proposed increased rates on coal have been justified, and the orders of suspension relating thereto will be vacated.

Des Moines, Ia.—Iowa coal operators feel that the increased rates on bituminous coal, granted the railroads by the Interstate Commerce Commission, will be of benefit to them inasmuch as short hauls will give them an advantage over outside companies. Considerable business in northern Iowa especially has gone to outside companies. More than 22 per cent. of the total railway tonnage in Iowa is bituminous coal.

*

"Extracts from a Superintendent's Diary"

It is hard to realize the almost universal appeal that music possesses unless some unusual event draws our attention to it.

We have experienced such an unusual event in our camp during the past week, and in future I intend to make good use of the experience gained.

One of my wife's cousins, a young lady with a magnificent singing voice, spent the week with us; and because she delights to sing whenever she feels that her singing is appreciated, we had opportunity to hear almost her entire repertoire.

Twice during the week, at night, almost the entire population of the camp gathered around our house, attracted by her singing, and on the last night of her visit she went out on the veranda of the house and sang a number of songs for the sole pleasure of those who were on the outside. It was there that I was reminded of the all-prevailing power and charm of music.

From my position on the veranda, back in the shadows, I could see plainly all that was going on and no one could see me. The possibilities of such an opportunity to watch unobserved the emotions of men is quite uncanny, and my experience was entirely in keeping with the possibilities.

The song that made the deepest impression was, "Home, Sweet Home." Mining-town homes are not average homes, at least not in our country. They are at best only temporary homes, and there can be few ties binding their occupants to them. Children and grandchildren do not return to them because of any sentiment that is supposed to attach to the place of one's birth. It would even be difficult to find a mining-town home that had been occupied for a long-enough period continuously by any one family to be called the birthplace of all of the children of that family.

One may be pardoned for wondering then why "Home. Sweet Home" should make such an impression on our men.

But there was no mistaking the appeal. During the singing of the song, the interest was so intense that a deaf stranger passing, seeing their faces, without being conscious of the music, might easily have been led to believe that the entire crowd was under some strange hypnotic spell. And in reality he would not have been so very far from the truth.

After the song had died away, almost every one in the audience, as if by common impulse, came up to tell the singer how much the singing had been enjoyed, and in the manner of the telling was evidence of the deep emotion that had been aroused.

While they were still under the spell, someone in the audience suggested that Tim McDougal give a song and allow the lady to rest. Tim responded instantly, and his song was well received, much to the surprise of everyone present, because Tim was not much of an artist at best, and singers are supposed to suffer by comparison.

But Tim's success was not the only surprise of the evening. Old grudges seemed to be forgotten, neighborhood quarrels seemed to have lost their meaning, and distinctions of birth and salary meant nothing at all to the crowd while under the spell of music.

Everyone seemed to be so thoroughly happy that there was no place for any unpleasant thoughts, and when the music came to an end everyone in the audience went off smiling.

I am going to arrange matters in the future so that the musicial talent in our village will have an opportunity to express itself and demonstrate its value to our community.

*

Watch Wires Used in Blasting

The increasing use of electric blasting and of larger charges emphasizes the importance of watching the condition of all leading and connecting wires and blasting machines to see that they are kept in good condition and that connections are well made.

Avoid kinking wires, as this leads to cracks and breaks not easily detected through the insulation. Don't drag wires over the ground, as this scrapes off the covering. Test the blasting machine with the rheostat at regular intervals to see that it is working up to capacity. Test all circuits with the galvanometer before attempting to blast and thus make sure that the insulation is perfect.

Coal Industry of Natal

One of the leading industries of Natal is that of coal mining, says *Commerce Reports,* and as in all other enterprises this showed a slight decrease in the output for 1914 over the preceding year. The decrease was not due altogether to the war, although that was the greater reason. Labor trouble in the early part of the year 1914 caused an almost entire cessation of railway traffic for about a month and interfered with the running of the mines.

There are 21 coal-mining companies in this district, with a total output last year of 2,316,665 tons, a decrease from the year 1913 of 281,743 tons, as the output for that year was 2,608,408 tons. This output for 1913 was the largest ever experienced, while the yield of 1914 shows a drop from the preceding two years. The output of the local mines in 1910 was 2,296,687 tons; for 1911 it was 2,394,338 tons, and for 1912 it was 2,472,085 tons.

A considerable quantity of this coal is used in the district, but the greater portion is sold for export and for bunker coal, the latter being the largest industry. The bunker coal taken on vessels for fuel last year amounted to 948,000 tons, a falling off of 66,000 tons from the year before, which amounted to 1,014,000 tons, a comparatively small decrease. But in coal exported the falling off was much greater, 42 per cent., as the coal exported last year was only 355,000 tons, while for the year 1913 it was 615,000 tons.

⁂

Coal Deposits in Sweden

Dr. Edward Erdmann, state geologist of Sweden, has made investigations regarding the coal area in the province of Scania, says Consul Emil Sauer in *Commerce Reports,* and according to his report the coal deposits there are calculated to amount to 106,500,000 tons.

The rate of mining the last few years has been only about 300,000 tons per annum. The annual consumption of coal in Sweden amounts to over 4,000,000 tons, and the domestic production supplies only about 7 per cent. of this, while the balance, or 93 per cent., must be imported from abroad.

⁂

Keeping Conveyor Belt Records

A new method of recording the cost of various conveyor belts in operation has been worked out by the B. F. Goodrich Co., of Akron, Ohio, in the interest of all belt users.

Ordinarily, accurate costs are rather difficult to determine, and many people have not the time to work out an adequate system for making computations. The use of various belts, however, is an important factor, and many a dollar can be saved when it is known where to cut down the tonnage cost.

The card record in question, which is mailed free on application by the Goodrich company, is simple, but most efficient. It will help to stop the small leaks where profit continually slips out.

Forty-six years of experience naturally gives this concern a wealth of material from which to formulate ideas. The development of these ideas, however, is not a secret, and their arrangement on the record card is purely a service to the belt user which cannot help but be beneficial.

Specifications for the Egyptian Railway Contract

The specifications for the Egyptian State Railways and Telegraphs contract are an interesting example of foreign practice. The contract involves 360,000 metrical tons (354,310 gross tons) of either Welsh or American screened steam coal. Bidders must use form attached to the official "specification." It is provided that Welsh coal must be furnished from certain specified collieries only, and American coal must be suitable for locomotives, to contain about 35 per cent. and not over 40 per cent. volatile and about 6 per cent ash, both on the dry basis. Analysis must be submitted with the proposal, the collieries and seams named and certificates furnished. Each cargo is to be judged by a sample taken at the loading port by the administration's inspector. For more than 2 per cent. ash in excess of the percentage established in the contract 4c. will be deducted for each 1 per cent. or fraction thereof. Prices are to be quoted in British currency per metrical ton (equivalent to 2204.6 lb. avoirdupois). Bidders may quote by telegrams, provided the tender has been sent by mail, the space for prices being left blank. Two per cent. of the total value must be deposited as "earnest money," this to be increased to 10 per cent. if the tender is accepted.

On Welsh coal, prices are to be f.o.b. administration steamer at loading port, and on American coal delivered free at railway quay, Gabbary, Alexandria, custom dues only are excluded. The steamer is to pay 6c. per gross ton for stevedoring at Alexandria, besides providing steam, etc., in accordance with Welsh Coal Charter Party.

Deliveries are to be made from Sept. 1, 1915, to Apr. 30, 1916 in the case of Welsh coal f.o.b., and from Oct. 1, 1915 to May 31, 1916, delivered in the case of American coal, about in monthly proportions, but the administration has the option of increasing any monthly quota up to 30 per cent. or dividing the contract according to a prescribed table, the unit of shipment being 5000 tons, or one shipload. There is also a rigid strike clause and a provision that the buyer may purchase for the account of the contractor in case of delays.

On American coal none is to be shipped except in holds with at least 12x12-ft. hatchways and not between decks. Steamers must not be over 415 ft. long and loaded draft not over 25 ft. on arrival at Alexandria. Guaranteed rate of discharge is to be 700 tons per working day. Contractors are to make all necessary arrangements for payment of freight. Settlements are to be made by check on London in full on discharge.

⁂

Coal Storage at Sewall's Point

The accompanying photographs show the huge coal yards at Sewall Point, near Norfolk, Va., where a mountain of coal estimated to contain nearly a million dollars' worth of fuel is piled for shipment. This stored coal sometimes becomes overheated and catches fire from spontaneous combustion, so that great care must be exercised to prevent these losses by fire. A body of guards are constantly on duty ready to check in the incipient stage any flames that may start. The coal piles shown are maintained by the Virginian R.R.

STORED COAL AT SEWALL POINT, VA. GREAT CARE IS NECESSARY TO PREVENT FIRES

SOME OF THE MEN EMPLOYED TO FIGHT FIRES AT THE SEWALL POINT YARDS

The Labor Situation

SYNOPSIS—The miners in eastern Ohio believe that when the mines are idle the officials should receive strike benefits, but no wages. Ohio miners contend that they are victims solely of the high railroad rates, but the operators claim that both wages and freight rates are to be blamed. In Colorado J. R. Lawson obtains a supersedeas. In Illinois a union water supply is barred from a nonunion washer, and violence is attempted against a coöperative mine.

On Aug. 11 the miners of subdistrict No. 5 of the United Mine Workers of America in Ohio met in convention. This subdistrict, it will be remembered, covers eastern Ohio. The report of Secretary-Treasurer William Applegarth was read to the convention. It showed that four local unions had been abandoned, three had been organized and seven exonerated from paying tax. On Feb. 28, 1915, the date up to which the report extends, only $500.60 was in the treasury.

C. J. Albasin, the president, had received during the year $843 as salary. His expenses had been $687.38. The salary of Vice-President William Roy had been $1074.75 and his expenses $685.31. William Applegarth received $1128.20 as salary and $257.42 for expenses. These payments seem quite reasonable awards to the men who have put up the long though losing fight for the miners in eastern Ohio, but of course compared with what the miners have been receiving meanwhile it is a plethora of wealth, and the statement of the moneys they received aroused much feeling.

Union Leaders to Receive Only Strike Benefits

The miners passed a resolution prescribing that the salaries of the officers shall cease when the whole of the subdistrict is on strike and that they shall then receive their expenses and strike benefits in the same manner and in the same amounts as the miners thus suffering from idleness. The miners can by no means discover a more certain way of assuring themselves of defeat. As soon as a strike occurs the leaders will be prone to seek a settlement, for it would cost them nothing if the miners failed to win. All kinds of discontent will arise between the leaders and the men. Among other matters it was noted in the report that the union paid out $38,000 for shoes.

Extremely creditable was the disinclination of the union to let Homer Wilson take office. He had been serving as a bartender, and the constitution forbids any member to handle intoxicants. Wilson probably needed the money to support his family, and so was less subject to censure, and eventually was allowed to take a seat in the convention. The U. M. W. of A. does well to take a strong stand on the temperance question.

No Benefits for Idlers and a 5 per Cent. Tax

Some of the members who were working had been receiving benefits and some of the beneficiaries have failed to take work when it is offered. It was decided that such men should be suspended until they paid back all benefits thus improperly paid. The working members of the union in eastern Ohio will be required to pay 5 per cent. of their earnings toward the support of those out of work. There are 4000 of these idle men. Resolutions were passed against coöperative mining. Men so engaged were classed as mine operators. They are to be fined $100 and suspended for six months.

The miners at the Blaine mine of the Lorain Coal & Dock Co., one of the largest mines in eastern Ohio, located near Bridgeport, have gone on strike for the third time in two weeks. The men resent the fact that scales have not been installed to weigh run-of-mine coal as agreed, and they can hardly be blamed for their frequent and determined protests. They are clearly entitled to the scales and the run-of-mine method of weighing.

Only the Sunday Creek Co. Has Entirely Closed Down

In the Hocking Valley field conditions are not nearly so bad as have been represented. It is true that the Sunday Creek Co. has closed down its mines completely, and it is by far the leading company in that region. But according to a report submitted to the freight department of the Hocking Valley Ry. on Aug. 11, 40 of the 68 mines served by the road were then in operation. These were running either steadily or part time, and together averaged a total of 200 cars of coal a day. That is only five cars per mine—at most 250 tons, and probably much less. However, as the mines are small the tonnage shows considerable activity.

The brunt of the case against the Hocking Valley Ry. is being borne by the Sunday Creek Co., and it is felt that the idleness is only in part due to a lack of orders for coal. The Sunday Creek Co. is suspected by some persons of trying to fortify its argument by closing its mines. The New Pittsburgh Coal Co. has three of its five mines working; the Manhattan Coal Co. five out of eight; while the York Clay & Mining Co. has two mines and is working only one.

The North Hocking Coal Co. and the Standard Hocking Coal Co. have two mines each and all are working. The Hocking Block Coal Co. has three mines, all in operation. Out of 37 mines individually owned or coöperatively mined, 24 are running and 13 are closed. The Sunday Creek Co., with nine mines, is the only concern of any importance not operating at all.

Col. E. S. Bryant has promised to look into these figures. He could see no reason why a single company should be the only one unable to operate even part time. Especially does the idleness appear unnecessary when it is recalled that most of the mines in the Pomeroy district and in eastern Ohio are also operating.

Some of the Men Show Little Inclination to Work

In face of the continued refusal of the general public to get excited about the miners' situation, the adjutant-general's department is considering another method for relieving conditions. They have come to the conclusion that the man who refuses work to support his family should be prosecuted and sent to the stone pile.

A case at Corning, Perry County, gave rise to this trend of thought. Work in a brickyard, where some shale had to be blasted out, was offered to a miner who was in the habit of handling explosives. After he had been at work for several hours a representative of the union came along and inquired what the job paid. He was told $2 a day. He refused to allow the man to continue at work for that pay.

It is the opinion of state officials that such a man, unless he has other means of keeping his family, can be prosecuted for nonsupport. He will be cut off from receiving state aid.

Interstate Commerce Commission Will Do Nothing

Several Ohio operators and their attorneys recently conferred with the Interstate Commerce Commission at Washington, D. C., and pressed for a complete readjustment of coal rates in the Middle West. A number of railroads engaged in carrying coal were represented at the conference and operators in other states were also present.

The commission was loath to open the question which might involve a readjustment of rates throughout the country. It refused to arrange for a further conference on the matter. J. H. Winder and E. C. Morton, general manager and attorney, respectively, for the Sunday Creek Co., and W. K. Field, president of the Pittsburgh Coal Co., which holds the stock of the New Pittsburgh Coal Co., were among those attending the conference.

But despite the attempts to induce the Interstate Commerce Commission to grant lowered freight rates, the Sunday Creek Co. is pressing for relief from the Ohio Utilities Commission and has obtained subpœnæ duces tecum for all the records of the Hocking Valley Ry. bearing on the cost of transporting coal and assembling coal trains. Accordingly, on Aug. 17, when the Utilities Commission reconvened, the Hocking Valley Ry. presented several drayloads of undigested records. They could have supplied the summaries as worked out in detail by the auditing department of the railway company, but failed to do so.

It would require a whole year for experts to wade through the testimony furnished. The Ohio Utilities Commission appointed the men originally employed by the Sunday Creek Co. and Beman Thomas, a local accountant, as examiners. The railroad objected to its own accountants being used, saying they were biased, but the commission persisted in its course and an injunction was threatened by the attorneys for the railway company to prevent the experts from examining the books. It was claimed that application for the injunction would be made in the Ohio Supreme Court, but up to Aug. 21 no such action had been taken.

The Sunday Creek Co. filed an amended intervening petition asking that the investigation be extended to both the Toledo & Ohio Central and the Zanesville & Western Ry. The petition in the case of these roads is the same as originally filed by the U. M. W. of A. officials against the Hocking Valley.

John H. Winder, general manager of the Sunday Creek Co., announced that eastern Ohio operators have promised to enter the case soon. Thus all the coal freight rates in Ohio will be subjected to inquiry. On the other hand, the railroad companies will probably identify themselves with the cause of the Hocking Valley, and a battle-royal is promised.

After the appointment of the special examiners to go over the records of the railroad company the hearing was adjourned until Oct. 5. At that time it is hoped that the data desired by the attorneys for the coal company and the miners will be secured. These data relate to the costs of assembling trains, of transportation proper and of maintaining switching and terminal facilties.

The operators are determined, however, that the question of freight rates shall not be allowed to hide the important difference in wage scales existing between Ohio and West Virginia, which they feel is crowding the Ohio market to the wall. It is not the difference in the cost at the market which alone pinches; the cost at the mine is also in controversy.

The Difference in Wage Scales in Neighbor States

Walter R. Woodford, of the Rail & River Coal Co., with mines at Bellaire, has given out a statement saying that the price at the mine of West Virginia mine-run coal is 70c. per ton or even less. Mine-run in Ohio costs the operators 95c. per ton under normal conditions. He gives the following comparative scale after increasing the day rates in the Ohio region one-eighth so as to put the 8-hr. day rates on an even basis with the 9-hr. day scale of West Virginia:

	No. 8 Seam, Ohio	Kanawha, West Virginia
Pick mining	$0.678	$0.49
Machine loading	.39	.26
Machine cutting	.08	.065
Water haulers	3.195	2.05
Motor and machine runners	3.195	2.55
Tracklayers	3.195	2.43
Trackhelpers	2.93	2.00
Trappers	1.39	.89
All other inside day labor	2.93	2.00

These figures and others like them are making much stir in West Virginia, and statements are made to show that gross freight rates are higher from the West Virginia field than from Ohio, and that the West Virginia coal wins on its superlative merits. Moreover, it is said Ohio is a farming state and doesn't need any mines to secure its prosperity. West Virginia without mines would be a wilderness, whereas Ohio would be little the worse.

The mines in Ohio are said to be poorly equipped compared with those in West Virginia and are sinking gradually to a decline. This is doubtless true; but the inefficiency is not the cause of the misfortunes of the field, but rather the effect of higher wage scales as well as thinner, poorer coal and unfair freight rates.

Mr. Woodford questions the right of the state to ship men from the Hocking Valley to Cleveland to work on the streets and in other places at $1.75 per day when they refuse or are not permitted to work for an operator in Ohio at less than $2.62 or $2.84 per day.

Colorado Supreme Court Fails to Support Judge Hillyer

The Colorado Supreme Court has granted a writ of prohibition preventing Judge Granby Hillyer, of the Third Judicial district, from hearing the case against three men charged with murder in the Colorado coal strike. At the same time a writ of supersedeas was granted upon the application of John R. Lawson, international board member of the United Mine Workers in America, who had been assigned by the union to work in Colorado. He had been tried before a jury and found guilty of murder, being sentenced to life imprisonment. Justice S. Harrison White wrote the writ of prohibition, Justices Hill, Teller, Scott and Bailey concurring. Chief Justice Gabbert and Justice Garrigues dissented, but presented no written opinion.

The effect of the writ may be to prevent Judge Hillyer from trying any further cases. Two of the men he is not permitted to try are John Burke and Charles Haines, accused of killing Maj. P. P. Lester, of the National Guard during the battle of Walsenburg on Apr. 29, 1914. The third case is that of K. Uyada, a former striker accused of murder.

Hillyer for a Short Time a Company Attorney

Judge Hillyer before being placed on the bench by Governor Carlson appeared and argued in four strike cases, acting on behalf of the operators. The court felt that this might bias him in his judgments and may have prejudiced him in the trial of Lawson, even though he may have been honest in his determination to give the accused a perfectly fair trial. But it must be added that the employment of Judge Hillyer as an attorney for the coal companies was extremely brief. At one time the U. M. W. of A., through Horace N. Hawkins, desired to retain him, but he had given his word to Judge Northcutt that he would not accept a retainer from anyone else, though no names were mentioned as to the parties for whom Northcutt was retaining Hillyer.

Editorial reference will be made next week to the injunction proceedings in West Virginia and the anthracite region of Pennsylvania. These were brought to secure the freedom of speech and action on the part of members of the union who find that they are at variance with their paid leaders and representatives. In Pennsylvania, Thomas Butler ventured to take a stand on the mine-foreman certificate law different from that labeled orthodox. An attempt was made to dispossess him, and this the court has temporarily frustrated.

A New District No. 30 Erected by Disgruntled Union Men

Three locals out of four at Boomer, W. Va., have left the old district organization and formed a new district, which they have named District No. 30. They demand of the Boomer Coal Co. that the check-off be paid to them, and they have obtained an injunction restraining the company from paying the money to the officials of the old district.

The old union District No. 17 having so fiercely opposed all injunctions is ill-disposed by such judicial means to prevent the Boomer Coal Co. from paying the $500 in question to the unrecognized District No. 30. It has been their cry that the injunction is an unmitigated evil, and it would be a humiliating confession to make use of this instrument. It is said the Boomer Coal Co. is disposed to pay the money over to District No. 30, but it is hard to see how such an action can be justified, as its contract was made with District No. 17.

Strikes in West Virginia, Kentucky and Illinois

At Hartford, Mason County, W. Va., in the Pomeroy Bend district, 40 miners went on strike at the mine of the Jackson Coal & Mining Co. A miner desired to be changed from entry to room work, and on his being refused, his fellow-workmen quit for two days. Of course, the strike was a violation of the miners' contract. To begin with, the miners had no grievance and, secondly, if they had, the question by their agreement must be settled without a strike and in the manner provided.

At Harlan, Ky., 115 miners of the Catrons Creek Coal Co. were recently on strike for three weeks. They have returned to work without having gained the recognition of the union which they desired or the reinstatement of two men, the discharge of whom occasioned the walkout.

The Mt. Olive & Stanton Coal Co. has had a controversy with the United Mine Workers of America relative to the operation of the new $50,000 washer of the company. Nonunion men were employed on the work at the washer, but the water needed for its operation has been pumped from a nearby mine where union miners and a union engineer are employed. These men demanded that union men be engaged to operate the washer. If the plant was to be operated as a nonunion proposition, the men demanded that the union engineer should not be required to pump water for the jigs. By installing a pump at the washer the difficulty was successfully overcome.

The "Loss-Sharing" System in Coal Mining

In the issue of "Coal Age" of July 10, pp. 52 and 53, mention was made of the strong feeling of opposition among Illinois union men to the coöperative movement which may be better called the "loss-sharing" rather than the "profit-sharing" system. On Aug. 17, 12 men were charged with complicity in a plot to destroy the mine and buildings of the Granger Coal Co. at Winkle, Perry County, Ill. This mine is worked on a coöperative basis.

The preliminary hearing took place before Justice Fallon at Duquoin of that county. Two were held for the grand jury and the other ten were discharged. The two men held are David Richards, white, and William Hawkins, colored. They will be tried at the November term of the Perry County Circuit Court. Hawkins gave the authorities the information which resulted in the arrests. He said he was offered $200 to aid in blowing up the mine. Richards had dynamite caps in his pockets when arrested.

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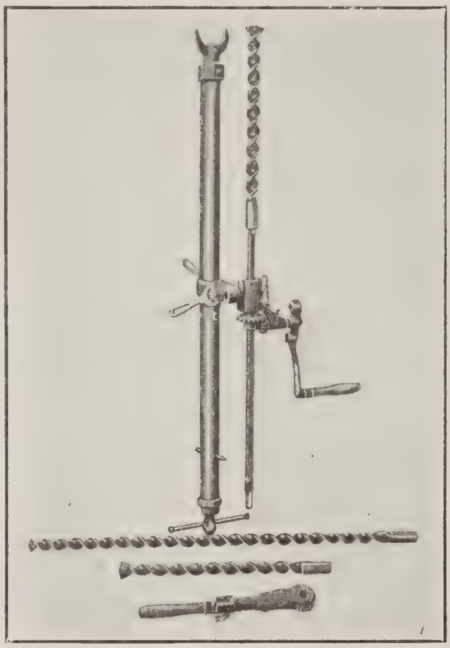
In the South Wales District and in Monmouth County, the county which adjoins South Wales but is in England, 60,345,295 short tons were produced in 1914. The whole tonnage of Great Britain was 297,520,193 short tons. So the South Wales field produced, roughly, 20.28 per cent. of the whole production of the United Kingdom. In 1913, 233,091 men worked at the mines of that district, of whom 35,003 were surface workers. Of course these figures have been seriously depleted recently by the recruiting sergeant's activites.

New Apparatus and Equipment

New Hand-Operated Post Drill

The Howells Mining Drill Co., of Plymouth, Penn., has recently placed upon the market a new post drill known as the "Spry Type C" machine. This drill is hand-operated and is designed for drilling coal and the medium hard rocks usually found in coal, fire clay and other mines.



THE POST DRILL SET UP TO DRILL VERTICALLY

The machine proper is mounted on a post light but sufficiently strong for the purpose. This post may be extended two-thirds of its normal length. Thus a 6-ft. post can be extended to 10 ft. in length. The boring head is carried on a yoke which encircles the post and may be readily clamped to it or moved from one position to another. The boring head also swivels on the yoke so that the auger or bit may be turned at any angle.

It may be thus seen that since the yoke may be turned completely around the post and the head swivels on the yoke throughout an entire revolution, the auger may be placed at any angle in either a horizontal or vertical plane or both and may be thus pointed in any direction whatsoever.

The vertical adjustment of the yoke on the post permits of holes being drilled within 5 in. of either roof or floor of a mine. The post will work with equal facility either end up. Augers are usually furnished varying in length by 2 ft., the ordinary set consisting of lengths of 2, 4 and 6 ft.

The ratio of the bevel gears transmitting motion to the drill is 1 to 2. Thus the auger makes one revolution to each two revolutions of the crank. The feed screw or bar which advances the drill may be furnished with 8, 10, 12 or 14 threads per inch so that if the operator turns the crank at the rate of 60 r.p.m. the advance of the auger would be $2^1/_7$ in. with a 14-thread bar or 3¾ in. with an 8-thread bar. For the 10- and 12-thread bars the advance would of course be 3 in. and 2½ in. respectively.

The illustration shows the drill equipped with a three-hole crank handle. An extension crank giving a variable sweep or a single- or double-acting ratchet handle may be employed. The sleeve within which the feed screw revolves is made in two pieces and may consequently be readily removed and replaced by a new one when the threads become badly worn.

This entire machine, including post, yoke, crank, set of three drills, etc., weighs only about 65 lb. It may therefore be readily transported by one man. Although it was designed primarily for drilling coal preparatory to shooting down it may also be used to advantage in many mines for taking down top or lifting bottom. It is particularly advantageous where the top rock will permit of its use in drilling peg holes for suspending trolley wire. It may be set up in about one minute and with a 10-thread feed bar would put in a 6-in. hole in 2 min. if the crank were turned at 60 r.p.m.

This drill is now in successful operation in coal mines, both anthracite and bituminous, as well as in talc, gypsum and fireclay operations.

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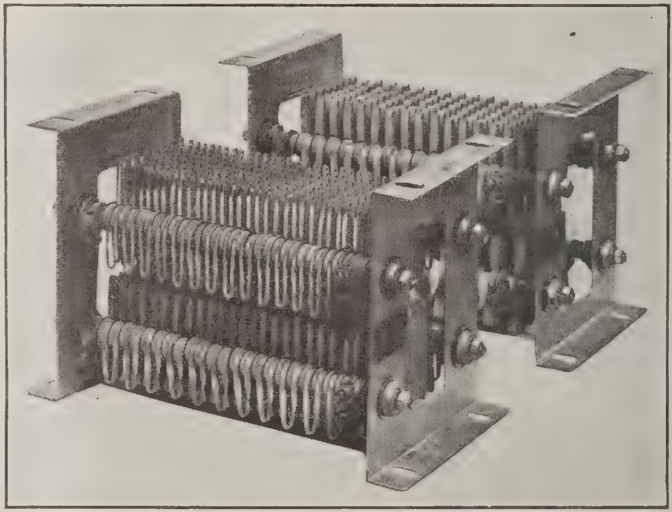
New Type of Grid Resistance

A new type of grid resistance for use in connection with direct-current motors is being placed upon the American market by the Ellcon Co., of 50 Church St., New York City. This is known as the E. M. B. unbreakable, jointless and rustproof grid resistance.



RESISTANCE FOR TWO 23-HP. 250-VOLT MINE LOCOMOTIVE MOTORS

Instead of building up a bank of grids, made of cast iron, and depending upon a tight surface contact at the bolt, to form the electrical connection between units, as is the ordinary practice with resistances of this type, the E. M. B. grid is made up of a continuous sherardized drawn steel wire. It is therefore not only extremely tough and may be subjected to severe abuse with impunity, but is rust-resisting as well.

The grids are composed of various sizes of steel wire to suit the current carrying capacity desired. At the point where the units of the ordinary cast grid come in contact, an extra loop of wire is employed. The tap or contact to the controller may consequently be easily and readily shifted or adjusted to secure proper acceleration.

The drawn wire of which the grid is composed entirely eliminates the possibility of weak or defective material entering into the construction of the grid. Heavy overloads do not seriously affect this resistance. The grids have been repeatedly subjected to a current which brought them to a white heat without warping or buckling the convolutions, which remained in as good shape as before except for the sherardizing.

The space occupied by these grids is about the same as that for the ordinary cast-iron resistance, they being assembled into sections or boxes of approximately the same dimensions, so that a change may be made from one type of resistance to the other without serious inconvenience.

This type of grid resistance is peculiarly adapted to heavy overloads or where the load is intermittent and severe, such as in steel mills, mine hoisting, traction work or mine haulage. Several mining locomotives used by various coal companies are now employing this type of grid with good results.

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The Schaffer Poidometer

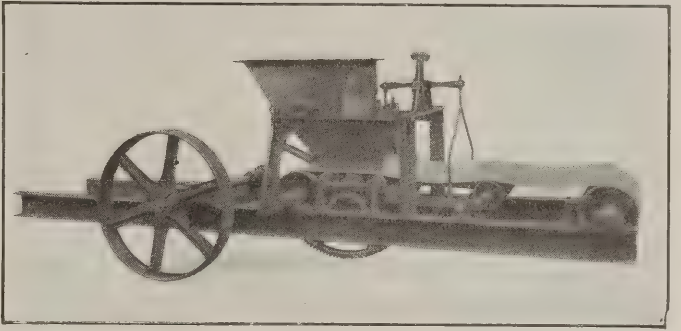
One of the most recent developments in continuous and automatic weighing machinery is the poidometer. This device is both a continuous weigher and a regulator. It is consequently of much advantage in many lines of manufacture where the machines can be arranged in batteries to automatically assemble a number of different materials in accurate proportion. These machines are thus of particular advantage at coke plants where it is necessary, in order to obtain best results, to mix several different kinds of coal.

In such a case each machine is arranged to handle a particular grade of coal at a given rate, and should any one of the machines run out of material to handle, it would not only itself stop, but stop the others.

The poidometer consists of an endless belt traveling over a head and tail pulley and supported in the center by a ball-bearing roller which is mounted on a scale beam. A system of levers attached to the scale beam operates a special gate mounted on rollers. These rollers travel on small tracks inclosed in a cast-iron housing, which is attached to the front of a special hopper, which is arranged for attachment to a bin.

The bottom of the hopper is fitted with gravity wearing shoes which are in contact with the belt. The opening in the bottom of the hopper where the shoes are attached is wider in front than it is at the back. Thus the belt in passing under it has the action of pulling the material away from the shoes and prevents it from dragging under. A subgate is placed in front of the hopper to prevent the pressure of the material coming against the regulating gate. The hopper is also provided with an agitator which prevents clogging of the machine.

The regulating gate is fitted with a double metal joint and is connected to the walking beam by pivoted points. The walking beam, the connecting-rod between the walking beam and the scale beam and the scale beam, are all mounted on knife edges, the scale beam also carrying the ball-bearing roller, which is located in the center of the distance between the last supporting roller under the hopper and the end pulley. This roller supports the belt and operates the regulating mechanism with the least possible amount of friction. The length of the scale beam and the weights employed are so proportioned that the weights will produce the number of pounds per foot of belt indicated by the figures upon them. These weights may be changed and adjusted so as to give any desired delivery within the limits of the machine. When any machine for any reason does not receive material it makes an electric contact and stops all the machines in the battery.


THE POIDOMETER

The regulating and recording device is attached to a measuring drum placed under the belt directly in front of the driving pulley. This drum measures off the exact travel of the belt and operates the counting and tabulating mechanism. It also actuates a device for automatically stopping the machines when a predetermined quantity has been delivered. The device may be set for different amounts or quantities of delivery. To facilitate assembling materials into batches, a controller is provided which will automatically stop and start the machines at intervals. Thus any predetermined number of pounds of different materials may be assembled into a batch containing the exact amount of each ingredient every time. The interval for the machines remaining stationary after the batch has been assembled can be regulated to suit the time that is desired between batches. After this time has elapsed the machines will automatically start and assemble another batch with the same number of pounds of each ingredient as before.

The machine is mounted on a steel channel frame which may be extended when necessary to suit conditions. The driving machinery is all mounted on this frame, and the speed reductions are such that the machines can be connected direct to a line shaft or motor. Where a number of machines are installed in a battery they may all be actuated from one central drive.

These machines are built in five different sizes, ranging from 14 in. to 36 in. in width, and the capacity range is from 1½ lb. per min. up to 5 tons per min. They are guaranteed to give an accuracy of 99 per cent. The poidometer is patented by J. C. Schaffer and is built by the Schaffer Engineering & Equipment Co., of Tiffin, Ohio.

Editorials

No Consignment Coal from Southern Illinois

In times past a great deal of consignment coal from southern Illinois mines was forwarded to Western distributing centers and sacrificed regardless of price. This coal was usually consigned to jobbers with instructions to effect disposition at any figure in order to obtain immediate cash for payroll requirements. Two companies guilty of this practice in past years have been obliged to shut down their operations, and the balance of the field has kept free coal absolutely off the market this season. This has been a most important factor, in the face of the dull summer demand, in maintaining prices for southern Illinois coals. The companies which indulged in the practice of shipping consignment coal are now bankrupt, because as a rule this was sold below the cost of production.

In some of these mining districts, when surplus coal is now accumulated, particularly screenings, it is dumped on the ground awaiting a favorable turn of the market for reloading and shipment against bonafide orders in hand. This maintains a much more healthy condition than was the case with the old method of shipping consignment coal to jobbers to be sold at any price.

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Egyptian State Ry.'s Contract

American shippers would find it difficult to conform in all respects to the coal "specification" sent out by the Egyptian State Railways and Telegraphs. Besides the items noted in another column, summarized from the ten quarto pages of the pamphlet issued, there are certain stipulations that sound rather drastic. The strike clause, for example, gives the right either to cancel the unfilled portion of the contract or to compel the contractor later to make good the deliveries which would otherwise be made were no strike in force. Purchases in the open market can be made for account of the contractor when in the judgment of the buyer there is failure to deliver in season.

It is also interesting to note that the buyer reserves the right not only to reject coal at the loading port and to require cargoes to be loaded in daylight, but that if the cargo is made up from more than one colliery the inspector can have the coal from each colliery sampled separately and each regarded as if it were a separate cargo. The tests, however, are to be made before shipment. Only coals like those from the Fairmont, W. Va., district would be eligible, anyway, because of the volatile requirement. On the point of ash the specification is not so exacting.

It is almost amusing to observe that while chartered bottoms are to be loaded by the Welsh contractors "with the utmost possible dispatch," they must in any event load a 5000-ton steamer within 180 hr., or nearly 8 days if 24 hr. is a working day, "time occupied in bunkering not included!" With loading at Hampton Roads at the rate of 7280 tons of cargo and 189 tons for the bunkers in 2 hr. and 45 min. there should be no difficulty in meeting this condition.

With freights at $11@12 to Mediterranean ports, the deposit required is quite excessive. And with the further provisions that settlements are to be made "check on London" when cargo is discharged, payment of freight to be arranged by the shipper, and the limit as to size of ships, it seems unlikely that American shippers will be enthusiastic about this particular business in Egypt. In future years, if additions are made to the American steamers now being built for the Mediterranean trade, it may be that conditions will be modified and that American shippers will be successful competitors for such contracts.

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Some Notes on the Western Coal Rates

The recent decision of the Interstate Commerce Commission grants advances in rates from Illinois mines to Northwestern points of 5c. to 10c. per ton. At the same time there is no provision for advances in rates on coal moving from the docks at the head of the lakes to the same points. It is thought that some of the railroads, recognizing the unfortunate results of checking in these advanced rates, may feel inclined to waive their privilege unless such advances can be made to apply on competitive coal from all other districts moving into the common Northwestern markets. It is currently reported that most of the carriers serving the mines in Franklin and Williamson Counties have informally told the operators of those districts that they will not take advantage of these increased rates, for the time being at least.

The prices received in later years for fine coal from Illinois mines bring much more revenue to the coal companies than formerly, when slack was practically without a market. The carriers have never received proper compensation for hauling any grades of coal, and the commission apparently believes that they should now be favored in a substantial way. They hold to this opinion irrespective of the competition from lake coal and the fact that the Northwestern States are the more logical market for southern Illinois coals than the Eastern product from West Virginia, Pennsylvania and Ohio moving via the docks. Inasmuch as Commissioner Daniels dissented vigorously from the decision of the other members of the commission and states in substance that the question was not decided upon its merits, it is strongly hinted in certain quarters that a rehearing of the whole case is not only possible but necessary in fairness to Western coal producers.

This is the second advance in freight rates on coal moving from Illinois mines to Northwestern points in the last three years, and most of the Illinois operators would not object to the recent increase, and think it would do no damage, if the carrying charges on dock coals were advanced proportionately. A close analysis shows that the average increase is a fraction less than 10c. per ton. The territory affected is that west from Chicago to the Rocky Mountains, except South Dakota points. As the case now rests, a large amount of business to Northwestern points will be absorbed by the docks and taken away from the Illinois and Kentucky mines. The decision is of some benefit to the Iowa producers who ship coal into outlying points of Iowa, southern Minnesota and Nebraska.

The Reduction in Anthracite Freight Rates

The recent order of the Interstate Commerce Commission directing the coal-carrying roads to reduce the rates of freight on anthracite seems to have been based by them on their finding that "anthracite coal is a low-grade commodity" compared with other classes of freight. Of course it is not likely to find all interests in agreement on this point, but inasmuch as the commission has spent three years in arriving at this conclusion, it is certainly reasonable to suppose that they have gone into the question with greater care than anyone else except the railroads, and for that reason their finding must be given its just valuation.

It is extremely difficult to forecast the probable effect of the decision, for the reason that its provisions will not likely be operative for a few years. That the order will be appealed, goes without saying. As a matter of fact, the various railroads concerned have already met to determine jointly what action they will take. There are some who will even criticize as collusion the fact that the attorneys of the various roads have dared to meet and discuss this subject among themselves. However, when it is remembered that the action for a reduction of rates was brought against the railroads jointly it will be seen that there was practically no basis for any such adverse comment.

The source of appeal on a point of law is to the United States Supreme Court and the manner of the appeal is the only question to be considered by the railroads, and it is not at all certain that the railroads will be a unit on this point. This is because the order affects some roads to a very much greater extent than others. For instance, the Delaware & Hudson and Ontario & Western R.R. declare that the proposed rates as affecting their respective companies are so drastic as to be practically confiscatory, and it is on this ground that they are likely to make their appeal.

In making its decision the Interstate Commerce Commission probably had in mind the order of the recently created Pennsylvania Public Service Commission, which a year ago ordered the railroads to make a reduction of 40c. per ton on anthracite to Philadelphia and vicinity. As is well known any order of the national commission has no effect on intrastate traffic, and the present order of the interstate body seems practically to equalize the intrastate and interstate rates. For this reason the supporters of the Pennsylvania commission point to the order of the Interstate commission as confirmation of the Pennsylvania action. The Pennsylvania decision is in abeyance at this time, having been appealed by the coal companies, but those who favor it are now satisfied that it will be upheld.

The people who are apparently most satisfied with the rate orders are the coal dealers and the individual operators. The former declare that their present profit is so small as to almost preclude the possibility of putting the retail coal business on a basis commensurate with other profitable mercantile enterprises, while the individual operators claim they will now have a fair field in competition with the railroad-controlled companies who produce approximately 80 per cent. of all the anthracite coal now being mined.

This leaves the consumer entirely out of the calculation. It is barely possible should the new rates really become effective that he will be benefited, but it is also absolutely certain if the drain on the carrying roads by reason of the new rates should be such as to financially hinder them the consumer will be the man to bear the burden—not in a feeling of revenge, but because of absolute necessity; for it is no more possible to operate a transportation line without an adequate income than it is to run the ordinary corner grocery without any return.

For the time being, so far as the consumer and retail dealer are concerned it is a waiting game; but for the others it is a time of incessant action. It is possible that pending the appeal the retail dealer may receive some rebate on all freight paid from the time the new order becomes effective. This was the course followed in the appeal from the decision of the Pennsylvania Public Service Commission. The railroads entered bond to repay the difference should the rates be decided to be in accordance with law.

This latest decision is only another proof that the transportation business of the country is in a transitory state, and it is sincerely hoped by everyone concerned that the end of the unrest is in sight and that the final adjustment will be such as to conduce to the equity and satisfaction of all concerned.

The Shake-Up in the Middle Western Freights

Anthracite shippers are uncertain as to the results which will follow the recent decision of the Interstate Commerce Commission in which an advance of 25c. in the rate to Chicago territory was approved. So far no changes have been made in prices, but some jobbers look for an early advance on the part of the wholesalers to absorb the increased freight rates.

The outcome of the recently developed bituminous rate situation is also problematical. This increase becomes effective Sept. 30. The docks will undoubtedly benefit from this decision as it now stands, but so far the Western carriers show no disposition to take advantage of the decision and advance rates, as to do so would mean a falling off in the heavy and increasing tonnage from Illinois and Kentucky mines.

The roads do not seem to know what course they are going to pursue, which has made future plans of the operators uncertain. The next six weeks should see a considerable volume of increased shipments at the lower rates now in effect. If these rates are effective beginning Oct. 1, Western operators will have a smaller selling zone, which means congestion of tonnage and lowering of prices. What readjustment will be the outgrowth of this verdict is problematical.

Sociological Department

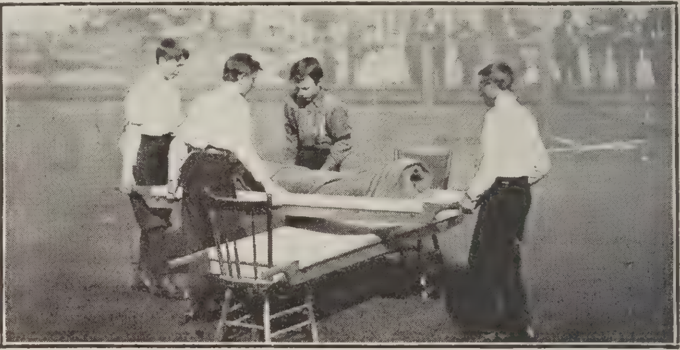
First-Aid Contest in Crowsnest District, British Columbia

By E. Jacobs*

For years instruction has been given in first aid in the coal-mining centers of British Columbia, and as a result there are at every operating coal mine many men competent to render first aid in any emergency. Last year Dudley Mitchell was appointed instructor in first aid for the Provincial Department of Mines. He has since that time aided in organizing first-aid classes, not only among metalliferous miners, but also among those working in coal mines. He has also given instruction in the use of oxygen-breathing apparatus and the pulmotor and has trained the corps in mine-rescue work generally.

FERNIE TEAM WHICH RECEIVED FIRST PRIZE

From left to right, in rear—C. McNey; J. Hamer, captain, and A. Bunch; in front—W. Whalley and R. D. Winstanley



FERNIE TEAM OF BOYS LIFTING PATIENT OVER OBSTACLE

This team won the first prize for juvenile contestants and did excellent work. Note how careful they are not to jar patient

Classes for instruction in first-aid have been organized at Corbin, Michel, Fernie and Coal Creek, in the Crowsnest district; at Merritt, in the Nicola district; and at Ladysmith, Extension, South Wellington, Nanaimo, Cumberland and Bevan, all on Vancouver Island. Between 300 and 400 persons, in all, attended these classes, and more than one-half of those who took the full course afterward passed the prescribed examination entitling them to the certificate of competency of the St. John Ambulance Association, which certificate is recognized in all parts of the British Empire.

For some time past active interest has been taken in the first-aid movement by W. R. Wilson, of Fernie, general manager for the Crow's Nest Pass Coal Co., and the superintendents and other officials of that company's many coal mines and coke-oven plants. About three months ago a first-aid contest was arranged to be held at Fernie early in July, and representatives of the Coal Creek and Michel collieries and the coke plants at Michel and Fernie met and adopted rules under which this contest should be held. Meanwhile the first-aid men practised zealously, and enthusiasm spread throughout the three camps, until when the various contests were held there was an attendance of 800 or more to witness the efforts

EXECUTIVE COMMITTEE, ST. JOHN AMBULANCE ASSOCIATION, CROW'S NEST PASS CO.

From left to right, back row—Dudley Michell, provincial government instructor in first-aid and mine-rescue work; G. O'Brien, district inspector of mines; Ed Hesketh, T. Uphill, Thomas Russell, manager Michell colliery; T. H. Williams, district inspector of mines; Bernard Caulfield, manager Coal Creek colliery; J. Biggs and J. Mason. Center row—W. Whitehouse, J. Touhey, J. Millburn, R. Spruston and Isaac Haile. Front row—C. J. Tyler, A. Bunch, J. Hamer, A. Hancock, Ed Harrison and W. Lancaster

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*P. O. Box 645, Victoria, B. C.

TEAMS OF FERNIE AND MICHEL MINERS CONTESTING AT FERNIE, B. C., IN A FIRST-AID MEET

of the competitors, and this, too, notwithstanding that the weather was rainy.

Michel sent four adult teams, and Coal Ceek three and also one of boys, while Fernie was represented by four teams of men and one of boys. As each team consisted of four competitors and a patient, there were 55 men and 10 boys taking part in the contest.

MEN'S CONTEST

The men's teams representing Michel colliery were captained respectively by A. R. Stacy, R. L. Spruston, J. Touhey and J. March; those of Fernie by J. Hamer, W. Hunter, J. Monks and J. Taylor, and those of Coal Creek by E. Harrison, J. Caulfield and R. Johnson. A first prize of $50 and a second of $25 were offered for competition by these teams. A Fernie team consisting of J. Hamer, captain, C. McNey, A. Bunch, W. Whalley, and R. D. Winstanley, patient, won the first prize.

COAL CREEK TEAM CARRY PATIENT UPSTAIRS

Notice the interest shown by the "kiddies" in the rear, showing how popular is first-aid

For the second prize the competition was so close that the judges decided that one of the Michel teams and one from Coal Creek were equal, so each was awarded $25. The members of these teams were as follows: From Michel, A. R. Stacey, captain, C. J. Tyler, W. J. Spruston, W. Touhey, and J. Horrocks, patient; from Coal Creek, E. Harrison, captain, Isaac Haile, J. Millburn, W. M. Branch, and James Young, patient. The judges for this competition were Doctors Bonnell, Burnett, Corsan and Moore.

BOYS' CONTEST

A first prize of $25 and a second of $15 were offered for competition by boys' teams. There were only two entries—one team from Fernie and one from Coal Creek. The first prize was won by the Fernie boys, who were: A. Woodhouse, captain, C. Stockwell, H. Quince, A. Rees, and T. Baker, patient. The second prize fell to the Coal Creek team, consisting of J. France, captain, A. Branch, J. Cartmell, H. Hartley, and H. Evans, patient.

After the contest, W. R. Wilson gave a dinner to all members of the first-aid classes of the St. John Ambulance Association; for the Fernie and Coal Creek men at Fernie and for the Michel men at their own home town. A concert followed the dinner at Fernie, and the day's proceedings terminated with a general resolve to make the first-aid contest an annual event.

The record of the employees who attended classes of the Crow's Nest Pass Coal Co. and passed the examinations in first-aid conducted by the St. John Ambulance Association is as follows:

	First Year (Certificate)	Second Year (Voucher)	Third Year (Medallion)	Fourth Year (Label)	Total Qualified
Michel..........	13	6	1	3	23
Fernie..........	59	2	1	1	63
Coal Creek......	42	7	1	3	53
Total........	114	15	3	7	139

Taking the total number of employees at approximately 2000, it will be seen that the result of this year's instruction is that there is among the company's workmen one man trained to render first-aid for every 14.3 men employed.

Workmen's Compensation and Coal Mining

A new method has been adopted by a group of well-known casualty-insurance companies for inspecting and rating the relative value of each hazard which goes to make up the total accident risk in a coal mine. Perfection of the method adopted has necessitated the establishment of standards for each separate safety measure which may be adopted in coal-mine operation. Every risk within the mine which is less imminent than the standard will earn a reduction in the base premium rate adopted for the state, and those operations in which the risks are more threatening than the standard will be required to pay a higher annual premium for the insurance of their workmen.

MAKING SAFETY PROFITABLE TO THE OPERATOR

In other words, coal-mine operators who are endeavoring to appraise their respective liabilities under workmen's compensation may change their unknown obligations in this regard into fixed known liabilities by insuring themselves against their risks. They will be given by the agencies of insuring companies a base rate. A careful and scientific inspection will then be immediately made of the mine by an experienced mine inspector, and he will rate each element of risk in the mine as being above or below the standard adopted. There will result therefrom a merit or schedule rating which may materially reduce the amount of premium that the mine owner will have to pay for insurance under workmen's compensation, or it may increase it, thereby offering the owner in the form of a premium reduction a monetary incentive to make his mine more safe.

It is evident that here is a new and benign influence in the mining industry which will increase safety in mining and make corporations realize that the price of safety must be expended whether in payment for insurance or in outlay for safety. This will make all companies face the question squarely and prevent operators who do not have a due sense of their duty from underbidding those who expend large sums to keep their mines in safe condition.

Department of Inspection and Safety Formed

As an evidence of good faith to the mining industry and to such mine owners as may insure with the associated companies, the latter have organized as their medium of doing business a department of inspection and safety, and as an evidence that this department is to be conducted on thoroughly scientific and practical lines and so far as possible in the interests of and in full coöperation with all elements of the mining industry, they have secured as director of the department the services of Herbert M. Wilson, formerly engineer in charge of the Pittsburgh experiment station, United States Bureau of Mines.

Mr. Wilson's long association with the late Dr. Joseph A. Holmes, director of the Federal bureau, his well-known interest in safety in mining, the coöperative spirit which he has heretofore shown in dealing with mine operators, mine workers and state inspectors, and his wide personal acquaintance with men interested in the mining industry assure the adoption of a system of mine inspection which should be of great assistance to the mine owner as an auxiliary to his own inspection and safety measures, as well as one which should develop the most reasonable premium rates commensurate with safe business practices.

This association proposes not only to inspect the mines of the insured for the purpose of fixing rates, but it proposes to reinspect these mines periodically for its own protection and that of the mine owner and so that it may give reduction in premium rates whenever they are earned by the operator's adoption of safer methods. Of equal importance to the insured mine owner is the assurance that the department of inspection and safety will advise him as to methods in which dangerous conditions may be eliminated.

Improvements Made Out of Insurance Savings

Under such a system practically and technically applied the mine owner will be enabled to earn such reductions in the premium rates that the cost of his improvements to assure safety will be returned to him within a year or two by reductions earned in his premiums. Some of the safety methods adopted by corporations, such as additional inspection, are believed to have resulted not merely in reducing accidents, but in improving the product and even in lowering its cost. So some, at least, of the expenditures for accident prevention and part of the cost of insurance will be offset by the economic advantages gained by the precautions taken.

As an evidence of the financial strength behind this movement and its resources for carrying out its work it is only necessary to recite the names of the ten powerful casualty-insurance corporations forming the "Associated Companies" which have pooled their interests for insuring coal mines in compensation states, namely: The Aetna Accident & Liability Co.; Aetna Life Insurance Co.; the Employers' Liability Assurance Corporation, Ltd., of London, Eng.; Hartford Accident & Indemnity Co.; London Guarantee & Accident Co., Ltd., of London, Eng.; Maryland Casualty Co.; the Ocean Accident & Guarantee Corporation, Ltd., of London, Eng.; the Standard Accident Insurance Co., of Detroit, Mich.; the Travelers' Indemnity Co., and the Travelers Insurance Co.

The above plans will be carried out only in those states which have enacted compensation legislation applying to coal mines and where the terms of legislation or regulations will permit stock insurance companies to do business, namely: Colorado, Illinois, Indiana, Iowa, Kansas, Maryland, Michigan, Montana and Pennsylvania.

The methods adopted by this association will not only follow closely the requirements of the best state mine-inspection laws, but also those safe practices which have been developed in the Bureau of Mines. It was with this object in view and in order that this work might be kept in close touch with the mining industry as well as with the Bureau of Mines that Mr. Wilson has fixed his office in Pittsburgh, Penn.

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American Mine Safety Association

The impression seems to have been conveyed by articles appearing in the technical journals that the American Mine Safety Association has ceased to exist. President A. F. Knoefel and Secretary H. M. Wilson give the assurance that this is by no means the case, but that it is not only very much alive, but will be more active than in the past, though under another name.

The recent ballot concerning the amalgamation with the National Safety Council was almost unanimously in favor of such action, and it is said that the executive committee of the latter also favors taking over the American Mine Safety Association as the mining branch. The effect will be to practically centralize all safety movements within the National Safety Council.

The American Mine Safety Association will hold its annual meeting as contemplated in Birmingham, Ala., Sept. 3, and it is expected that it will take a recess to reconvene Oct. 20 at the annual meeting of the National Safety Council, in the Bellevue-Stratford Hotel, Philadelphia, as the mining section thereof. At that time there will probably be elected officers and committees of the mining section for the purpose of carrying on the activities of the American Mine Safety Association along lines identical with those heretofore followed.

In addition the members will receive the weekly safety bulletins of the National Safety Council and its correspondence service on safety subjects, and there will be a decided strengthening of the local branches through the opportunity to include in their activities not only safety in mining, but also in railways, manufacturing industries, public service, etc. Any mine-safety organization should be thus broadened, because the metal-mining industry desires an organization covering mills, smelters and railroads as well as mines.

We are further advised that persons taking out memberships in the American Mine Safety Association prior to the consummation of the proposed consolidation in October will have the privileges of membership in the larger organization for the ensuing year, but at the lesser rate of membership dues called for by the American Mine Safety Association.

Discussion by Readers

The Dr. Holmes Memorial

Letter No. 1—Referring to the editorial in *Coal Age,* July 31, p. 177, entitled "A Memorial for Dr. Holmes," I beg to say that I am heartily in accord with such a movement and believe something of the sort should be done.

Of the two ideas mentioned in your editorial, my preference would be for the book rather than the monument. The monument would be seen by comparatively few, especially of mining men who would be most interested. The book, on the other hand, would be available to every mining man sufficiently interested to want to possess one. The book would give the readers thereof an insight into the life, work, character and personality of Dr. Holmes, which many will be anxious to get and which would otherwise be unavailable. The book, I believe, would be an inspiration to all who read it. I vote for the book.

EDWARD H. COXE.

Knoxville, Tenn.

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Labor in Mining

Letter No. 8—I read with much interest the able support of the United Mine Workers of America by Hugh Archbald, *Coal Age,* July 24, p. 124; but was surprised to find an efficiency engineer advocating a cause whose principles are the antithesis of efficiency in coal mining.

Direct contact with pit committees and the discussion of matters relating to this organization both with miners and operators, together with the reading of the United Mine Workers' *Journal,* technical magazines and comments of the general press, have fully convinced me that the recognition of the union as it is now managed is wrong in principle and against the interests of the operator and general public policy. My conclusions are based on the following four counts:

1. The organization, under its present management, assumes to usurp the functions of ownership of the mine and infringes on the rights of the individual miner.
2. Its tendency is to destroy the discipline of the mine and to hinder the enforcement of the rules and regulations designed to safeguard the work of mining.
3. The methods adopted by the officers of the union to secure their ends tend to foster discord among mine workers, the majority of whom are coerced to act in opposition to their better judgment.
4. The direct result of the application of these principles is a decrease in efficiency in the operation of the mines.

Referring to these counts, singly and in detail, the organization usurps ownership of the mine by depriving the owner or his agents of the right to hire and discharge their employees at will. Mines have been shut down by order of the union because a slate-picker was employed who was not approved by some influential members of the union. In another instance an entire division of the company's mines was closed down because the demand of the union for the discharge of the district superintendent was refused. The superintendent in question was a man of the highest technical ability and character. Other mines have been shut down for the discharge of members of the union for the willful violation of mining rules and regulations.

The organization infringes on individual rights by forbidding superintendents and foremen to make any agreements with a miner in their employ that is not sanctioned by the scale. For example, at a mine in the West under my charge the scale was $3.10 for an 8-hr. day. It so happened that the boarding boss—a man who had never been in a mine—was promised a job when a vacancy occurred that he could fill, and as a result was employed a little later as a car-greaser. His pay was $3.10 a day, according to the scale. Shortly after, the inside mechanic said to me: "It looks mighty hard for a man who has worked in a mine since he was eight years old to draw the same pay as that old plug who never saw the inside of a mine till yesterday." I replied: "Nick, what you say is true. The car-greaser's job is worth but $2 a day, and the man would be glad to take it at that, while your work is worth more than the scale paid. If I was free to do as I pleased, I should pay you $4 a day and the old man $2 a day, and everybody would be satisfied; but your committee says, 'Pay every man the scale, whether he is worth it or not.' "

Where the scale exceeds a minimum wage, the company must in self-defense make that the maximum wage; and as a result I have seen every man make a maximum day's loading. I remember a large mine where the turn was limited to four cars to each miner. When he had loaded that number, he could load no more. Mr. Archbald discussed this point in a previous article, *Coal Age,* July 10, p. 48. Absolute impartiality in all dealings with employees is a prime qualification of a mine foreman or superintendent, and plain justice demands that each and every miner be given an equal opportunity to load coal and that the scale should discriminate between the mining of pillar coal and the driving of rooms and entries.

In the fixing of a scale, regard must be had to the interests of the operator as well as those of the miner. The efficient operation of the mine requires that every miner be allowed to put out as much coal as he can load, the turn of cars being distributed so that each man is encouraged to make his time, skill and strength tell to the best advantage. The principle of equality of pay at a given mine can be applied only by holding back the steady, industrious and skilled workman so that he does not rise above the level of the one less steady and skillful. It would be a hard proposition to raise the latter person to the level of the former. The miners' organization does not attempt to do that.

In respect to the work of the organization destroying the discipline in a mine, it is only necessary to consider how the authority of the foreman or superintendent is curtailed by the fear of precipitating a strike by the discharge of an employee for suitable cause. Any abridgment of the power to discharge an employee seriously impairs discipline in any industry. By their opposition to many rules and practices designed to safeguard the work of mining or to the discharge of men for violation of rules, the organization has handicapped mine discipline. Such opposition has frequently rendered a good rule inoperative. According to statements in the press, the fines of members convicted of violating rules have in some cases been paid by the organization. Mines have been closed down because shotfirers did not fire shots that in their judgment were unsafe. The opposition by the organization to the use of permissible explosives is too well known to require more than passing mention.

In deciding the value of the organization to the miner, the question may well be asked, What has it done to advance his standard or to lift him to a higher level? The union displays no pride in the attainments of its members and makes no endeavor to raise the standard of vocational excellence. It does not attempt to increase the miner's earning power by increasing his knowledge and efficiency as a workman. It makes no effort to purge its rolls of the inefficient or vicious. Its membership card is no guarantee of the ability of the holder to perform work in the mine. Instead of striving for these attainments, its whole endeavor is simply to increase its membership, so as to enforce its demands by virtue of its numbers and not by merit.

Compare these conditions with the work that has been done during the past 20 years to raise the standard of technical excellence and personal integrity among mine superintendents, foremen and other mine officials. This work is still being pushed, and each year the standard is raised to a higher degree of excellence. Has the advancement of the miner during the same period kept pace with that of mine officials?

In considering further the right of the organization's claim to support, it is unnecessary to remark that no corporation can preserve its administrative power and divide its authority with another organization or committee. As a matter of public policy, any organization assuming to control industrial affairs to the extent that the United Mine Workers have attempted should be incorporated under the laws of the land, so that its acts may be subject to review by Federal boards and commissions, in the same manner as the railroads and other public utilities are controlled. All thinking men realize that the day of absolutism is fast passing, and the time is not far distant when labor unions will not be exempt as now from the application of trust laws. When labor unions become corporate institutions and claim no privileges not extended equally to organizations of capital; when they set up higher standards of vocational excellence and truer ideals of citizenship; when a union card bears some evidence of the fitness of its possessor; when union contracts are kept inviolate—then and only then will these organizations command the respect and support of the public and receive recognition by corporations.

Since leaving college, my life has been spent in mining camps, where I expect to stay. I have shared the bucket and bunk of the miner and know that many of the world's uncrowned heroes are to be found in his ranks. I am interested in the vocational excellence and skill of the miner as a fellow-workman and in fullest sympathy with every movement to increase his safety and comfort in the mine and improve his living conditions. I desire his uplift, both as an individual and as a class, but no plans to this end will succeed unless the man himself is reached and taught his individual responsibility and the value of his personal work and efficiency to the general community in which he lives.

S. A. Driver.

Augustin, Ala.

Prohibition and Welfare Work

Letter No. 3—In reading the article entitled "Prohibition from a Miner's Viewpoint," *Coal Age*, July 17, p. 80, one is surprised at the question of its author. He asks, "Are we doing right by these miners?" At times I have been inclined to think that there is a certain amount of coddling indulgence permitted in our welfare work among the foreign-speaking miners.

The writer of the article to which I have referred has well suggested that "if you would put an end to a habit of any kind in men, women, or children, you must give them something in place of it." Among the foreign element in our mines the men worthy of uplift efforts in their behalf will suffer no hardships by reason of the prohibition movement that is so steadily gaining ground in many mining districts.

The thoughts and interests of this class of miners when they are deprived of their booze will seek another channel. The man who is worth while will not long regard as a loss what he knows never did him any good. He will be quick to embrace other diversions now offered in so many mining towns as a result of the earnest efforts of the Y.M.C.A. These diversions consist chiefly of reading rooms and classes, with the added attractions of bowling, billiards, ball and tennis grounds, swimming pools, etc., whereby he is enabled to pass his idle hours in a pleasant and and profitable manner. The associations thus afforded bring him in contact with forces that will educate and lift him to a higher level.

I do not mean to say that this will be the result in every individual case; but while some drift away, like "Steve" and "Martin," whose letters written from West Virginia to the Ohio superintendent have been quoted, men who are worth while will stick to their jobs and attract to the mine a better class of workers. It must be remembered that a smaller number of orderly, industrious, steady-working, sober men will prove more efficient and produce better results than a larger number of noisy, carousing men who are idle much of the time, and are sullen workers at the best.

It is rightly conceded by the author of the article that "West Virginia coal-mine operators have done much for the uplift and social betterment of the mine worker"; but, as he states, "much remains yet to be done." That the coal-mine operators of West Virginia consider statewide prohibition as the greatest stride yet made in welfare work is evidenced by the active interest they showed previous to the election that resulted in a dry vote being passed. And since the passage of this law they have made every effort to encourage the enforcement of the dry laws in their own communities.

Following up, as they have, this master stroke of state prohibition with the steady development of many uplifting agencies, such as first-aid teams, athletic teams, prize gardens, night schools, etc., instituted by individual companies, the West Virginia coal operators are not likely to experience much difficulty in obtaining a higher and more permanent class of labor. In closing, I desire to quote a paragraph from a recent issue of the *Journal* of the American Medical Association, which states clearly the average coal operator's conception of general welfare work. It is as follows:

> Human life is gradually becoming recognized as a business asset. This is a new fact in the development of the race. Life insurance companies are realizing that they can increase their dividends faster by cutting down the death rate than by increasing sales or by reducing expenses. Employers of large numbers of human machines are realizing the surprising fact that as a cold business proposition it pays—not in sentiment but in dollars—to take good care of their employees. Business men are learning that well-fed, well-clothed, contented men and women, working in well-lighted, well-ventilated quarters and on schedules arranged in accordance with our modern knowledge of psychology and physiology, actually turn out more work and better work than underpaid, discontented help, working under unhealthful and uncomfortable conditions. Therefore large corporations are spending money liberally in playgrounds, restrooms, libraries, gymnasiums, sanitary lunchrooms, moving-picture shows, safety devices, ventilating systems and similar devices for the well-being and enjoyment of their employees.
>
> If one asks these men why they are doing these things, they will disclaim any charitable or philanthropic motives. "This isn't charity," says one firm; "we want that clearly understood. This is simply good business management and common-sense. A well man is worth more to us than a sick man. A happy, contented woman turns out more work and better work than an unhappy one. Therefore, anything we can do to make the people who do our work feel at ease in mind and body we regard as good business management, just as we regard fire insurance, improved machinery and labor-saving devices." The firms that have realized the enormous importance of this discovery are already reaping the benefits. The conservation of the health of employees will be a fundamental principle of good business management in the future.

The foregoing citation from an outside source shows the appreciation of others for the efforts of the operators in the state.

F. S. Johnson.

Coalton, W. Va.

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Mining Laws and Legislation

Letter No. 9—Referring to the controversy between Thomas Hogarth, Letter No. 4, *Coal Age,* June 5, p. 988, and I. C. Parfitt, Letter No. 6, July 31, p. 183, as to the relative responsibility of the mine foreman and his assistants, I agree heartily with Mr. Parfitt that the mine foreman is and should be responsible for the acts of his assistants. I believe this to be true whether the assistant in performing any specific act is doing so as a result of specific instructions or otherwise.

Speaking of the foreman, Mr. Hogarth says, "He can be held responsible only for the orders he issues and for the employment of those he believes to be competent men to act as his assistants." I would take strong exception to this statement; first, because I believe the foreman should be responsible not only for the orders he issues, but also for the carrying out and enforcement of those orders to the extent if necessary of removing an assistant who fails to do so; and second, because one of the requisite qualifications of a good foreman is that he shall be a good judge of human nature, and if in the employment of an assistant whom he believes to be competent he errs in his judgment of the man, he and no one else should be held responsible for his error of judgment.

Every one around a mine has certain responsibilities, and every employee in a measure shares the responsibility of his immediate superior, but in my humble opinion the ultimate responsibility for the safety of the men and the enforcement of the law rests wth the foreman, who is or should be responsible for every act of every man he appoints to a position of trust or authority, whether or not such acts are the result of specific instructions. In like manner the superintendent is responsible for the acts of the mine foreman he appoints, except in matters for which the law holds the foreman responsible—a responsibility he cannot escape.

Edward H. Coxe.

Knoxville, Tenn.

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Education in Mining

Letter No. 2—I have noticed many references to the need of the education and training of miners, but it seems to me that there is not sufficient attention given to the working out of a practical scheme. Since the letter of A. M. Iner, *Coal Age,* June 26, p. 1112, I have seen no practical method suggested for interesting the great mass of miners in the matter of their own education and training, by means of which they could do better work and increase the safety of mining. Some good suggestions have been made in discussing welfare work—and recently the question was raised as to whether the coal companies, which are spending large amounts in this direction, are receiving adequate returns for their efforts.

In discussing the question of education, various reasons are generally given for its necessity, such as the reduction of mine accidents, the securing of more efficient workmen, more regular work, increased output of coal and greater harmony of operators and employees resulting in the avoidance of strikes and lockouts.

One point that has not been mentioned, however, seems to me an important one. I have observed that the educated miner will generally do quite willingly what he is told and will do it promptly like a trained solder or seaman whose duty it is to obey orders. In the same way, a good citizen, a member of the community, must obey the laws and bear his share of the common burdens. On the other hand, I have observed that the uneducated and untrained miner fails to realize his personal responsibility as one of the mine workers, and if he does at all what he is asked or told to do, it is because of compulsion.

Ask an educated miner to stop loading a car and set some timber where it is needed to support the roof, and the chances are nine out of ten that he will do so at once, and you can pass on to the next place without feeling that you must return to see that your orders are obeyed. But the uneducated and untrained man, when ordered to set timber in his place, will tell you he does not have to, or if he promises to set the post, he will delay doing so, making it necessary for the foreman to watch him and stay around until the work is done.

The educated miner is a successful and independent worker, relying on his own ability as a miner. The untrained man is prone to regard himself as one of an organization of workers whose welfare will be protected by union contracts, which are his main reliance. Reference has been made to the fact that many coal miners are prone to regard every effort of the company that is put forth in their behalf as an attempt to further their own ends by securing more work from the miner. They are unwilling, for the most part, to think that these efforts are unselfish and intended for their good. The large majority refuse to attend the night schools that are established and supported by many coal companies, explaining their indifference by many reasons.

The endeavor to improve mining conditions through the channels of education and training of mine workers meets with more success among the children. For this reason, our greatest efforts should be made in their behalf. Even here, objection is frequently made by the parents that they need the help of their children to support the family and that their small earnings will not permit them to send the children to school. In a few cases the claim has been made that the miner wants nothing free, but is able to pay for all he gets and will not send his children to a free school. But observe that if a charge was made for tuition at a school supported by the company, it would be styled by the same men as "robbery." So the work among children is not an easy proposition, and yet it is more hopeful than that among the older classes.

In this connection I want to suggest that there might be a system of education undertaken by the state, independent of the coal companies, which are always regarded as working from an interested standpoint. In the agricultural field the Government undertakes the education and training of farmers, generally, by sending men out through the country to demonstrate the best methods of growing grain and other products and of preserving the qualities of the soil by the rotation of crops. Why should not the coal-mining industry be entitled to similar benefits designed to educate and train mine workers. The coal-mining industry is entitled to its share of benefit at the hand of the Government as well as the agricultural interests of the country. In making this suggestion I do not want to be understood as not appreciating the efforts made by individual coal companies. I simply want to suggest what might prove a more effective method of dealing with the indifference shown by mine workers to their own education and that of their children.

Speaking of the education of children, if they could be instructed in the science and principles of technical mining, up to the age of 16 years, we might confidently expect that they would enter the mines as efficient and safe workers, and the need of night schools for older men would disappear in a few years. It would be a grand thing if young men could enter the mines as trained workers and know how to lay a shot, handle a safety lamp, understand its construction, know the use of the barometer and other instruments, and understand how to put up sights in a mine or figure out a problem in ventilation. Let our efforts be put forth to work out this problem in a successful way.

OSTEL BULLOCK.

Cleaton, Ky.

Study Course in Coal Mining

BY J. T. BEARD

The Coal Age Pocket Book

Relation of Drop in Temperature to Altitude—Approximately, the fall in temperature (t), in the atmosphere, varies as the 1.4 root of the height (h) above the sea level; thus,

$$\frac{t_2}{t_1} = \sqrt[1.4]{\frac{h_2}{h_1}}$$

Applying this principle and assuming a temperature drop of 6 deg. at an altitude of 1000 ft. above sea level, the mean average temperature (t), for any altitude (h), expressed in thousands of feet, can be calculated approximately thus:

$$t = 60 - 6\sqrt[1.4]{h} + \frac{2}{(h-2)^2}$$

This formula assumes a normal sea-level temperature of 60 deg. F., which is the first term in the second member of the equation. The second term of this member accounts for the fall of temperature corresponding to the increase of altitude; while the third term expresses the effect of the radiation of heat from the earth, which varies inversely as the square of the altitude factor h—2, probably owing to the influence of clouds or vapor in the lower atmosphere.

Example—Let it be required to find the temperature, at an elevation of 8000 ft. above sea level, corresponding to a normal temperature of 60 deg. at sea level.

Solution—In this case, the altitude expressed in thousands of feet is h = 8; which substituted in the formula gives:

$$t = 60 - 6\sqrt[1.4]{8} + \frac{2}{(8-2)^2} = 33.5 \textit{ deg. F.}$$

The mean observed temperature for this altitude as given in the table is 32 deg. F.

Average Temperature of Air Column—The average temperature of the air column extending from sea level to any altitude h expressed in thousands of feet, can be calculated with close approximation by the formula

$$\textit{Average temp.} = 60 - 3\sqrt[1.28]{h}$$

The mean average air-column temperature, as calculated by this formula, can be used to find the corresponding normal atmospheric pressure by substituting its value in the formula

$$p_h = 14.696\left(1 - \frac{1}{53.28\,T}\right)^h$$

The use of this formula will require a table of seven-place logarithms or more. In the solution of the following example, a ten-place logarithmic table was employed.

Example—Find the mean average air-column temperature corresponding to a sea-level temperature of 60 deg. F., for an elevation of 12,000 ft. above the sea.

Solution—In this case, h = 12, which gives for the mean average air-column temperature

$$\textit{Average temp.} = 60 - 3\sqrt[1.28]{12} = 39 \textit{ deg. F.}$$

The absolute temperature is 460 + 39 = 499 deg. F., abs.

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Example—Calculate the normal atmospheric pressure for an altitude of 12,000 ft., using the mean average air-column temperature found in the last example, T = 499 deg. F., abs.

Solution—Substituting the given values in the formula gives for the normal atmospheric pressure at this altitude,

$$p_{12,000} = 14,696\left(1 - \frac{1}{53.28 \times 499}\right)^{12,000} = 9.359 \textit{ lb. per sq.in.}$$

The Differential Method—The pressure of the atmosphere, per unit area, at any altitude x is due to the weight of air column above such point of observation. Air being compressible, any increment of pressure (δp_x), causes a corresponding minus increment of height (—δx); and, calling the unit weight of air w_x at the altitude x, we have

$$\delta p_x = -w_x\,\delta x \qquad (1)$$

But the unit weight of air varies with the pressure it supports. Hence, calling this unit weight and pressure at sea level w_0 and p_0, respectively, and that at any altitude x, w_x and p_x, we have

$$\frac{w_x}{w_0} = \frac{p_x}{p_0}\text{; and } w_x = \frac{w_0}{p_0}\,p_x \qquad (2)$$

Substituting this value in equation 1 and dividing both members of the equation by p_x, gives

$$\frac{\delta p_x}{p_x} = -\frac{w_0}{p_0}\,\delta x \qquad (3)$$

But, the differential of a quaitity divided by the quantity is equal to the differential of its Naperian logarithm.

Hence,
$$\delta \log p_x = -\frac{w_0}{p_0}\,\delta x\text{; or } \delta x = -\frac{p_0}{w_0}\,\delta \log p_x \qquad (4)$$

Then integrating between the limits x = 0, and x = h, remembering that when x = 0, $p_x = p_0$; and when x = h, $p_x = p_h$, and subtracting the lower integral from the higher,

$$h - 0 = \frac{p_0}{w_0}(\log p_0 - \log p_h) \qquad (5)$$

But the unit weight of dry air at sea level, normal atmospheric pressure (lb. per sq.ft.), is

$$w_0 = \frac{p_0}{53.28\,T}\text{; and } \frac{p_0}{w_0} = 53.28\,T \qquad (6)$$

which, substituted in equation 5, gives for the altitude corresponding to any pressure, under normal conditons,

$$h = 53.28\,T(\log p_0 - \log p_h) \qquad (7)$$

Or, expressed in comon logarithms,

$$h = 122.68\,T(\log p_0 - \log p_h) \qquad (8)$$

For normal atmospheric pressure, at sea level, p_0 = 14.696 lb. per sq.in., and log 14.696 = 1.1672; hence

$$h = 122.68\,T(1.1672 - \log p_h) \qquad (9)$$

Or,
$$\log p_h = 1.1672 - \frac{h}{122.68\,T} \qquad (10)$$

Inquiries of General Interest

Standards in Analyzing Coal

Is there a recognized system of analyzing coal, and if so, where can a copy or outline of such method be obtained? In an analysis of coal, do the percentages of the different constituents refer to the weight of each constituent in the coal? What is meant by the heating value of the coal?

R. T. M.

Terre Haute, Ind.

It is generally conceded that the United States Government has worked out a system of analyzing coal that may be properly called a "standard of coal analysis." This system is described by F. M. Stanton and A. C. Fieldner, in Technical Paper 8, Bureau of Mines, entitled "Methods of Analyzing Coal and Coke." Poole's "Calorific Value of Fuels" may also be considered a standard work on this subject. Stillman's "Engineering Chemistry" and Olsen's "Quantitative Chemical Analysis" each give good workable methods for the analysis of coal.

To use any of these outlines, however, one must possess a good knowledge of chemistry. For this reason, I submit the following clear, concise method of analyzing coal, which will prove valuable to those not having a full knowledge of chemistry. In preparing this outline I have omitted all unimportant matters.

PRACTICAL SCHEME OF COAL ANALYSIS

Reduce the sample of coal to be analyzed to a fine powder that will pass through a 60-mesh screen.

Moisture—A gram of the powdered coal is weighed in a platinum dish and placed in a hot-air oven for 1 hr., at 105 deg. C.; then weighed again. The difference is the loss of moisture, and this weight is calculated to percentage.

Volatile Matter—A gram of powdered coal is weighed in a platinum crucible and heated under a bunsen burner, under standard conditions, for seven minutes and weighed again. The difference of loss is the volatile matter plus the moisture; subtract the moisture first found above, and the result is the volatile matter, which is calculated to percentage.

Ash—The gram of coal used for the moisture determination is placed over a bunsen burner and burned down to ash or constant weight. Subtract the weight of the empty dish from this weight and the result is the weight of the ash, which is calculated to percentage.

Fixed Carbon—Add the percentages of moisture, volatile matter and ash and subtract their sum from 100 per cent. The result is the percentage of fixed carbon.

Sulphur—Mix 1 gram of powdered coal with 2 grams of "Eschka mixture," consisting of two parts of magnesium oxide (MgO) and one part anhydrous sodium carbonate (Na_2CO_3), in a large platinum crucible. Cover this mixture with a layer of the Eschka mixture and heat slowly over an alcohol flame for 30 min. Then stir the mixture gently with a glass rod and heat to redness until all the black particles are burned away. Allow the crucible to cool and when thoroughly cold dissolve out the sulphates in hot water and filter the solution. Now precipitate the sulphur as barium sulphate ($BaSO_4$), by adding barium chloride to this solution. Wash the precipitate thoroughly and weigh. Then calculate the weight of sulphur as 0.137 of the barium sulphate precipitate and reduce this result to percentage of the gram of coal taken.

Heat Value (B.t.u.)—This is the only determination not reported as percentage. This value is found by means of a calorimeter, of which perhaps the best standard type is the Atwater-Mahler bomb calorimeter. A British thermal unit is not percentage; but is the amount of heat necessary to raise 1 lb. of water 1 deg. F., at its point of maximum density.

The foregoing determinations will be more easily understood by the lay mind, and though not scientific in some details, they are yet sufficiently accurate for all commercial purposes.

All commercial analyses of coal, except the determination of its heat value, are based on the weight of the sample analyzed, and the weight of each constituent found is calculated as a percentage of the original weight of the sample.

The heat value, or the calorific value, of coal is given in heat units, per unit weight of the coal. For example, a pound of coal having a heating value of 14,000 B.t.u. contains sufficient heat to raise 14,000 lb. of water 1 deg. F. or 140 lb. of water 100 deg. F., assuming there is no loss of heat in the operation.

⁂

The Coefficient of Friction of Treated Belts

Can you give any data showing the effect of treating belts with "Cling-surface" to increase the friction?

ENGINEER.

Cleveland, Ohio.

In answer to this inquiry N. G. Near writes as follows:

In connection with Robert Thurston Kent's recent tests on belts, where he used a belt treatment on one belt and none on the other, I have made computations for the coefficient of friction under both conditions from the old belt formula

$$Log\,\frac{T_2}{T_1} = \pm 0.4343\,\mu a$$

where μ = the coefficient of friction; a = arc of contact; T_2 = tension on tight side; T_1 = tension on slack side.

Tests were made with arcs of contact of 125°, 135°, 153° and 180°.

Without treatment the average coefficient of friction is $\mu = 0.127$. With treatment the average value is $\mu = 0.163$.

The tests were static in nature. Power was not transmitted at the time of the test.

Examination Questions

Suggested Questions Relating to Breathing Apparatus

Ques.—What is the object of the breathing apparatus?

Ans.—It is designed to supply the wearer with a perfectly respirable air entirely independent of any communication with the outer atmosphere, for a period of two hours, thus enabling the wearer to penetrate (using due precaution) an atmosphere that is dangerous to life and will not support combustion, such as results from explosions or fires in mines.

Ques.—Name the principal features of the apparatus.

Ans.—1. The method of supplying the wearer with sufficient oxygen from a steel cylinder containing 10 cu.ft. of pure oxygen at a pressure of 120 atmospheres, or nearly 2000 lb. per sq.in., through a reducing valve, which reduces the pressure to normal breathing pressure and regulates the supply of oxygen to 2 liters or 122 cu.in. per min., which is the quantity necessary when performing strenuous work.

2. The method of absorbing the impurities, carbon dioxide and moisture, given off or exhaled from the lungs, is by the use of caustic potash or caustic soda, which takes up the carbon dioxide and moisture. The nitrogen of the air, being set free, circulates with the oxygen supplied from the cylinder at 2 liters per minute and thus furnishes the volume of fresh air that is necessary for free breathing.

Ques.—How would you prove that the apparatus is in a safe working condition?

Ans.—First, I would observe the gage or meter to see that the proper supply of oxygen was contained in the oxygen cylinder and fix the cylinder in the proper place on the apparatus, and prove by water gage or meter that 2 liters per min. of oxygen are being delivered.

Second, if the Draeger or Westfalia apparatus is used, I would remove the seals from the connections of potash cartridges and shake each cartridge to see that it is loose and rattling freely, when I would consider it in good working condition. This is the only test left for regenerator to the wearer, and is uncertain. If Proto or Fleuss apparatus is used I would examine the breathing bag to see that it is clean and that the inhalation and exhalation passages are free from obstruction and clean and the breathing tubes air-tight; also, that the proper amount of caustic soda (4 lb.) is placed properly in the bag, two pounds on each side. Then adjust all attachments together firmly, making the joints secure and air-tight. Now, apply the oxygen supply tube to the meter or water gage to determine that the proper supply of oxygen, 2 liters per min., is being delivered to the wearer. Being satisfied, put on the apparatus, inflate the breathing bag from the outside atmosphere, turn on the oxygen supply and go into a smoke-laden chamber for a short period of time and again determine that there are no leaks and that breathing is normal before entering a mine.

Ques.—What quantity of air must the apparatus be capable of supplying per minute?

Ans.—This is an indeterminate quantity, as the amount of air necessary depends on the amount of work being done, which is a vital point that the student should thoroughly understand. Haldane, in his tests, says, "In heavier work, such as ascending an incline or running, the oxygen consumed may amount to 3 liters per min. (183 cu.in.) while the volume of air breathed runs up to over 100 liters per min. (6102 cu.in.)." For ordinary work, 50 liters, or 3051 cu.in., of pure air per minute will suffice, while wearing a rescue apparatus. It is important, therefore, to see that the pipes, valves, etc., are of such a size that this amount of air can be comfortably obtained. Any undue resistance to the breathing would cause great distress and might be a source of danger.

Ques.—What quantity of oxygen must the apparatus supply per minute?

Ans.—The amount of oxygen arranged for by the makers of the apparatus is a constant supply from a steel cylinder of 2 liters, or 122 cu.in. per min. This should be regarded as a minimum when a man is walking about or performing moderately hard work. The store of oxygen carried should also be sufficient to maintain this supply for two hours, or for whatever period the apparatus is meant to be used.

Ques.—What quantity of carbon dioxide does a man produce during heavy work in two hours?

Ans.—That depends on the physical energy exerted, or the amount of work done. The Draeger apparatus must be capable of completely eliminating the 94 liters (3⅓ cu.ft.) of carbon dioxide exhaled by a man doing work, during a period of two hours. After some severe tests with the Proto or Fleuss, it was shown that with an oxygen consumption of 2 liters per minute, about 220 liters, or nearly 1 lb., of carbon dioxide would be produced in two hours. This would convert nearly 1 lb. of pure caustic soda into bicarbonate or 2 lb. into carbonate. The tests indicate that 5 lb. of caustic soda would be a safe amount for work underground. The extra quantity is useful in diminishing heating. Since 1 cu.ft. of air (60 deg. F., 30 in. barom.) weighs 0.0766 lb. and the specific gravity of carbon dioxide is 1.529, the space occupied by 1 lb. of this gas at normal temperature and pressure is

$$\frac{1}{0.0766 \times 1.529} = 8\tfrac{1}{2} \textit{ cu.ft.}$$

Ques.—What would you do if you found a feeling of suffocation coming on during work, while wearing the apparatus?

Ans.—I would stop work, inform those with me of my condition, use the bypass if there is one, and if doubtful as to the cause I would then retire to fresh air as quickly as my condition would allow. The cause may be insufficient supply of oxygen due to obstruction in valves or tubes; potash or caustic soda unable to absorb the carbon dioxide exhaled, due to a poor quality; defective breathing bag, or a leaky joint. Collapse may take place before I would be able to retire, and it may be due to overexertion; in which case rest and do less work.

Coal and Coke News

Harrisburg, Penn.

Chairman W. B. Ainey, of the Public Service Commission, has directed the Philadelphia & Reading Ry. Co. to install, within 30 days (from Aug. 17), passenger train service upon the Middle Creek branch, between Swatara Junction and Newton.

The railroad company claimed that the branch was constructed as a mine lateral, and not for the purpose of carrying passengers and that, therefore, the commission was without authority to make any order. Further objections were: Lack of necessity for its service; that the expense thereof would be too great, and that the passenger train would be run at a loss.

Chairman Ainey overruled all of these objections and held that, though the branch might have been built for the purpose of carrying coal, the Act of Assembly creating the branch railroad placed no such limitations upon it and that, therefore, it lawfully might carry passengers.

The decision is regarded as of much importance for the further point decided—which was that it is not an answer to a demand for passenger service to show that the particular train would be operated at a loss. "The first duty of a railroad," the Commission said, "is to perform its proper corporate functions, and, if carrying passengers is one of them, it must perform such duty or give up its charter privileges."

The expense of operating a particular train, involving a loss, may be of more or less importance in determining rates to be charged, but of itself will not justify a railroad in refusing to give to any community reached by its lines such service as may be needed and reasonably demanded by the public.

Can the Surface be Protected?

It will soon be determined whether there are resources in the law for the protection of public property from cave-in damages that are not available for the protection of private property, or whether the law has means of general protection that have not yet been revealed.

The case to be determined comes from the Scranton district. The state armory at that place is endangered by mining. The state armory board has made an investigation and has found that conditions were as represented, due to mining of the coal under the building.

Renewed effort is being made to find some means whereby a remedy may be secured from the cave-in menace. It has been held by some lawyers that public property is in a different class than private property, that notwithstanding deed stipulations, that the surface can be damaged, because the people who purchased the surface built upon it with the stipulation that the owner of the mineral rights be absolved from all liability, coal companies are obliged to protect school houses, streets, etc., the pipes supplying public utilities, and so on. It has also been held that the police powers of the state not yet thoroughly applied in test cases are ample to safeguard the people.

The case submitted to the Attorney General by the state armory board will be awaited with much interest.

Some Reports have been Filed

Considerable interest is being shown in the filing of the first reports of anthracite coal production under the new act (1915). August 20 was the day set for the filing of reports of the July output and a number of the largest anthracite producers did not file. Some leeway will be given by the Auditor General on the filing.

Some objections to the filing by the 20th have been made, because of the contention that the prices are not known much before that time. The contention has also been advanced that dredging is not washing coal and that coal dredged is not taxable, but the state officials take the other view.

It is probable that some stipulations regarding the coal tax assessment will be filed before many weeks.

PENNSYLVANIA

Anthracite

Nesquehoning—The payment of wages to the employees of the Lehigh Coal & Navigation Co. last week was the biggest for a long period, as the miners had been making full time.

Lansford—The employees of the Lehigh Coal & Navigation Co., in the collieries in the Panther Creek Valley are disinclined to accept the provisions of the workmen's compensation act which becomes effective with the first of the year. They claim that the new act is not nearly as favorable as the present code under which they are working.

Jeddo—In the villages of Jeddo, Oakdale, Highland and Harleigh, where collieries are operated, the G. B. Markle Co. is erecting transmission lines to supply electric current for the inhabitants.

Port Clinton—Coal shipments via the Schuylkill Canal, which have been growing less each summer, have now practically ceased. Heavy rains throughout the anthracite region have almost closed the channel with culm and it will take several weeks to restore the canal to navigable condition. It is reported in some quarters that it is the intention to abandon the canal entirely.

Hazleton—The collieries at Black Ridge, which have been operated for over 15 years by the Hazle Mountain Coal Co., have been abandoned, as the company no longer found it profitable to operate them, the veins having been worked out.

Scranton—Officials of the Delaware, Lackawanna & Western Coal Co. recently announced that workmen were still working day and night in an effort to discover the fire which is supposed to be burning in the old workings of the Bellevue mine under Luzerne Street in West Scranton. It is the intention to discover the cause of the hot waves which have been penetrating the other workings of the mine during the past two weeks. Search for the fire is hampered by the many subsidences encountered. It is possible that the fire if it exists, has burned itself partly out, but the intention is to continue the search until the cause of the heat is discovered.

The Hyde Park colliery of the Delaware, Lackawanna & Western Coal Co., will close down for a period of about 10 days while repairs are being made. The Taylor mine will also close down for the same length of time and for the same purpose. The other collieries of the company are working full time, and it is anticipated that this condition of affairs will exist for a considerable time to come.

Coaldale—The Lehigh Coal & Navigation Co. is preparing to remove the water from its No. 9 mine. This mine was flushed last December to extinguish a fire. When cleared of water it will furnish employment for about 100 men.

Bituminous

Johnstown—Highwaymen were foiled recently in their attempt to steal the $10,000 pay-roll of the Greenwich Coal Co. Ordinarily the money was sent by express from here, but owing to the train being late the paymaster, Frederick Vinton, took the money in an automobile. On the same road over which Vinton passed in safety, a short time later the highwaymen attacked the driver of the express wagon and, of course, failed to get the money. The bandits, three in number, were afterward rounded up by two state policemen, one of whom, Daniel Duckler, was badly wounded by being fired upon by one of the men.

Jennerstown—The Berwind-White Coal Mining Co. is beginning to produce coal to be shipped to Italy as a part of the big 300,000-ton order recently awarded to the concern. The Consolidated Coal Co. is also mining for an Italian order.

Connellsville—Complete returns of the 1915 garden competition among the employees of the H. C. Frick Coke Co. were made public on Aug. 20, by the committee of judges. They reported that 6819 heads of families employed at the company's 56 plants, had taken advantage of the offer to cultivate company property, raising vegetables to the value of $186,585. Only 270 of the plots available were not used, and the judges expressed the belief that some of this ground was so sterile as to make its cultivation unprofitable. The coke company buys these vegetables at the current market price.

Shipments of coke from the Connellsville region recently amounted to 378,000 tons per week, the shipments exceeding production. Merchant coke production has risen to nearly 150,000 tons weekly. This is a greater output than at any time since the first half of 1913.

Greensburg—Coal operators in the Greensburg region are reported to have taken all the orders for coal that they can fill between now and Christmas. It is said that every available miner in the district will be given work and all mines will work six days a week. Some mines closed down for years will be opened.

Uniontown—Options on 1300 acres of coal, including the greater part of the unsold coal land in Luzerne Township, Fayette County, have been closed by Pittsburgh interests for $2,500,000. The option will expire on Sept. 10. The coal optioned is surrounded by some of the largest coal and coke interests. On the north are the holdings of the W. J. Rainey Co., on the northeast is the acreage of the Republic Iron & Steel Co., on the east is the land of the Tower Hill Coal & Coke Co., on the south are the holdings of J. V. Thompson, and on the west are the H. C. Frick operations. The coal, according to analysis, contains less than 1 per cent. of sulphur and is considered the best coking coal in the entire region. The options are on the following properties: Miss Adelaide Van Kirk, 65 acres; Mr. and Mrs. G. L. Hibbs, 115 acres; Misses Fannie and Laura Swan, 125 acres; W. J. Stewart heirs, 325 acres; Newall A. Porter, 140 acres; Columbus Porter, 187 acres; Mrs. James Chalfant, 160 acres; James West, 90 acres; Mrs. Sharpnack, 100 acres.

Pittsburgh—More than a dozen coal mines in the Monongahela River-Pittsburgh district have been speeded up during the past week. Coal production is now said to be at a higher rate than at any time this year. The shipments to Lake ports have increased, the steel trade as a whole is taking tonnage fully equal to the busiest season of 1913 and other industries not affected by the European war, have enlarged their consumption so that the demand is rapidly approaching a point where the mines will have difficulty in meeting it promptly. Exports of coal from the district, while rare because of the long rail haul to the seaboard, have actually taken place the last few days. While operators say the export trade will never directly affect this territory it will benefit it by broadening the home market as the demand from abroad will keep eastern mines too busy to supply the domestic markets adequately. According to estimates recently made, 7500 men have been added to the working forces of the coal mines in the district in two weeks, all on full time.

WEST VIRGINIA

Charleston—The following delegates have been appointed by Governor Hatfield to represent West Virginia at the American Mining Congress, to be held in San Francisco, Sept. 20-23: Edward Schoenebaum, George T. Watson, W. H. Koch, A. J. King, Edward O'Toole, E. E. White, Clyde Hutchinson, James Elwood Jones, George S. Patterson and R. P. Maloney.

J. H. Nightingale, commissioner of weights and measures, recently directed that all coal companies operating in West Virginia, pay the miners for the actual coal loaded. Heretofore a limit of 5000 lb. has been fixed as a carload, and all over that amount has been credited to the coal operators. On the other hand, it has been the custom to dock the miners for any shortage found on the cars.

Examinations for certificates as mine foremen and fire bosses will be held throughout the State of West Virginia at the following places and dates: Welch, Sept. 21-22; Logan, Sept. 28-29; Grafton, Oct. 5-6; Mt. Hope, Oct. 12-13; Charleston, Oct. 19-20.

Carlisle—Paul Nowack and John Balko, miners in the employ of the New River company, were discovered some time ago smoking their pipes in the company's mine at Carlisle. They were tried by a justice and fined $20 and costs each. Since Feb. 6 last, the mines have been worked with safety lamps exclusively. On February 6 an explosion occurred killing 21 men. The flagrancy and persistence with which some miners take all kinds of risks in spite of the warnings and rules of the Mine Inspection Department is the cause of much chagrin and disgust to some of the department officials.

Fairmont—The action of the Baltimore & Ohio R.R. Co., in going into the market for additional coal carrying cars and locomotives, has been favorably commented upon by the operators in this section. It is stated that there is now beginning to develop a shortage of cars in the Fairmont district, where all the mines are in full operation, despite the labor shortage which for a time affected some of the operations. It is thought possible that a shortage of cars is not far distant. While railroad officials state that there are still plenty of cars, the surplus stock is rapidly disappearing; consequently large orders have been placed for immediate delivery.

Clarksburg — The Madeira-Hill-Clarke Coal Co. has received sufficiently large orders for export coal to keep the three mines of the company working at full capacity for several months. These mines have been working part time for a considerable period.

Huntington—The Huntington mine rescue car will make a 10 months tour over West Virginia. The object of the tour is to train mine rescue and first aid crews, and to carry the propaganda of safety to the mines. The trip will cover the Chesapeake & Ohio and Kanawha & Michigan lines, and the itinerary of the car will be ready for publication in a few days.

VIRGINIA

Norton—The coke ovens of the Colonial Coal & Coke Co. at Dorchester, and those of the Stone Gap Colliery Co. at Glamorgan are now all in full operation six days per week, while all mines are operating full time, turning out their full capacity.

ALABAMA

Montgomery—The lower house of the Legislature recently passed by a vote of 66 and 31 a bill which, if eventually enacted, would prevent the state after Jan. 1, 1918, from leasing any convict serving a sentence of five years or less to any corporation, and would further after Jan. 1, 1920, prevent the leasing of any convict under any sentence whatsoever. There has been much agitation over the leasing of convicts to coal mining companies, and it is estimated that the result if the action of the House is sustained by the Senate, will be to remove the convicts from the mines and put them to work in farming and road-building in various sections of the state.

KENTUCKY

Logmont—Extensive improvements have been made in the plant, mine equipment and camps of the Luke & Drummond Coal Co., which were taken over some time ago by the Crystal Coal Co. Thirty new houses are being built for miners and all the existing houses have been put in good condition. Fifty new cars have been put into service thereby giving the loader a full turn and more cars will be added. A new fan house has been constructed and all the air-ways and brattices put in order. The incline to No. 3 mine has been double tracked, boilers overhauled and the railroad track extended so as to hold about 25 cars. The commissary will be enlarged and the stock extended. The company has advertised for coal loaders and is pointing to separate schools, a well-ordered camp, payment on the run-of-mine basis, etc., as inducements to labor. The Poplar Lick vein has been opened and will be developed in the near future, it is stated, the vein running from 4 to 6 ft. in thickness. The old Sagamore Coal Co., formerly operated this vein. The Crystal company is under the same management as the Climax Coal Co. at Edgewood. Hiram Silvers is superintendent and Frank Clutts mine foreman.

OHIO

Columbus—The New Method Coal Co. of Columbus, which is developing a stripping proposition in Jefferson County, Ohio, is progressing satisfactorily in the development work. Two large steam shovels have arrived and are being installed. It is hoped to start loading coal by Oct. 10 at the latest.

Millfield—Fire, caused by a gas explosion was discovered in Mine No. 6 of the Poston Consolidated Coal Co. early Aug. 21, and all efforts of the local officials to extinguish it failed. As a result the Ohio Mine Department was notified and J. M. Roan, Ohio Mine Inspector, left on the mine rescue car at noon, Aug. 21, to take charge of the situation.

Bridgeport—Seven thousand dollars were distributed among 3500 miners of this section recently, giving $2 each on what is known as the "unemployment fund" of the miners' organization. Since the scale was signed work at the mines has not been plentiful. The 3500 men have been idle ever since the strike was declared.

Cambridge—The work of pumping out the Kings mine of the Akron Coal Co. has been started and it is planned to resume operations. The mine has been idle for several years and it was filled with water. The mine formerly gave employment to 200 miners.

INDIANA

Boonville—The Big Four Coal Co. is installing electrical and new shaft equipment, to cost $75,000. The coal will be hauled by motors two to three miles underground.

ILLINOIS

Belleville—The shaft of the Summit coal mine, owned by the Summit Coal Co., on the Louisville & Nashville R.R., near here, caved in recently, causing a loss of between $1000 and

$2000. The foundation of the tipple sank 30 ft., the tipple collapsed and the shaker house was thrown out of plumb. The shaft had just been retimbered, the work requiring three weeks. The cave-in was caused by the removal of dirt around the timbers and the heavy rains. The shaft may have to be rebuilt entirely. Nobody was hurt, but it will be several weeks before work can be resumed at the mine.

Millstadt—A contract is about to be closed for the removal of 100,000 carloads of earth from the Northern Coal Co.'s Fischer strip-mine near here and used in the construction of part of the East St. Louis levee. Since the Northern Coal Co. began operating the strip-mine the dirt removed from the top of the coal vein has accumulated until it is a miniature mountain. Three steam shovels are to be used in loading it and six extra trains on the Mobile & Ohio R.R. will carry it to the levee. When the accumulated dirt is removed the steam shovels will uncover a further area of coal and load the cars at a single operation.

IOWA

Des Moines—The Maple Block Coal Co. has opened a new mine at the outskirts of the city. The shaft is 140 ft. deep and 200 men are employed. The daily output will be about 700 tons. The vein is from 3½ to 4½ ft. thick. John Schuler is president of the company.

OKLAHOMA

McAlester—About 150 coal miners at Savanna have been reemployed, and the output of the McAlester coalfield increased approximately 400 tons per day by reason of an agreement concluded between the Savanna mine and the Savanna Mining Co. The latter firm takes over the operation of the Savanna property which formerly belonged to the Dow Coal Co. which went into bankruptcy last February.

WASHINGTON

Spokane—Anthracite coal, of good quality, and in quantities to make it of interest to the commerce of the Pacific Northwest, has been found on patented claims in Whatcom County, owned by Alexander Polson, of Hoquiam. Mining engineers have made an investigation for Mr. Polson, and it is reported that 3,000,000 tons are already blocked out by these experts. Furthermore, it is stated that this 3,000,000 tons is but a small fraction of the total deposit.

FOREIGN NEWS

London, England—It is reported unofficially that the main demands of the Welch coal miners for higher wages has been granted by Walter Runciman, president of the Board of Trade, with whom representatives of the mine workers have been conferring.

PERSONALS

J. O. Hobby was appointed treasurer of the American Locomotive Co. at a recent meeting of the directors of that firm.

E. C. Lee has been made an inspector of coal mines for the associated insurance companies with main office in Pittsburgh, Penn.

J. J. Strickler, of Lansford, Penn., employed by the Lehigh Coal & Navigation Co. as a foreman, has announced himself as a candidate for the office of mine inspector of Carbon County.

Juan Garcia, 51 years of age, is the oldest employee in point of service on the payroll of the Colorado Fuel & Iron Co., in Colorado. Garcia works at Rouse and has been employed continuously at that camp since 1885.

H. C. Campbell, for 10 years in charge of the mines of the Central Coal & Coke Co., of Kansas City, Mo., has resigned. Mr. Campbell was recently elected president of the Campbell Glass & Paint Co., the interests of which firm demanded his entire time.

James M. Page, of Strong, Colo., superintendent of the Sunnyside Coal Mining Co., recently made an inspection trip through the Routt County coalfields, paying particular attention to equipment and methods of preparation of coal throughout that section.

H. H. Henderson has been placed in charge of the Pittsburgh office just opened by the Goulds Manufacturing Co. in the Oliver Building of that city. Mr. Henderson has been representing the company in northern West Virginia and southeastern Ohio. E. C. Wayne has been appointed assistant manager.

W. J. Hamilton has retired from the William J. Hamilton Co., a concern which he established several years ago, and which is located in the Schultz Building, Columbus, Ohio. He will continue in the coal jobbing business and is organizing the W. J. Hamilton Coal & Coke Co., and will have offices in the Columbia Building.

R. E. Hall, former manager of the Boston office of the Goulds Manufacturing Co., and W. E. Dickey, formerly of the New York office, and both vice-presidents of the company, have taken charge of the sales organization of the firm. Mr. Hall is now located at Seneca Falls, the home office of the firm, while Mr. Dickey has charge of all business in southern Southwestern and Southern Pacific states.

George M. Carpenter, formerly fuel inspector for the Nashville, Chattanooga & St. Louis Ry., now connected with the Clinchfield Fuel Co., of Spartanburg, S. C., will make the trip as representative of his company with the 5000 tons of coal which is to go as the first shipment on the contract his company has with the Buenos Aires & Pacific Ry. While in South America he will investigate conditions in an effort to find a market for American coal.

OBITUARY

John L. Phillips, aged 47, for several years mechanical engineer for the Mount Morgan Coal Co., was found dead in bed at Williamsburg, Ky., recently. He had been a sufferer from heart disease. His mother and sister survive.

John C. M. Day, widely known as a coal, timber and railroad man of eastern Kentucky, died recently at his home in Winchester, Ky., following a long illness of Bright's disease. For several years, until his health failed, Mr. Day was president of the Mountain Central R.R. and was also interested in numerous coal and timber projects in the eastern Kentucky field. Mr. Day was born in Breathhitt County in 1859. He is survived by his wife and four children.

RECENT COAL AND COKE PATENTS

Grate Bar. E. C. Clark, Nutley, N. J. 1,145,349, July 6, 1915. Filed Oct. 10, 1912. Serial No. 724,907.

Grate Bar. C. W. Hopes, Glen Falls, N. Y., 1,140,158, May 18, 1915. Filed July 21, 1914. Serial No. 852,176.

Coal Cleaner. J. R. Montgomery, Frankfort, Kan., 1,140,999, May 25, 1915. Filed May 25, 1914. Serial No. 840,807.

Fuel Feeding Apparatus. G. L. Swift, Chicago, Ill. 1,140,207, May 25, 1915. Filed June 16, 1910. Serial No. 567,149.

Furnace Fire Grate. J. Carew, Liverpool, Eng. 1,147,605, July 20, 1915. Filed June 12, 1913. Serial No. 773,306.

Coal Jigging Plant. Christian Simon, Essen-Ruhr, Germany, 1,144,735, June 29, 1915. Filed Apr. 17, 1914. Serial No. 832,627.

Gas Producing Furnace. F. C. Hamilton, Kansas City, Mo. 1,145,892, July 13, 1915. Filed Apr. 26, 1913. Serial No. 763,734.

Steam Boiler Furnace. I. C. Dakin, West Newton, Penn. 1,147,216, July 20, 1915. Filed Apr. 7, 1914. Serial No. 830,197.

Tunneling Machine. W. W. Giggey, Netherland, Colorado, 1,140,673, May 25, 1915. Filed Mar. 13, 1912. Serial No. 683,520.

Combustion of Fuel. P. O. Perkins, Salt Lake City, Utah. 1,146,732, July 13, 1915. Filed May 6, 1915. Serial No. 26,222.

Mining Machine. J. E. Flexner and E. O'Toole, Gary, W. Va., 1,143,897, June 22, 1915. Filed July 8, 1912. Serial No. 708,122.

Electric Motor Driven Coal Cutter. R. Martin, Irvington, N. J. 1,145,331, July 6, 1915. Filed Jan. 27, 1912. Serial No. 673,927.

Smoke Consumer. G. O'Neill, Moncton, New Brunswick, Canada. 1,145,504, July 6, 1915. Filed Jan. 18, 1915. Serial No. 2870.

Process for Burning Powdered Fuel. H. L. Doherty, New York, N. Y. 1,145,356, July 6, 1915. Filed Dec. 31, 1909. Serial No. 535,844.

Device for Detecting Incomplete Combustion. A. E. Carr, Liverpool, Eng. 1,143,889, June 22, 1915. Filed Mar. 13, 1913 Serial No. 753,928.

Coke Oven. F. Peiter, assignor to Gas Machinery Co., Cleveland, Ohio. 1,146,442, July 13, 1915. Filed Feb. 24, 1913. Serial No. 750,228.

Electrically Operated Mine Door. W. W. Murray and J. F. Dillon, Dearing, W. Va. 1,145,787, July 6, 1915. Filed July 31, 1914. Serial No. 854,294.

Elevation Adjusting Means for Chain Grates. H. A. Poppenhusen, Hammond, Ind. 1,144,502, June 29, 1915. Filed Jan. 22, 1915. Serial No. 3695.

Process for Converting Fine Coal Into a Marketable Fuel. J. Evans, Melbourne, Australia, 1,140,735, May 25, 1915. Filed Aug. 14, 1913. Serial No. 784,718.

Method of Operating Gas Producers. H. Koppers, assignor to H. Koppers Co., Chicago, Ill. 1,146,627, July 13, 1915. Filed July 27, 1914. Serial No. 853,349.

Bit Holder for Mining Machines. N. D. Levin, assignor to Jeffrey Mfg. Co., Columbus, Ohio, 1,140,173, May 18, 1915. Filed Jan. 8, 1909. Serial No. 471,298.

Apparatus for Manufacturing Coal Gas. H. Bruce, assignor to Bartlett-Hayward Co., Baltimore, Md. 1,144,977, June 29, 1915. Filed Jan. 7, 1914. Serial No. 810,723.

Boiler Flue Cleaner System. F. W. Linaker, assignor to Vulcan Soot Cleaner Co., Pittsburgh, Penn. 1,144,553, June 29, 1915. Filed Mar. 8, 1915. Serial No. 12,793 .

INDUSTRIAL NEWS

Pittsburgh, Penn.—The Pennsylvania coal dock at Wanatah, Ind., has been placed in service, although the work of construction is still in progress and it will be some time before the dock will be completed.

Fairmont, W. Va.—The Consolidation Coal Co. recently closed a contract with the Egyptian Rys. for the delivery of 60,000 tons of coal in the near future. This company is now preparing to load approximately 140,000 tons of fuel on vessels either in port or expected to dock shortly.

Bluefield, W. Va. — Two electric locomotives recently brought a train of 70 cars containing something over 5000 tons of coal, to this city. This is believed to be the largest train ever brought in by electric locomotives. The previous record for number of cars was 68. Trains containing 65 cars are a common occurrence.

Cleveland, Ohio—It is stated that every railroad entering Cleveland is now storing coal in large quantities or making preparations to store it, in anticipation of a possible coal shortage this winter and the coming spring. This action follows that of the Pennsylvania Lines which have been storing considerable quantities of coal in Pennsylvania.

Pittsburgh, Penn.—The Distribution Branch of the United States Immigration Service recently received a call from the Quemahoning Coal Co., Somerset County, Penn., for 200 coal miners. The New River Association, which operates mines in Fayette County, W. Va., also asked for 300 men. This is regarded as an indication of the improvement in industrial conditions in the above-named districts.

Washington, D. C.—The Interstate Commerce Commission has allowed the increase of 25c. per gross ton in anthracite coal rates from Pennsylvania to Chicago, and other Illinois points covered by the Chicago rates; also to St. Louis and points in the same district. The tonnage affected is about 2,500,000 tons annually, and the principal railroads to benefit are the Erie, Lackawanna and Lehigh Valley.

Steubenville, Ohio—The directors of the LaBelle Iron & Steel Co. have awarded to the H. Koppers Co., of Youngstown, Ohio, a contract for the construction of a byproduct coking plant of 96 ovens, which will cost about $2,000,000. The plant will be constructed on the West Virginia side of the Ohio River, opposite the company's plant on the Ohio side, and will be connected with the present plant by a bridge.

Hazard, Ky.—The Buffalo Creek Branch of the Lexington & Eastern R.R. from Lothair 5 miles up Buffalo Creek, and the First Creek Branch into new coal fields surrounding Hazard are nearing completion. Both will open extensive new coal fields where a number of operating companies are at work getting into readiness to begin shipping coal. It is expected that both branches will be completed within 30 days.

Des Moines, Iowa—Three suits have been started in the Polk County district courts to test the validity of the new workmen's compensation law. The latest is Charles Severline against the Economy Coal Co., in which the plaintiff claims $625 for injuries. The plaintiff was not under the compensation act at the time of the accident. The law removes "common law" defenses such as contributory negligence, assumption of risk and fellow-servant rule, whenever an employer fails to come under its provisions. In the cases now on the docket the coal companies will attempt to have this part of the statute declared invalid.

New Orleans, La.—Coal will shortly be brought from the Pennsylvania, West Virginia, Alabama, and other fields, in barges and boats to New Orleans. It is estimated that the increase in rates on coal granted the railroads from these fields will mean $150,000 a year added expenditure for consumers here. A company is in formation to transport the coal in barges to this port, by way of the Mississippi, Ohio and other rivers.

Columbus, Ohio—The supreme court of Ohio will be asked to enjoin the examination of the books of the Hocking Valley R.R. by the Sunday Creek Coal Co. experts, who were appointed as special employees of the state by the Utilities Commission. A motion has been filed that the Commission vacate its order directing these experts to make the examination. The objection made is that the experts appointed to act for the state are not disinterested.

Cincinnati, Ohio—It is reported that during the recent past, the Pennsylvania R.R. has put into commission every available engine and car along its lines. This has been due to the heavy orders for coal transportation from the mines to the eastern seaboard. It is said that within the recent past more than 1,400,000 tons of coal has been contracted for by coal mining companies in western Pennsylvania for France, Italy, Spain, Portugal and Egypt.

Washington, D. C.—The coal-carrying railroads which are affected by the decision of the Interstate Commerce Commission reducing the freight rates for the transportation of anthracite, are expected to decide shortly as to the course of action to be pursued with the view of contesting the findings of the commission. It has been estimated that the nine coal-carrying roads will lose approximately $8,000,000 per year in earnings under the new rates which become effective Oct. 1 next.

Chicago, Ill.—The Illinois properties of the Dering Coal Co. at Westville and West Frankfort, have been sold under foreclosure to the Producers Coal Co., of which F. S. Peabody is president. The transfer of these properties has already been made. No disposition has yet been made of the Indiana holdings of the Dering Coal Co. Mr. Peabody will have entire charge of the management of the new company, and is negotiating with J. K. Dering of the J. K. Dering Coal Co., to continue handling the product of these mines.

Pottsville, Penn.—A section of one of the first, if not the first, railroads in the United States was unearthed on Aug 21, by Foreman Nelson Clayton, of the Pottsville Water Co., who had a gang of men excavating in Coal St. It is a narrow-gage railroad, and was originally used to bring coal to the Schuylkill Canal, when that waterway ran into the heart of Pottsville. Now the old canal is filled with coal dirt and culm for a distance of 25 miles from here. It is said the railroad was laid prior to 1830. The rails and sills are in an excellent state of preservation.

Philadelphia, Penn.—It is reported that shipping men and freight brokers of Philadelphia have received inquiries for shipment of cargoes of coal to Liverpool, England. For some time past, England has been unable to supply coal to her allies, and the price of coal abroad has risen in some instances to as high as $27 a ton. Inquiries from England itself are a surprise here although it has been known for some time that the output of English mines has been decreased decidedly on account of the enlistment of miners and because of labor troubles.

Baltimore, Md.—Suit has been entered in the U. S. district court at Baltimore by the Consolidation Coal Co., in which it seeks to recover $105,000 damages from the Munson Steamship line, a New York corporation, for alleged breach of contract to transport 12 cargoes of coal from Baltimore to ports in Italy. The European war and the attendant dangers to trans-Atlantic vessels, occasioning a shortage in the number of available freighters, is believed to have caused the alleged breach. Since Apr. 1, it is asserted, the defendants have failed to comply with their agreement to transport one cargo monthly.

Shoshoni, Wyo.—It was reported here recently that H. O. Barber, general manager for the Poposia Coal Co. at Hudson, has offered to build a grade from Shoshoni to the Shot Gun coal fields, providing the Northwestern R.R. would lay the steel for a railroad to that point. The Shot Gun fields lie about 43 miles west from this point and are said to contain the best coal in the state. In this field there are five or six out-croppings, which show for a distance of about three miles. These veins run from 4 to 26 ft. in thickness and the indications are that these veins eventually combine in one large vein.

Coal Trade Reviews

General Review

Full winter schedule on anthracite now at hand and business will slow down pending cooler weather. Indications of a stiffening in bituminous. Foreign inquiries from Great Britain. Retail buying gaining momentum at interior points.

Anthracite—Buying showed the customary month-end spurt, and it is noted that more inquiries are appearing as the season advances. The movement continues slow, however, and with the full winter's schedule now in effect, it will require some evidence of winter weather to inject any activity into the market. The domestic grades are in plentiful supply and are inclined to heaviness but the steam sizes are fairly strong although any demand for these is easily met. The unusually attractive terms offered retailers, as regards credit and prices during the summer, has resulted in heavier stocking than is usually the case. The strong position of the independent operators, as indicated by the increased price cutting is causing no little concern.

Eastern Bituminous—The large export trade and rigid curtailment in mining operations are tending to keep supplies down to a healthy basis with the result that prices are fairly well maintained in spite of the fact that the maximum dullness of the season is apparently at hand. The request for bids from a large Eastern railway system and from the Panama Canal R.R. are two important inquiries now pending. Some observers see a slight but well defined stiffening in the demand for coal which is being reflected in the firmer attitude operators are taking as regards prices for future delivery. There is hardly any doubt that industrial conditions are picking up slightly but operators are still actively canvassing for business, and minimum prices are the rule.

Export Trade—Many of the foreign inquiries on which negotiations have been in progress for some time, have been closed. In addition to this bunkering trade is showing a substantial increase, vessels now usually taking all the possible tonnage at this end because of the uncertainty as to obtaining supplies abroad. A feature of interest in export circles during the week was the receipt of several inquiries for shipment to England. The heavy movement to Italian ports still continues and some large cargoes have gone to South American points also. Vessel rates in the off-shore trade are slightly stronger, particularly to Italy, and with grain shipments soon to be competing for tonnage, the indications point to a still further advance.

Lake Markets—The situation in the Pittsburgh district is distinctly better. The railroads are taking slightly larger tonnages and the effect of the long continued improvement in the steel industry is at last beginning to be noticed. The demand is chiefly against contracts. The heavy rains in Ohio have had an adverse effect on the market although the general tone is slightly better. Retail buying continues light in spite of the advancing season and it is thought that this will cause an unusual rush for coal later to make up the deficiency. A great many companies are still obtaining their current requirements in the spot market but a moderate tightening of the situation will force them to contract. There is no improvement in the Lake movement which is proving a decided disappointment. In the Southern market the cotton mills are reported to be doing considerable buying which has stimulated some activity in that direction.

Middle West—Retail buying is gradually obtaining momentum as the season advances, and there is perhaps a slight improvement in the steam market, though not of important proportions. It is not believed that much further improvement can occur until some cool weather forces consumers into the market. The outlook in the Lake trade continues as discouraging as ever, but some favorable signs are noted in general industrial conditions. The enormous crops are having a decidedly beneficial effect on sentiment and some of the larger railroad systems are reported to be stocking up against a possible stringency in the market this fall.

A Year Ago—Heavy rail shipments in anthracite and business is moderately active already. Eastern bituminous situation still improving. Orders on shipments for foreign markets are being reported. Trade slowing expanding and will be active shortly. Lake shipping better.

BUSINESS OPINIONS

Boston News Bureau—It is certainly a most remarkable situation. The quickness with which the security market came back on request of the German ambassador that this country withhold action on the "Arabic" case until the German government has forwarded an explanation shows the sensitiveness of the situation. But the fact is that we as a people are growing immensely rich as a result of the foreign war. General trade, to be sure, is still chiefly confined to war orders, but the buying power is increasing enormously. Gradually the idea is permeating the country that the prosperity that is coming to us cannot be downed. There is more confidence appearing, therefore, in every quarter. With the harvests of the immense crops, now practically assured, our wealth will be prodigious, and this must find vent in new business enterprises and must naturally increase the investment ability.

Iron Age—That the Steel Corporation would buy pig iron has been persistently reported, but it is stated on the highest authority that it will not. It has seven Northern furnaces of modern calibre that can yet be put in, and the furnaces now active, 90% of the total capacity, are making larger outputs than ever. A Pittsburgh steel company has just bought 25,000 tons of basic iron for this year. Rails cannot now be had for early delivery. In the past week 30,000 tons were placed, of which 15,000 tons, which goes to Alabama, cannot be delivered before October. At Chicago a Western road has bought 11,000 tons of tie plates, and the price there has advanced from $27 to $28.

American Wood and Cotton Reporter—Scoured wools have been a feature of the wool market for the last week, including especially Australians. The large foreign orders have created a demand for these wools. Territory wools have been sold in large quantities, particularly Montana wools. The market is still very strong. In the woolen and worsted goods market the situation is very interesting, with the outlook continually becoming brighter for woolen goods producers.

Raleigh Coal & Coke Co.—Speaking strictly for ourselves, we consider that we are warranted in buying and stocking larger quantities and wider variety of materials than heretofore. More than 50% of our business associates are optimists.

Dun—International monetary complications and disturbances in the ranks of labor constitute the chief elements of uncertainty in the general situation. There is, however, nothing either unsound or disquieting in strictly domestic finance, and though further controversies between employers and wage earners have arisen, serious and protracted troubles have thus far been averted.

Bradstreet—Trade continues to broaden, industry to quicken and optimism to spread, without, however, diminishing conservatism or allowing sight to be lost of the unsettled aspect of international political matters. Orders given by visiting merchants are responsible for expansion in house trade, which might be greater were it not for cool, wet weather in the West and the belated movement of grain to market. Cereal crops, on the whole, promise excellent yields, prospects in the Northwest being particularly propitious.

The Southern Lumberman—With statistics compiled by the Southern Pine Association showing that yellow pine manufacturers have unfilled orders on hand for over 16,000 cars and that a net reduction in stocks on hand at mills in that association amounted to 3% in July, the optimistic tone to the yellow pine business that became manifest about the middle of July not only continues, but has been considerably enhanced during the past week. Reports from both producing and distributing centers are practically unanimous that business is better. The improvement has also been reflected in the demand for hardwoods.

Marshall Field & Co.—Wholesale dry goods distribution has been lighter in volume than during the same week a year ago. Unseasonable weather continues to effect retail selling adversely.

ATLANTIC SEABOARD

BOSTON

Hampton Roads coals very dull. Railroad asks for bids on supply for part of 1916 and thereafter. Georges Creek demand light and Pennsylvania grades stagnant. Water freights quiet, with steamers now available. Discussion of anthracite possibilities tends to help trade.

Bituminous—The Pocahontas and New River market seems to have reached the apex of dullness for the season. Prices are apparently unchanged either f.o.b. or alongside Eastern points, and shipments on contract have been about normal for this season. The Boston & Maine R.R. is soliciting proposals for transportation for one year and for five years beginning Sept. 1, 1916 and Nov. 1, 1917, and for 720,000 tons of bituminous either f.o.b. loading port or alongside Boston for one year, or 3,000,000 tons for five years, beginning Apr. 1, 1917. It will be interesting to see what shippers are willing to discount the future to that extent.

There would probably be concessions in price among certain of the Pocahontas and New River coals were there any inquiry, but as it is the export trade, in conjunction with curtailed mining, is keeping down the volume of coal standing at the loading piers. Most of the shippers are doing a fair current business and at this writing are perhaps showing less anxiety over the future of the market than since the beginning of 1915.

The demand in New England for Georges Creek is very light just now. The more prominent shippers of this grade have made special efforts to interest the trade in their Pennsylvania coals and each year the tonnage of Georges Creek is likely to diminish in this territory.

Only occasional spot sales relieve the stagnation in the Pennsylvania grades. Prices continue on a minimum basis, and operators are actively canvassing for winter business. Certain of them have named prices a year ahead, subject to advances in wages and tolls.

Water Freights are still nominally 75c. Hampton Roads to Boston, on 3000 tons upward. Steamers are available at the same rate, but so far there have been no takers. Because of dispatch requirements steamers will have to accept less before they are freely chartered in competition with barges.

Anthracite—There has been some discussion of the effect of the recent 15c. reduction in tolls, but it is pretty well understood now that more than that will have to happen to make coal cost any less in New England. Whether there will be any pronounced shortage of labor during the fall and winter is a more pressing matter. There are different views on this and much will depend on how the fall trade starts.

Boston retail prices were advanced 25c. on all sizes, effective Aug. 16. This makes the present basis $7 for broken, $7.75 for egg and stove, $8 for chestnut, and $6 for pea.

Bituminous prices at wholesale are about as follows:

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines*	$0.85@1.40	$1.15@1.60	$1.67@1.77	
Philadelphia*	2.10@2.65	2.40@2.85	2.92@3.02	
New York*	2.40@2.95	2.70@3.15	3.22@3.32	
Baltimore*			2.85@2.95	
Hampton Roads*				$2.70@2.85
Boston†				3.55@3.68
Providence†				3.45@3.68

* F.o.b. †On cars.

NEW YORK

Month-end spurt creates some activity in anthracite. Considerable interest evidenced in the labor outlook. Slight improvement in bituminous and the outlook regarded as encouraging. Bunkering and export trade active.

Anthracite—With the approach of September a slight improvement is evident in the anthracite market. Not that there is much more coal being shipped but there are more inquiries and sales are now more regular. Even if the retailers have no immediate sale for the coal they will have the boats towed to their plants and discharge as soon as it is possible.

Mining is still restricted to three or four days each week. All of the inactive sizes are going into stock and the storage plants of the various railroads are becoming so filled that capacities will soon be taxed.

The labor situation will soon begin to take definite shape. The general activity in the industry this year will benefit the companies in that they have been able to place so much fuel in stock. The miners are strengthening their forces by more thorough unionizing and Pres. John P. White of the United Mine Workers of America is reported to have promised the men that he will obtain recognition of the union and the eight-hour day if they unionized one hundred per cent.

Stove is the leading domestic size in demand with egg second. There is very little call for chestnut which is still selling at from 30 to 40c. off circular. Pea has bettered its condition moderately and is commanding slightly higher figures. Buckwheat is still long. Rice and barley of the better grades continue in fair demand with loading delayed from two to three days.

The average quotations of the week follow:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$4.95		$5.00	
Egg	5.20@4.70	$4.90@5.20	5.25	$5.00@5.25
Stove	5.20	4.90@5.20	5.25	5.00@5.25
Chestnut	5.45	5.00@5.45	5.50	5.10@5.50
Pea	3.50	3.00@3.15	3.50	2.75@3.00
Buckwheat	2.75	2.00@2.25	2.80	2.10@2.35
Rice	2.25	1.70@1.85	2.30	1.90@2.10
Barley	1.75	1.45@1.70	1.80	1.65@1.80

Bituminous—There is a slight improvement over last week and sales agents are more cheerful. The usual contract tonnage is moving uniformly with mining being restricted to that amount; consequently there is little spot coal and there are not so many bargains to be picked up as was possible a fortnight ago. A few sales of West Virginia coals have been reported during the week at sacrifices. As many of the manufacturing plants along the Sound and throughout southern New England are making extensive additions the prospect for increased tonnage to these establishments seems good. The holders of the present contracts will no doubt have the first call on the new business but price counts and keen competition is bound to occur.

The bunkering tonnage increased this week as the number of steamers in the harbor was greater than at any time since early in the month. Then too, vessels must take on all coal possible owing to the uncertainty of being able to replenish their supplies abroad. The export business continues to gain strength. Inquiries made last month are rounding into actual business and some large orders have been placed with the leading operators.

Current quotations are on the following basis:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.20@3.30	$3.20@3.30	$3.20@3.30	$1.75@1.85
Georges Creek Tyson	2.90@3.00	2.90@3.00	2.90@3.00	1.35@1.45
Clearfield:				
Medium	2.65@2.80	2.55@2.65		1.10@1.25
Ordinary	2.55@2.60	2.55@2.60		1.00@1.10
Broad Top Mountain				1.10@1.45
Cambria County:				
South Forks	2.90@3.05			1.35@1.50
Nanty Glo	2.75@2.80			1.20@1.25
Barnesboro	2.65@2.70			1.10@1.15
Somerset County:				
Quemahoning		2.70@2.85	2.70@2.85	1.20@1.30
Medium	2.65@2.70	2.60@2.65	2.60@2.65	1.10@1.15
Latrobe	2.45@2.55			.90@1.00
Greensburg	2.75@2.80			1.10@1.15
Westmoreland	3.15@3.20			1.35@1.45
West Virginia Fairmont ¾		2.60@2.70	2.60@2.70	.80@ .90
Fairmont mine-run		2.45@2.55	2.45@2.55	.75@ .85
Steam		2.45@2.50	2.45@2.50	.90@ .95
Western Maryland		2.40@2.45	2.40@2.45	.85@ .90

PHILADELPHIA

Anthracite slightly improved, although trade continues very dull and little buying being done. Stove plentiful with egg in fair demand, while chestnut lags hopelessly. Pea weak, with other small sizes fair. Bituminous is quiet, with good future and the exports growing stronger.

Anthracite—Probably there have never before been so many coal dealers in Philadelphia away at one time as there has been no one with authority to buy coal. However, despite this condition it is at least possible to report a slight improvement, due in part to a few regular dealers who buy a little toward the end of the month to save the 10c. advance.

Stove is considerably more plentiful, and it is barely possible that the unsettled condition in the tidewater freight rates has had an effect. Egg is still in fair demand, especially since the New England market continues to take quite a tonnage of this size. Chestnut lags hopelessly, as it has for some time, and pea has not stiffened any. Several fair sales of this latter size are reported at $1.60, with an adjustment of 10c. a ton to equalize the freight rate. The other steam sizes are fairly strong, but the demand is easily met, even with the collieries on reduced time, besides which there are several idle washeries that could be worked in case the call for these sizes should become greater.

Practically all dealers are apparently carrying capacity stocks. The condition of the market, from the standpoint of the retailer, has been such as to make the policy of stocking heavily a sure thing, especially since most of it has been done with the operators' capital. Owing to the large supplies on hand it is extremely difficult now to induce them to take in more coal, even if they had room for it.

However, it is only a matter of a very short time when some of this coal will begin to move.

The recent and continued price-cutting has made the large operating companies realize the growing strength of the individuals and it will not be surprising to see some unusual efforts put forth by the sales agents of the big companies early this fall. It is known that this question has been given considerable thought and consideration during the summer and it is likely that the plans will be developed in a short time, although the recent rate decision may have a tendency to modify any arrangement to this end.

The circular prices, to which should be added the Pennsylvania State tax of 2½% per ton, are as follows:

	Line	Tide		Line	Tide
Broken	$3.40	$4.65	Pea	$2.50	$3.25
Egg	3.65	4.90	Buckwheat	1.25	2.25
Stove	3.90	4.90	Rice	.85	1.75
Chestnut	4.05	5.15	Barley	.50	1.50

Bituminous—While the trade is still quiet there are indications that an increased demand will soon be in evidence. Additional furnaces and steel plants are going into operation and increased time is noted at other plants. The trade was quite surprised at inquiries being received from England the past week and these together with the continued requests from other foreign lands is keeping the export business brisk, with prices good and showing indications of doing better.

In the domestic trade there has been no change in prices but with a labor shortage becoming more apparent weekly many of the small operators are inclined to accept business at a reduced price rather than have their operations shut down and their force scattered. Formerly in time of need the operators could send a representative to meet incoming immigrant ships and secure all the labor needed, but all of this is now changed. Slack coal still continues in active demand, but without any perceptible change in price.

The ruling prices are:

Georges Creek Big Vein	$1.65@1.75	Fairmont gas, mine-run	$1.15@1.25
South Fork Miller Vein	1.50@1.60	Fairmont gas, slack	.70@ .80
Clearfield (ordinary)	1.00@1.20	Fairmont lump, ordinary	.85@ .95
Somerset (ordinary)	1.00@1.15	Fairmont mine-run	.75@ .80
West Va. Freeport	.85@ .95	Fairmont slack	.55@ .65

BALTIMORE

Trade slowly stiffening. Fall outlook most encouraging. Orders increasing. Car shortage more evident, and lack of labor being felt.

Many buyers are now feeling out for more coal. Mine operators are showing less inclination to sell at recent prices, at least in any quantity. Low grade coals of West Virginia and Western Maryland go at less than 80 and 85c. now, while the more ordinary products of Pennsylvania are holding at from 90 to 95c.

Reports of a car shortage are coming in. A number of operations along both the Pennsylvania and Baltimore & Ohio reported not more than 20 to 50 per cent. of their apportionment delivered during the week. With the demand on contract now coming closer to normal and new business developing, some embarrassment was occasioned. Growing scarcity of labor is worrying many operators, also. Thousands of miners have returned to the old countries, while others have been drawn to more lucrative lines. The labor situation is likely to be an important factor this fall and winter.

Export business, which suffered a relapse the second week of the current month, picked up again the past week, when a total of 52,194 tons was loaded here for foreign ports. With the large number of charters announced recently it is expected that this business will more than hold its own.

HAMPTON ROADS

Week's movement shows up well. Prices unchanged on standard grades. Foreign demand continues heavy. Occasional shortages of coal.

During the week all of the piers have been well supplied with vessel tonnage which has been taken care of promptly. In the case of the Chesapeake & Ohio Ry. at Newport News they have been compelled to put into operation again their old wooden pier No. 12 where considerable barge and schooner tonnage has been taken care of.

In addition to the export movement to Italian ports there has been some large cargoes to the South American market, while the coastwise shipments have shown up well and the government has also taken some cargoes. The American steamer "Newton," which has heretofore been in the Eastern coastwise trade, loaded a cargo of about 7000 tons for the government for delivery at San Francisco.

Although the quantity of coal on hand appears somewhat excessive it is noted that a number of the larger shippers are having considerable difficulty keeping sufficient coal at Tidewater to take care of vessel tonnage as fast as it arrives.

The demand for coal for prompt movement foreign is still holding up well with every indication of continuing so. Prices are practically unchanged on the standard grades of mine-run coal.

The outlook is bright for record dumpings by the Chesapeake & Ohio Ry. during the month of August, while those for the Virginian Ry. will also be heavy but it is difficult at this time to make an estimate on the Norfolk & Western figures although it is not believed that this road will go above its July dumpings.

Railroad Tonnages—Dumpings over the local piers for the past several weeks compare as follows:

	Week Ending				
Railroad	July 24	July 31	Aug. 7	Aug. 14	Aug. 21
Norfolk & Western	197,913	188,593	135,357	171,252	....
Chesapeake & Ohio	96,627	84,018	110,861	83,390	129,826
Virginian	86,523	39,335	64,397	63,066	77,136
Totals	381,063	311,949	310,515	317,708	206,962

OCEAN FREIGHTS

A number of steamers to load coal for South American, Mediterranean and West Indian ports have been chartered during the past week; freight rates to these destinations are stronger than a week ago, especially to West Italy. The grain competition is increasing and the general impression is that rates on coal will advance rather than decline.

The freight market is now quotable as follows:

To	Rate	To	Rate
Havana	$2 75@3 25	Bermuda	**$3.00**
Cardenas or Sagua	3.00@3.50	Vera Cruz	3.25@3.75
Cienfuegos	3.25@3.50	Tampico	3.25@3.75
Port au Spain, Trinidad	3.50	Rio	8.28@8.40
St. Lucia	3.25@3.50	Santos*	8.40@8.64
St. Thomas	3.00	Montevideo	**8.04**
Barbados	3.50	Buenos Aires or La Plata†	**8.04@8.16**
Kingston	3.00@3.50	Rosario	**8.40**
Curacao	3.25	West Coast of Italy	9.84@10.08
Santiago	3 25@3.50	Barcelona**	8.66@9.00
Guantanamo	3.25@3.50	Valparaiso or Callao	7.00
Demerara	4.50@5.00	Marseilles	9.00@9.24

Note—Rates noted in **bold face** type are only approximate.

* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British steamers; neutral steamers are more difficult to obtain and the rates are always higher.

W. W. Battie & Co.'s Coal Trade Freight Report.

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge. 24c. per net register ton per day demurrage."

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	To	Tons	Rate
Petra	Port Limon	1292	
Stormount	Antilla	1231	
Catherine	St. John	196	1.90
May V. Neville	Porto Rico	1043	

BALTIMORE

Vessel	To	Tons	Rate
Alf	River Plate	1970	8.16
Gretaston	Barcelona	2178	
Harfiete	Spezzia	3021	
Claveresk	Felton Cuba	2441	
Bayard Hopkins	Vensuela	212	
Coila	Piracus		
Newstead	Chipara		
Polarstjernen	Gothenburg	2199	
Hellenic	Sweden	2667	
Liouria	Italy	1958	
Silvia	Savona	2306	
Allanton	Taranto	2775	

VIRGINIA

Vessel	To	Tons	Rate
Unita	River Plate	2344	8.04
Teespool	Rio Janeiro	2938	8.28
Embiricos	River Plate	2670	8.16
Iolo	River Plate	2502	8.10
North Pacific	River Plate	2493	8.10
Othon Stathatos	River Plate	1957	8.10
Cyfarthia	Santos	1959	8.40
Jata Mendi	Italy	2746	9.96

ATLANTIC RANGE

Vessel	To	Tons	Rate
Buxton	Italy	2027	9.48
Oakland Granfie	Marseilles	2927	8.88
A. J. Sterling	Moncton	148	1.90
M. A. Bellliveau	Yarmouth	199	1.65

Note—Steamers are indicated by **bold face type**, all others being schooners.

VESSEL CLEARANCES

The following steamers have cleared from Hampton Roads Aug. 13 to Aug. 20.

NORFOLK

Vessel	Destination	Tons
Br. S. S. Boyne[1]	Rio de Janeiro	6029
Br. Stormount[2]	Havana	....
It. Eliopoli	Genoa	5520
Nor. Ocland	Canal Zone	4700
Br. Kintail	St. Vincent, C. V. I.	5418
Nor. Ydun	Kingston	1800
Nor. Antares	Vera Cruz	....
Br. Lexie	Montvideo	5234
Grk. E. S. Embiricos	Buenos Aires	6242
It. Phoebus	Elba	4500
It. Attualita	Maddalena	6928
Br. Nailsea Court	Buenos Aires	4613
It. Italia	Civita Vecchia	4233
It. Luzon	Genoa	5602
Am. Sch. Gen'l E. S. Greeley	Pernambuco	1838
Br. S. S. Don Arturo	Buenos Aires	4948
Nor. Taunton	Kingston	1368

NEWPORT NEWS

Vessel	Destination	Tons
Br. Lady Plymo'th	Taranto	6000
It. Tea	Genoa	7200
Am. Kanawha	Port au Spain	2956
Grk. Tsiropinas	Palermo	4500
Br. Penlee		5500
Br. Jersey City	Italian Port	7000
Br. Fairmount		2600

BALTIMORE

Vessel	Destination	Tons
Castlemoor	Egypt	4999
Luigi	Italy	4659
Rio Preto	Brazil	5142
Camilla	Panama	3123
Calimeris	Italy	5602
Harflete	Italy	6500
Roker	Egypt	5300
Polarstjernen	Sweden	5100
Gretaston	Spain	5069
Alf	Argentina	1300
Enterpe	France	5400

[1] Crozer - Pocahontas Coal Co.

[2] New River Coal Co.

LAKE MARKETS

PITTSBURGH

Market decidedly improved, with heavy line demand, and operations up to fully 60% of capacity. Free coal stronger and contract coal higher.

A much more cheerful tone pervades the Pittsburgh coal market. With the continued improvement in steel mill operations as well as some improvement at foundry and machine shops, the line demand is fully up to normal. The railroads are taking slightly increased quantities of coal. Lake shipments are as poor as formerly, and nothing better is now expected of the Lake trade than perhaps a slight spurt toward the close of the season.

The increased demand for coal is chiefly against contracts and the market for free coal has not improved materially, though prices lately quoted in these reports are now being adhered to very strictly. For contract coal the market is definitely stronger, there being practically no sellers at less than $1.15 for mine-run to Apr. 1, representing a total advance of fully 10c. per ton in the past 60 days in the case of contract.

Coal output has increased slightly in the past fortnight, and it is conservatively estimated that the Pittsburgh district is now operating at fully 60% of its capacity, some estimates being considerably higher than this.

The market for free coal is strong at the following figures: Slack, 50@60c.; nut and slack, 90@95c.; nut, 95c.@$1; mine-run, $1.@1.05; ¾-in., $1.10@1.15; 1¼-in., $1.20@1.25, per net ton at mine, Pittsburgh district. On contracts to Apr. 1 the market is firm as follows: Slack, 85@95c.; mine-run, $1.15; ¾-in., $1.25; 1¼-in., $1.35.

BUFFALO

Still a small improvement in bituminous, just enough to make the dealers anxious. One encouraging point is in better railroad activity. No increase in Canadian demand. Anthracite still quiet.

Bituminous—The movement increases week by week, but the volume is not yet very large. A good many business men are away for the summer which is delaying buying; they will buy coal when they return if the general conditions still improve and if not they will wait. There is complaint here and there of dullness but a quiet trade is the best, for it does not stimulate production unduly.

There is more buying on the part of the railroads than there was and this is expected to continue for some time; the roads have not had much of a supply for a long time and they will need more if they are to move the fall crops. Some of them are also anticipating labor troubles in the spring, though this is to early to buy for anything of that sort.

There is much report of the Canadian trade just going to settle down to a normal activity, but so far it has failed to do so. As it looks now the Canadian trade is not going to be of much consequence for the time being at least. The wheat crop there is large, but it is not stimulating business. There is not much coal on track here at present. Some of the worst delinquents in that line are reporting that their coal is all sold before it reaches here. Quotations remain on the basis of $2.70 for best Pittsburgh lump, $2.55 for three-quarter, $2.45 for mine-run and $2.25 for slack.

Anthracite—The consumer is not ready to buy yet. All reports agree that there is much less coal in the home bins than usual, but the consumer has an idea that he can get his supply the same day he orders it, even if he waits till late fall. Shippers anticipate a clamor then that has not been equaled lately. The mines have not increased their running schedules and will not do so till there is more buying. If the demand then exceeds the supplies there will have to be a large increase of storage capacity provided on the Upper-Lake docks.

The rail lines are not moving much coal and the lake docks are not as active as they were a year ago, which means that there will be a shortage when the season closes, in spite of the congestion at storage centers. Lake shipments for the week were 112,500 tons.

COLUMBUS

Fairly good demand for steam grades and prices well maintained. Domestic trade slow, due to the excessive rains. The tone of the market is only fair and future prospects are not bright.

The domestic demand has been rather sluggish in Columbus and central Ohio territory during the past week. The heavy rains have affected the trade both in cities and rural districts. Buying on the part of dealers is restricted because of fair stocks and they are loath to invest any more than is necessary. Rains in the country have prevented farmers from hauling their winter's supply of fuel. Threshing has been long drawn out and the amount of coal required is not as large as formerly. Retail trade is slow, though prices are well maintained.

Steam business is better as manufacturing appears to be on the up grade. Munitions factories especially are active and a considerable amount of coal is required to keep them running. As a result of the better demand contracts are being looked after more closely and there is not so much cheap fuel offered on the open market. Strength is shown in the small sizes as there is still a better demand than can be supplied by Ohio operators.

Lake trade is slow and not much improvement is expeced for the time being. The docks of the upper lake ports are still congested and the movement to the interior is slow. A large part of the tonnage going to the Northwest is from West Virginia mines.

There is still a good demand for anthracite in Columbus territory; the consumption is much larger than usual. Coke trade is also showing some signs of increased activity.

Prices in Ohio fields are as follows:

	Hocking	Pomeroy	Kanawha	Eastern Ohio
Rescreened lump	$1.45	$1.50		
Inch and a quarter	1.35	1.35	$1.30	$1.25
Three-quarter inch	1.25	1.25	1.25	....
Nut	1.15	1.25	1.15	....
Mine-run	1.05	1.10	1.05	1.00
Nut, pea and slack	65	.65	.65	.55
Coarse slack	55	55	.55	.45

Mines have been working at about the following percentages of full capacity:

	Week Ended					Week Ended			
District	July 31	Aug. 7	Aug. 14	Aug. 21	District	July 31	Aug. 7	Aug. 14	Aug. 21
Hocking	15	25	25	30	Cambridge	30	30	35	35
Jackson	20	20	20	20	Masillon	25	25	30	50
Pomeroy	35	25	40	40	Eastern O.	50	30	55	55
Crooksville	20	30	30	30					
					Average	29	30	33	34

CINCINNATI

Demand poor but a car shortage has helped to strengthen prices. Heavy domestic buying is expected to begin at any time.

Slightly better prices are noted in spite of the fact that buying is very light on both sides of the market. The improved strength is due to the shortage of cars, which was reported nearly every day. The retail trade is still holding off, and the domestic market, in consequence, remains extremely dull. Inasmuch as stocks are known to be low everywhere, however, it seems certain that buying for the usual winter demand must begin soon, and this should strengthen the market very materially. At the same time, it is also probable that an increased movement of the prepared grades will weaken the steam market, on account of the increased production of screenings. The general industrial situation is not improved, and the grave danger of European complications has not helped it any.

TOLEDO

Conditions improve at Toledo considerable coal going up the Lakes. Wet weather delays buying.

The improvement noted here for several weeks is holding. Hard coal is moving a little better and domestic business is expected to increase shortly. Smokeless coal, including the Pocahontas variety is not holding as firm as was expected and there is some shading of prices in order to secure business. Lake shipments continue but are by no means as heavy as usual for this season of the year. Steam coal continues rather weak, although factories are beginning to run better and it is expected that the first of the year will find many of the factories again contracting.

CLEVELAND

The market has been dragging for more than a week. Stocks large. Lake business begins to show signs of improvement.

All last week there was an excessive supply at this point; companies that have not paid car service for several weeks were caught last week. With 400 cars at the opening of last week the market was not cleaned up by Saturday night and 300 cars arrived over Sunday. Monday night about 160 cars of coal were on track unsold. Prices were maintained in spite of the large amount of spot coal, but this was due principally to the fact that there was no one to accept the coal even at a cut.

The Lake business is beginning to improve. Some shippers who own boats have enough coal to load all their ships due here this week. This is unusual as none of the fleets have had a full tonnage of coal in any week since spring. All of the ships that were at dock have been fitted out or are now being fitted out. Two ships left Lorain last week with cargoes of coal loaded last winter.

The real excitement on the lakes is the large tonnage of ore handled during the last thirty days. Not since 1907 has so much ore been offered to the ships the last half of the season. Shippers Monday sought out the ship managers to give ore contracts but few of these fleet operators can carry any more ore than is now under contract.

Though the Lake coal traffic has been dull this season, there is reason to believe it will be practically normal the rest of the year. Stocks in the Northwest are small although the upper lake docks are full. The movement to the interior is growing larger and as the dealers must stock against a miners strike next spring, there will be a larger movement to the interior than has been predicted.

Quotations for shipment to jobbers are as follows:

	Pocahontas	Youghiogheny	Fairmount	Bergholz	Ohio No. 8
Lump	$3.70			$2.30	
Lump, 6-in.				2.30	
Lump, 1¼-in.				2.10	$2.10@2.15
Lump, ¾-in.		$2.15@2.20	$2.00	2.00	2.00
Egg	3.70			1.95	
Mine run	2.70	2.10@2.15	1.90	1.85	1.80@1.85
Slack		1.55	1.70	1.50	1.50

DETROIT

Quantity of consignment coal much reduced and the market steadier. Stocking by consumers considerably less than normal.

Local manufacturing establishments and retail yards have made little apparent effort to stock up for future requirements. Until about two weeks ago steam and domestic coal was being shipped into the local market in such quantities that large amounts of both remained on railroad tracks coming to forced sale at prices which unsettled the market in all lines. The steam users, by buying judiciously have been able to supply their requirements whenever the necessity arose at low figures. The quantity of consignment coal arriving is not excessive now and a steadier trend has developed in prices. The steam coal users are now buying in small lots, evidently hopeful that new opportunities will arise to get cheap coal. Shippers find encouragement, however in the fact that the small orders are numerous.

Neither domestic sizes nor anthracite are being bought liberally. Retail dealers say their customers are doing very little in the way of putting in winter supplies and that they do not care to accumulate excessive stocks. In the Lake trade, freighters carrying down iron ore and grain are making the upbound trip from Lake Erie ports without cargo, more often than with coal. The sluggish conditions in the Lake trade is the result of the delayed movement from the head of the lakes.

LOUISVILLE

Better movement but not much change in prices. Some increased demand from cotton mills.

A better movement of Kentucky coal is noted though this is not accompanied by much, if any, stiffening in prices. As has been the case for several weeks, however, there is said to be more coal moving at the higher price levels. The present movement is due to the retailers trying to get their supplies in before the large movement begins next month; at least the operators hope it will develop, though heretofore this year all signs have generally failed.

Inclement and abnormal weather has limited the farmers' stocking movement which was getting under way. The steam coals are somewhat quicker, the Southern cotton seed mills being in the market for a considerable volume. Prices are not much, if at all changed, the block coals for the most part ranging from $1.25 to $1.50, with the especially fancy coals from $1.80 to $1.90, and the bulk of the best nut and slack going at from 50 to 55 cents, all prices f.o.b. mines.

COKE

CONNELLSVILLE

Furnace coke still dull and inactive but with hopes of better prices later in the year. Foundry coke demand improved further. Production and shipments slightly increased.

The furnace coke market seems to be under less pressure from surplus coke, but prompt is still available at $1.50 in limited tonnages at least. Shipments have increased on several contracts, in cases in which the furnace interests recently asked for a curtailment on account of the stacks working badly and not requiring their normal tonnages, but in several instances contract shipments are still below the normal. There is scarcely any inquiry for furnace coke for shipments over the remainder of the year. Some inquiry has developed for the first six months of next year but so far as known the operators have refused to quote for that delivery. They still seem to expect that however unsatisfactory the market has been in recent weeks there will be a firming up before the end of the year.

Foundry coke demand has increased still more. There is heavier buying of prompt lots and shipments on regular contracts have been increased in many cases. Shenango Furnace No. 4 at Sharpsville has just gotten into blast, using coke produced at its own works in the Ligonier district. Claire and Fannie, in the Shenango Valley, are expected to blow in shortly. The market is quotable as follows: Prompt furnace, $1.50@1.55; contract to Oct. 1, $1.65@1.70; contract to Jan. 1, $1.85@2; prompt foundry, $2.25@2.60; contract foundry, $2.30@2.60, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Aug. 14 at 374,413 tons, an increase of 7573 tons, and shipments at 378,865 tons, an increase of 9140 tons.

Buffalo—There is not much change in the situation. Some shippers are not very enthusiastic over the outlook; they say that the reports are hardly borne out by the actual improvement. While the trade is more active than it was in the spring the prices are not much higher. At present the quoted price is on the basis of $4.25 for best Connellsville foundry and $3.30 for stock coke.

Chicago—The metallurgical coke market seems to have hardened somewhat because of the steadily increasing demand. Byproduct sizes have gone forward in increasing volume. Quotations are as follows: Byproduct foundry, $4.85@5.10; byproduct domestic, $4.60@4.75; Connellsville, $4.75@4.85; Wise County, $4.75@4.85; gas coke, $3.75@3.90.

MIDDLE WESTERN

GENERAL REVIEW

Market shows some strengthening in spots. Rate decisions cause a general hesitancy. Screenings steady. Some betterment in anthracite buying.

The situation shows no backward tendencies and has some encouraging aspects. There is more booking of small orders at fair prices, which in the aggregate amount to a considerable tonnage. Retail buying is gaining more momentum, and there is a broader market for steam coals. The buying is less spotty and the trend slowly upward.

Domestic sizes have moved in moderately increasing volume. The decline in screenings seems to have stopped, and they have hardened somewhat during the past week, selling on an average of 70c. to 75c. Business conditions in the Northwestern markets are improving; the crops of this section are showing substantially better than an average yield, and the depression in that territory seems to be about over. The demand from Northwestern interior points shows a steady increase, and there should be a stronger call for bituminous coal for threshing and domestic uses very shortly.

Lake trade is slow, and there seems to be no hope of improvement in the immediate future. Congestion on the docks of Upper Lake ports is still reported, and movement of dock coal to interior points is very slow. In the Middle West farmers do not seem to be buying coal as readily as in former years. This may be due to the excessive rainfall which has delayed their work and prevented them from hauling their usual supply of winter fuel. Some of the larger railroad systems are stocking up to guard against emergencies. Outside of Kentucky production, there is less cheap coal offered at the present time than ever before, and although the average running time of all mines is still only a little over three days per week, prices are well maintained.

CHICAGO

Price advances announced for Sept. 1 stimulate some month-end buying. Threshing demand has been disappointing. Eastern coals heavier. Anthracite moving better.

Franklin County domestic lump prices have ranged from $1.35 to $1.60 during the week, but it is said that most shipments have been going forward at around $1.40, and very few at the circular of $1.60. The demand is steady, and egg and nut have been moving a little better for the last few days. It is expected that an advance of 10c. a ton will be announced Sept. 1 on domestic sizes. Carterville domestic lump is in steady demand at as high as $1.60, and No. 1 washed has been strong at $1.65. Williamson County prepared sizes are moving forward at around $1.50, and the demand has bettered slightly.

Railroad shipments from the Springfield district have increased slightly during the past week. The decline in screenings has ceased and the forwarding of domestic sizes has slightly improved.

Some improvement is apparent in the demand for Indiana coals. The retailers are beginning to buy domestic sizes for early fall trade. Domestic shipments for threshing trade are about over and the volume of this business was much less than in previous years. Steam coals seem to be picking up due to more activity in the iron and steel industries. Screenings have been in fairly good demand.

Knox County operators have been shipping more steam coal than anything else, and as a consequence mine-run and screenings have been stronger than domestic sizes; screenings have been selling as high as 85c. and 90c.

Sullivan County mines have been working close to three days this week. Clinton County mines are producing mainly steam coal, and the call for domestic sizes is very slow. Screenings are a little stronger.

An easing off has occurred in the demand for Pocahontas and New River prepared sizes. A record-breaking business was done in July both in prices and tonnage, but the Western territory did not respond to present efforts to stimulate shipments. Orders were large toward the end of the month in anticipation of the price advance on Sept. 1. Splint is improving. Nut and slack is in good demand, while mine-run is very weak. There seems to be little free nut and slack on the market. Some jobbers during the last week have forced lower quotations on spot business, but there is still firmness shown in the prices quoted by standard operators for free coal.

The Kentucky situation is slightly better, but there is still plenty of free coal sacrificed at low prices.

Anthracite as a whole has been moving in better volume. The country business has improved, dealers showing more of a disposition to take the coal they ordered earlier.

Quotations in the Chicago market are as follows:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump	$1.40@1.60	$1.25@1.50	$1.35@1.50	$1.25@1.35	$1.40@1.50
Steam lump	....	1.20@1.35	1.15@1.35	1.15@1.25	....
2½ and 3-in. lump	....	....	1.25@1.35	....	1.30@1.40
1¼-in. lump	....	....	1.20@1.25	1.15@1.25	....
Egg	1.35@1.60	1.25@1.50	1.15@1.25	1.10@1.25	1.15@1.25
Nut	....	1.15@1.35	1.00@1.10	1.00@1.10	1.00@1.10
No.1washed	1.35@1.60	....	1.50	....	....
No.2washed	1.35@1.45	....	1.40	....	....
No. 1 nut	1.45@1.60	....	....	....	....
No. 2 nut	1.30@1.40	....	....	....	....
Mine-run	1.10	1.00@1.05	.85@1.00	.90@1.00	.85@1.05
Screenings	.75@ .80	.65@ .75	.65@ .75	.65@ .80	.75@ .85

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.35@1.50	$1.35@1 90	$2.10@2.25	$2.00@2.25	$1.40@1.60
1¼-in. lump	1.25@1.35	1.15@1.35	....	....	....
Egg	1.35@1.50	1.15@1.35	2.00@2.25	1.70@2.25	1.35@1.50
Nut	....	1.00@1.10	....	1.65@1.75	....
No. 1 nut	1.35@1.50	....	....	....	....
No. 2 nut	1.25@1.35	....	....	....	....
Mine-run	1.00@1.10	.85@1.10	1.25@1.40	1.25	1.00@1.10
Screenings	.70@ .75	.50@ .75	....	....	....

West Virginia splint, 1¼ lump, $1.25 3- to 4-in. lump, $1.35.

Lake Receipts—Receipts by Lake for the week ended Aug. 24 and for the season, this year and last year, were as follows:

	1915		1914	
	Hard	Soft	Hard	Soft
Buffalo	19,797	......	11,432	......
Oswego	4,535	......	6,795	......
Toledo	......	11,156	......	10,904
Sandusky	......	10,500	......	......
Cleveland	......	6,548	......	2,900
Ashtabula	......	......	7,000	9,264
	24,332	28,204	25,227	23,068
August total	71,612	113,460	115,803	79,167
Season total	451,011	340,700	417,515	415,475

INDIANAPOLIS

Seasonable improvement in the volume of trade, especially in domestic lump. Screenings in good demand at top prices of the season. Retailers pushing sales, anticipating foreign demand.

The Indiana coal situation shows the usual improvement over summer conditions, due to the approach of fall though the increase is not large. In past years it has been customary for retailers to make their first price advances in September and this usually stimulates buying of domestic grades in August. In other departments the improvement is caused by the opening of plants that pack tomatoes, corn, beans, etc.

The wet weather has prolonged the threshing season and so the demand for lump continues from that direction. Slack is still moving well at the recent better prices, 70 to 80c. for Nos. 5 and 6 and 85 and 90c. for No. 4. Some of the large operators are temporarily out of the market, having covered their output.

ST. LOUIS

Movement light and demand below normal for this period. Full winter circular in effect Sept. 1.

The market the past week has been listless and the movement light. There has not been the improvement in the demand that the middle of August usually brings. Prices are gradually advancing on lump and egg. By Sept. 1, when the full winter circular will be restored, the situation should begin to improve. However, dealers are said to be fairly stocked and not much change is expected until the consuming public begins to call for heavier deliveries.

Prices are as follows:

	Wilm. & Frnk. Co.	Sparta	Mt. Olive	Standard
6-in. lump	$1.35@1.50	$1.20	$1.50	$1.00
2-in. lump	....	1.10	1.35	.90
3-in. lump	....	....	1.35	....
3x6 egg	1.35@1.50	....	....	.90
No. 1 nut	1.25	....	....	....
No. 2 nut	1.10@1.15	....	....	.75
No. 1 washed	1.65	....	1.50	....
No. 2 washed	1.35	....	....	....
No. 3 washed	1.25	....	....	....
No. 4 washed	1.20	....	....	....
No. 5 washed	.80	....	....	....
Screenings	.55	.55@ .60	....	.55

KANSAS CITY

There has been very little change in the prices in Kansas City in either the retail or the wholesale market during the past month. There has been a slight decrease of a few cents in some grades with the market running very slow. The companies believe that the prices are due to increase next week and are looking forward to the beginning of a better business then.

PRODUCTION AND TRANSPORTATION STATISTICS

PENNSYLVANIA RAILROAD

The following is a statement of shipments over the P. R.R. Co.'s lines east of Pittsburgh and Erie for July of the current year and the seven months of 1914 and 1915, in short tons:

	July		Seven Months	
	1915	1914	1915	1914
Anthracite	653,020	693,545	6,076,487	6,347,822
Bituminous	3,668,146	3,966,357	23,929,923	27,521,539
Coke	1,091,344	847,135	6,090,263	6,075,020
Total	5,412,510	5,507,037	36,096,673	39,944,381

EXPORTS

The June coal exports by districts and states were as follows:

	Anthracite	Bituminous	Coke
Maine and New Hampshire	1,613	1	......
Maryland	......	305,917	8,010
Massachusetts	52	......	......
New York	20,685	4,201	644
Philadelphia	5,387	121,379	61
Porto Rico	......	60	......
Virginia	85	608,599	6,642
Mobile	20	290	......
New Orleans	......	769	......
Arizona	......	1,130	6,483
El·Paso	......	13,925	1,211
Laredo	......	3,846	......
San Francisco	......	31	......
Southern California	1	24	......
Washington	......	179	4,872
Buffalo	109,658	124,367	32,600
Dakota	795	2,082	154
Duluth and Superior	20	1,850	27
Michigan	......	27,597	6,299
Ohio	10,058	630,970	398
Rochester	117,272	64,361	221
St. Lawrence	85,680	21,723	903
Vermont	1,310	109	103
Total	352,636	1,933,410	68,628

BUNKER COAL

Districts	June
Maryland	76,850
New York	318,589
Philadelphia	46,574
Virginia	159,155

BALTIMORE & OHIO

The following is a statement of coal and coke tonnage moved over this system and affiliated lines during July and the previous two months:

	May		June		July	
	1915	1914	1915	1914	1915	1914
Coal	2,564,481	2,357,119	2,883,959	2,380,795	2,887,918	2,594,407
Coke	297,897	301,163	329,130	298,237	344,557	255,650
Total	2,836,287	2,658,282	3,213,089	2,679,023	3,232,475	2,850,057

MIDDLE WESTERN ROADS

The following is a comparative statement of the coal handled over the 17 principal Middle Western railroads for the first six months of this year, as compared with the same period last year:

	January		February		March		April		May		June		Total 6 Months	
	1914	1915	1914	1915	1914	1915	1914	1915	1914	1915	1914	1915	1914	1915
Ill. Cent. R.R.......	783,936	816,349	782,302	592,875	868,612	651,454	157,535	432,885	352,263	472,450	461,701	480,490	3,406,349	3,446,503
C. & E. T. R.R.....	766,318	740,667	775,064	499,986	914,980	530,388	133,711	361,925	311,614	319,925	398,439	370,284	3,300,126	2,823,175
C. B. & Q. R.R.....	625,906	708,755	612,220	412.527	693,210	408,677	114,397	284,944	230,430	272,709	291,275	350,527	2,567,438	2,438,139
C.C.C. & St. L. Ry.	546,543	534,387	515,567	423,891	469,601	439,458	178,201	326,255	253,927	307,498	279,470	332,940	2,243,309	2,364,429
Vandalia R.R.......	491,946	524,917	344,764	401,306	602,728	426,860	81,325	351,917	217,068	343,055	332,467	326,268	2,070,298	2,374,323
C. T. H. & S.E. Ry	285,093	339,280	329,683	256,020	409,016	277,246	79,404	225,851	174,494	195,400	205,572	203,071	1,483,262	1,496,868
C. & A. Ry.........	173,304	212,523	177,446	147,918	205,504	160,556	106,004	129,996	54,154	119,661	110,256	138,619	826,668	909,273
Wabash R.R........	156,844	179,512	171,154	138,198	191,277	148,585	18,653	98,584	50,359	89,791	81,317	100,412	669,604	755,082
St.L. & I.M. & S.Ry.	165,505	153,484	138,159	109,308	189,654	126,732	33,823	98,829	64,030	96,173	111,699	116,806	702,870	701,382
Southern Ry........	180,779	111,483	166,949	82,680	207,430	97,474	59,104	78,515	85,537	84,078	101,327	77,396	801,126	531,626
B. & O. S. W. R.R...	81,971	114,041	89,210	93,968	125,722	99,421	13,026	61,355	29,804	47,498	36,985	57,191	376,718	473,474
St. L. T. & E. R.R...	41,155	65,385	60,314	46,985	75,524	63,360	41,792	36,207	39,369	43,493	48,369	35,572	306,523	291,002
St. L. & O. F. Ry...	50,285	73,347	50,244	47,409	80,264	56,440	8,529	38,906	14,528	38,296	44,160	47,580	248,010	301,978
L. & M. Ry.........	53,498	72,215	65,592	48,711	59,422	58,118	19,175	26,471	17,299	19,502	15,975	17,596	230,961	242,613
C. I. & L. Ry......	65,606	41,828	65,327	44,788	83,713	58,835	10,582	48,392	31,200	58,042	36,062	61,332	292,490	313,217
C. P. & St. L. Ry...	48,877	51,072	51,661	34,066	44,975	38,798	7,962	28,077	12,521	25,165	9,911	26,414	175,907	203,592
C. & N. W. Ry.....	38,462	47,540	38,612	37,186	43,271	34,425	7,111	27,764	13,764	26,986	15,071	31,787	156,291	205,688

NORFOLK & WESTERN

Destination of shipments over this road for **July of this** year, the seven months of this year and last year were as follows, in short tons:

	July		Seven Months	
Coal	1914	1915	1914	1915
Tidewater, foreign.......	140,848	516,709	1,062,893	2,184,984
Tidewater, coastwise.....	279,708	281,739	2,241,934	1,887,920
Domestic...............	2,082,506	2,088,703	11,714,556	11,575,400
Coke				
Tidewater, foreign.......	182	552	197	16,688
Domestic...............	88,325	73,434	668,978	501,592
Total...............	2,591,569	2,961,137	15,688,558	16,166,584

Distribution of shipments for the month of June follows:

	Shipped	Tipple	Total	Coke
Pocahontas.............	1,375,303	11,153	1,386,456	66,095
Tug River..............	348,737	2,370	351,107	....
Thacker................	209,216	6,713	215,929	....
Kenova.................	81,794	8,643	90,437	....
Total...............	2,015,050	28,879	2,043,929	66,095

CHESAPEAKE & OHIO RY.

The following is a comparative statement of the coal and coke traffic from the New River, Kanawha and Kentucky districts for June and the twelve months of the fiscal years 1914 and 1915, in short tons:

	June				Twelve Months			
Destination	1915	%	1914	%	1915	%	1914	%
Tidewater.....	414,428	21	322,008	18	3,882,443	18	3,560,350	19
East..........	140,413	7	172,686	10	2,352,457	11	2,561,809	14
West..........	1,284,398	63	1,192,911	65	13,627,870	65	11,554,335	61
Total.......	1,839,239		1,687,605		19,862,770		17,676,494	
From Connections								
Tidewater.....					187			
Bituminous....	185,400	9	135,357	7	1,246,576	6	1,169,979	6
Anthra. (local).	229				980			
Anthracite.....	1,129		1,669		14,308		16,263	
Total.........	2,025,997	100	1,824,631	100	21,124,821	100	18,862,736	100
Coke..........	22,701		29,392		200,921		388,752	

I, C. C. DECISIONS

Investigation and suspension docket No. 344—Coal rates from Oak Hills, Colo.

This proceeding is supplementary to that reported in 30 I. C. C., 505. The carriers having published the joint rates therein fixed by the Commission failed to agree upon the divisions thereof. The initial line thereupon petitioned the Commission to make an order prescribing the just and reasonable divisions of such joint rates to be received by each carrier party thereto. Divisions prescribed.

Investigation and Suspension Docket No. 458—Anthracite coal rates to Chicago, Ill., and other points.

Following "Rates for Transportation of Anthracite Coal," 35 I. C. C., 220, the proposed increase of 25c. per gross ton on anthracite coal, "prepared sizes," from Pennsylvania mines to Chicago, Ill.; to points taking Chicago rates; to connecting points between eastern and western lines near Chicago, such as Joliet and Kankakee; and to the other connecting points, Peoria, East St. Louis, and St. Louis, justified.

Investigation and Suspension Docket No. 569—Bituminous coal and coke rates from mines and ovens in Alabama, Illinois, Kentucky, and Tennessee to Mississippi River crossings and various junction points in Tennessee, Mississippi, and Louisiana.

1. Proposed increased rates on coal to New Orleans, La., Memphis, Tenn., Greenville, Natchez, and Gulfport, Miss., Baton Rouge, La., and certain other points in Mississippi and Louisiana justified.

2. Proposed increased rates on coal to Jackson, Vicksburg, Newton, and certain other points in Mississippi and Tennessee not justified. Increased rates to Vicksburg from Illinois and Kentucky justified.

3. Certain increases as shown herein to Meridian and other Mississippi points, and to Jackson, Milan, and other points in Tennessee, justified.

4. Increased rates on coke to Mississippi Valley points justified.

FOREIGN MARKETS

GREAT BRITAIN

Aug. 13—The coal industry is still hampered to a great extent by the Price of Coal (Limitation) Act and the licensing regulations. The latter, it will be remembered, apply to allied as well as neutral countries on and after today (August 13), and it will probably be some little time before the trade adjusts itself to the restrictions now imposed upon it. For the moment the amount of new business passing is not large, either in the inland or the shipping branches of the industry. The Board of Trade returns show that our exports of coal, coke and patent fuel last month were no more than 3,732,000 tons, as compared with 7,275,000 tons in July, 1913; but the total value has not fallen off proportionately, for the average value per ton last month was $4.18, whereas in July last year it was only $3.26. At the same time, our receipts from the export trade were only 22 millions sterling in the seven months now completed of this year, as compared with 31 millions in the corresponding period of 1913. The bunkering business has also fallen off during the same period from 12 million to 8,500,000 tons.—"The Iron & Coal Trades Review."

Exports—British exports for July and the first seven months of the past three years were as follows:

	July			Seven Months		
To	1913	1914	1915	1913	1914	1915
Russia.....	880,066	870,385	10,152	3,024,394	2,880,174	29,572
Sweden....	402,713	423,349	131,382	2,501,362	2,223,442	1,759,450
Norway....	180,898	172,368	243,107	1,358,801	1,419,869	1,602,402
Denmark...	227,245	228,900	373,192	1,688,746	1,618,451	1,910,432
Germany...	867,036	922,088	....	5,152,017	5,124,739	....
Netherlands	194,047	143,249	179,653	1,221,128	1,015,775	941,862
Belgium....	162,492	127,892	....	1,234,054	1,008,258	....
France.....	1,161,473	1,090,169	1,533,713	7,580,543	7,908,294	9,994,471
Portugal[1]...	114,952	107,931	86,087	833,360	758,280	619,539
Spain[4].....	304,505	301,918	187,246	2,214,657	2,058,599	1,233,277
Italy.......	965,225	881,721	356,676	5,673,413	5,414,798	3,425,050
Aus. Hung..	103,976	84,596	....	678,360	546,760	....
Greece.....	72,022	66,999	43,890	395,080	441,131	263,379
Roumania..	25,987	47,061	....	96,131	203,781	......
Turkey.....	36,869	66.674	....	108,666	375,981	6,557
Algeria.....	97,581	101,719	53,010	768,982	712,247	578,505
Portuguese[5]	18,937	2,456	23,552	158,068	100,449	136,336
Chile......	44,626	32,426	343	409,398	334,631	35,773
Brazil......	153,575	130,979	18,632	1,175,349	858,107	359,902
Uruguay...	70,815	31,945	7,022	430,494	422,553	211,114
Argentine..	360,119	285,422	68,344	2,167,420	2,111,362	1,026,416
Channel Is..	20,729	19,101	11,505	91,320	95,954	72,622
Gibraltar...	22,923	28,586	12,260	210,690	199,215	202,326
Malta......	54,319	35,317	13,061	430,820	277,974	99,337
Egypt[2].....	290,891	262,224	118,177	1,804,202	1,899,066	803,973
Aden[3]......	14,229	11,156	16,515	87,064	96,725	105,794
India......	1,379	5,591	5,915	106,948	116,393	18,075
Ceylon.....	14,032	27,141	6,740	141,720	199,836	38,730
Miscell'ous.	111,550	90,118	38,843	758,205	763,575	396,813
Coke.......	99,605	107,954	66,935	599,275	625,563	486,644
Briquettes..	200,814	210,418	125,880	1,223,046	1,254,778	750,755
Total....	7,375,630	6,917,853	3,731,932	44,323,767	43,066,760	27,109,106
Bunker....	1,883,676	1,919,433	1,098,877	11,970,713	12,101,590	8,499,198

[1] Includes Azores and Madeira. [2] Including Anglo-Egyptian Sudan. [3] And dependencies. [4] And Canaries. [5] West Africa.

Note—The figures in the above table do not include Admiralty and certain other shipments.

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

For the official advertisements of bids wanted see the Contracts-to-Be-Let Section on Page 12.

✚Indicates contracts regarding which official information has been received.

Recast

In the following table we give a list of all old contracts coming up for consideration during the ensuing week. The table gives our contract number, the name of the purchaser, city, tonnage and page on which the detail notice appeared.

No.	Purchaser	City	State	Tonnage	Page
1134	Board of Education	Butte	Mont.	3,000[1]	198
1135	Louisville Provision Co.	Louisville	Ky.	2,400b	198
1160	Park View Hotel	Kansas City	Mo.	200a	199
1161	Board of Education	Colorado Springs	Colo.	3,000b	199
1168	Kan. City Vet. Col.	Kansas City	Mo.	100a	243
1169	F. G. Kinney & Co.	Kansas City	Kan.	500b	243
1170	Starks Realty Co.	Louisville	Ky.	1,100	243
1171	Municipal Light Dept.	Independence	Mo.	2 (cars)[2]	243
1172	Aud. Wall Paper Mills	Chicago	Ill.	1 (car)[3]	243
1173	Peet Bros. Soap Co.	Kansas City	Kan.		243
1174	Board of Education	Canton	Ohio	2,800b	243
1175	Amer. Radiator Co.	Kansas City	Mo.	12 (cars)	243
1177	Keeley Institute	Kansas City	Mo.	100b	243
1179	Kan. City Terminal Co.	Kansas City	Mo.	100b	243
1180	Water & Light Dept.	Columbia	Mo.	8,000b	244
1181	Prior Brass Mfg. Co.	Kansas City	Mo.		244
1182	Cupples Sta. L., H. & P. Co.	St. Louis	Mo.	25,000b	244
1203	Com. of Fisheries	Washington	D. C.	825a	244
1204	Com. of Adams County	Ritzville	Wash.		244
1205	Board of Education	Uhrichsville	Ohio		244
1209	Richland County Com.	Wahpeton	N. D.	300b	244
1262	Independent Sch. Dis.	Des Moines	Iowa		324
1268	Kidder County B. of Com.	Steele	N. D.	140b	324
1273	Starks Realty Co.	Louisville	Ky.	50	324
1279	County Government	Jamestown	N. D.	150b 20a	324
1284	Free Public Library	Council Bluffs	Iowa		324
1298	Local School Board	Hannaford	N. D.	45b	324

a Indicates anthracite coal. b Indicates bituminous. [1] Per year. [2] Per month. [3] Per week.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

1090—Columbus, Ohio—Bids on this contract (p. 117), which provides for furnishing the Public Service Department with coal have been received as follow: SCIOTO RIVER pumping station, approximately 3500 tons. Elk Coal Co., Columbus, Hocking mine-run $1.44, Cambridge mine-run, $1.46, West Virginia mine-run, $1.42; New York Coal Co., Columbus, Hocking mine-run, $1.60; Fletcher-William Co., Columbus, West Virginia mine-run, $1.45; Gem Coal Co., Nelsonville, Hocking mine-run, $1.53; Victoria Coal Co., Columbus, Hocking mine-run, $1.48. MUNICIPAL LIGHT plant, 10,000 tons. Victoria Coal Co., Columbus, Hocking nut, pea and slack, $1.19; Fletcher-Williams Co., West Virginia nut, pea and slack, $1.12. GARBAGE REDUCTION plant, 3000 tons. Fletcher-Williams Co., Columbus, Hocking nut, pea and slack, $1.19½, West Virginia nut, pea and slack, $1.12; Victoria Coal Co., Columbus, Hocking nut, pea and slack, $1.19. City hall, Schiller Park, water-works shop, State St. yard, Goodale Park and the Recreation department, approximately 1000 tons delivered. Franklin Builders' Supply Co., Columbus, various bids of $2.29; $2.05,; $2.60 and $2.10 for Hocking lump; J. Rapp & Co., Columbus, Hocking lump, $2.30 for all places; M. A. Suydam & Co., Columbus, $2.17½ for all places, forked lump. This is the second opening of bids on this contract. All former proposals being rejected because of the reduction of 15c. on the freight rate from the Hocking Valley field which would affect the delivered price. There was some reduction in the bids as a result. The contract will be awarded within a short time. Address Clk. Paul B. Kemper, Public Service Comr., Columbus, Ohio.

1249—Ellwood City, Penn.—Bids will be received on this contract (p. 284), which provides for furnishing the fuel requirements of the local Board of Education until 8 p.m., Sept. 7. Address Secy. W. J. Moore, Bd. of Edu., Ellwood City, Penn.

✚1174—Canton, Ohio—Bids on this contract (p. 243), which provides for furnishing the local Board of Education with coal during the ensuing year will be received until noon, Aug. 23. Bids are requested on Pittsburgh No. 8 three-quarter coal or its equal. All bids must be accompanied by a certified check for $100. Address Clk. W. C. Lane, Bd. of Edu., High School Bldg., Canton, Ohio.

✚1176—Topeka, Kan.—The tonnages involved in this contract (p. 243), which provides for furnishing the local Board of Education with coal during the ensuing year, are as follows: 200 tons of lump; 200 tons of slack; 2000 tons of nut coal. Bids will be received until 5 p.m., Aug. 31. Address Clk. M. C. Holman, Bd. of Edu., Topeka, Kan.

New Business

✚1301—Pewee Valley, Ky.—The Confederate Home has advertised for bids for its winter supply of coal delivered at the home. Proposals on mine-run, lump and nut are required. Address Commandant Henry George, Pewee Valley, Ky.

✚1302—Wilbur, Wash.—School District No. 59, at this place will receive sealed bids until Sept. 1, for furnishing 75 tons of steam coal to be delivered to the high school building. Address Clk. H. E. Jones, School Dist. 59, Wilbur, Wash.

✚1303—Johnstown, Penn.—The Borough of Oakhurst will receive bids until 7:30 p.m., for furnishing a good quality of mine-run coal as may be required during the ensuing year. Address Secy. J. P. Orner, Oakhurst, Johnstown, Penn.

✚1304—Jackson, Ohio—The Lick Township Board of Education will receive bids until noon, Aug. 28, for furnishing and delivering coal to the various school buildings during the ensuing year as may be required. Address Clk. R. K. Schellenger, Bd. of Edu. Lick Township, Jackson, Ohio.

✚1305—Hubbard, Ohio—The Board of Education at this place will receive bids until noon, Sept. 3, for furnishing 1¼-in. screened coal delivered in the basement of the school building, as may be required during the ensuing year. Address Clk. Clyde Smith, Bd. of Edu., Hubbard Village School Dist., Hubbard, Ohio.

✚1306—Billings, Mont.—Bids will be received by School District No. 2, until 4 p.m., Sept. 2, for furnishing the coal as may be required during the ensuing year. Bids may be submitted f.o.b. cars at Billings or delivered to the school buildings. Proposals are also requested for delivery alone. Address Clk. A. J. Thorine, School Dist. No. 2, Yellowstone County, Billings, Mont.

✚1307—St. Louis, Mo.—Sealed bids were received until noon, Aug. 23, for furnishing the Water Department with approximately 37,000 tons of egg coal and 3400 tons of screenings to be delivered during the ensuing year. All bids were to be accompanied by a certified check for $500 and the successful bidder will be required to furnish a bond for not less than $5000, guaranteeing the satisfactory performance of the contract. The contract is to become effective Sept. 1, and will expire July 31 of next year. Address Supply Comr. Joseph B. Thomas, City Hall, St. Louis, Mo.

✚1308—Shoals, Ind.—The commissioners of Martin County will receive bids until 10 p.m., Sept. 1, for furnishing coal as may be required at the County Court House and jail during the ensuing year. Address Audr. L. D. Haga, Bd. of Comrs., Shoals, Ind.

✚1309—Cedar Rapids, Iowa—Sealed proposals were received until 10 a.m., Aug. 27, for furnishing the local City Government with approximately 300 tons of bituminous lump and 50 tons of anthracite coal. Address City Clk. L. J. Storey, Cedar Rapids, Iowa.

✚1310—Sidney, Ohio—Sealed proposals were received until Aug. 7, for furnishing the coal required at the local Water Works during the year beginning Sept. 1. Address Dir. C. B Deweese, Sidney, Ohio.

✚1311—Cheney, Wash.—The State Normal School at this place will soon advertise for coal to be supplied during the ensuing year. Address Superintendent, State Normal School, Cheney, Wash.

✚1312—Montevideo, Minn.—The County Board of Chippewa County received bids until 2 p.m., Aug. 20, for furnishing and delivering coal as required during the coming year. Bids are requested on Youghiogheny coal. Address County Audr. J. J. Stennes, Montevideo, Minn.

1313—Boston, Mass.—The Boston & Maine R.R. asks for bids on water transportation, on the coal delivered f.o.b. loading pier, and for coal delivered alongside Mystic Wharf, Boston, each for a period of one year from the dates of expiration of present charters and coal contract and for a period of five years from the dates. For previous purchase by this road see Contract 172, Vol. 7, p. 399. It is explained that the railroad now has a charter for a 7500-ton steamer carrying coal from Hampton Roads and Baltimore which expires Aug. 29, 1916, another charter expiring Oct. 31, 1917 and a contract for approximately 720,000 tons per year of locomotive bituminous coal which expires Apr. 1, 1917. Bids are asked at this time "in order to determine the most advantageous terms in contracts and charters to cover this business at the expiration of the present contracts. Bidders are asked to submit proposals on forms, in outline as follows: Schedule A: Steamer charter for one year and for five years starting Sept. 1, 1916. Schedule B: Steamer charter for one year and for five years starting Nov. 1, 1917. Schedule C: Contract for approximately 720,000 gross tons of bituminous, to be delivered on steamer at loading pier in one year commencing Apr. 1, 1917. Schedule D: Contract for approximately 720,000 gross tons of bituminous, to be delivered alongside Mystic Wharf, Boston, in one year commencing Apr. 1, 1917. Schedule E: Contract for approximately 3,600,000 gross tons of coal f.o.b loading pier, to be delivered in five years. Schedule F: Contract for approximately 3,600,000 gross tons of coal alongside Mystic Wharf, to be delivered in five years. All bids must be in by Sept. 10. Address B. S. Hinckley, Boston & Maine R.R., Boston, Mass.

✚1314—Wellston, Ohio—The Board of Education received bids until noon, Aug. 21, for furnishing and delivering No. 2 and No. 4 lump coal as may be required to the various school buildings during the ensuing year. Address Clk. C. L. King, Bd. of Edu., Wellston City, Ohio.

✚1315—Keytesville, Mo.—The County Court will receive bids until Aug. 30 for furnishing the local Court House and jail with Illinois coal, to be delivered before Nov. 1. Address County Clk. W. W. White, Keytesville, Mo.

1316—Minot, N. D.—Sealed bids were received by the School Board of Dist. No. 128 for furnishing coal for the Consolidated Schools during the ensuing year. Bids were received until Aug. 21. Address Clk. Thomas R. Drady, Burt School Dist., Minot, N. D.

✚1317—Hutchinson, Minn.—The Board of Education for Dist. No. 2 received bids until 8 p.m., Aug. 23, for furnishing 250 tons of Youghiogheny lump coal delivered at the local schools. All bidders were required to designate the heat value of the coal they propose furnishing. Address Secy. Henry Braun, Bd. of Edu., Dist. No. 2, Hutchinson, Minn.

✚1318—Carthage, Mo.—Bids will be received by Jasper County until Sept. 1 for furnishing the best quality deep shaft, lump, mine-run, nut and slack coal, as may be required at the Court House, County Jail and County Almshouse, during the ensuing year. Bids should indicate prices on the different grades of coal both on track at the railroad and delivered in bins at the places noted. Address County Clerk, Jasper County Court House, Carthage, Mo.

✚1319—Boise, Idaho—Sealed bids will be received until 2 p.m., Sept. 1, for furnishing the Idaho Soldiers' Home and the State Penitentiary with their annual fuel requirements during the ensuing year. The coal for the Soldiers' Home is to be Aberdeen, Castlegate or an equally high grade product; for the penitentiary 24 carloads of slack coal and four tons of nut will be required. Address Secy. Geo. R. Barker, Capitol Bldg., Boise, Idaho.

✚1320—Hamilton, Ohio—Sealed bids will be received until 10 a.m., Sept. 1, for furnishing the County Government with 600 tons of 3-in. West Virginia screened lump, 300 tons to be delivered f.o.b. cars at Hamilton during the month of September, and the balance to be delivered in the basement of the Court House during the same period. Address County Audr. W. W. Crawford, Hamilton, Ohio.

✚1321—Plymouth, Ind.—The Board of County Commissioners will receive bids until Sept. 7, for furnishing 280 tons of Pocahontas egg coal. Address County Audr. G. F. McCoy, Plymouth, Ind.

✚1322—Brownstown, Ind.—The Board of County Commissioners will receive bids until Sept. 7 for furnishing coal as may be required during the ensuing year. Address County Audr. Albert Luedtke, Brownstown, Ind.

✚1323—New York, N. Y.—The army engineers at this place will receive bids until noon, Sept. 24, for furnishing and trimming into the United States dredges in New York Harbor from 9000 to 25,000 tons of bituminous coal. The contract is to run over the period ending Sept. 30 of next year. For the list of bids on this business last year see contract No. 16, Vol. 6, p. 854. Address United States Engineer Office, Room 707, Army Bldg., 39 Whitehall St., New York City.

✚1324—Port Engles, Wash.—The School District No. 7 will receive bids until Sept. 1, for furnishing 100 tons of coal to be delivered to the new central building. Address Clk. Madge H. Nailor, Dist. No. 7, New Engles, Wash.

✚1325—Canton, Ohio—The Stark County Board of Commissioners will receive bids until 10 a.m., Aug. 30, for furnshing approximately 1500 tons of lump mine-run and slack coal. Quotations should be made f.o.b. Canton, Ohio. Address Board of Commissioners, Stark County, Canton, Ohio.

✚1326—Dalton, Ohio—Sealed bids will be received until 6 p.m., Aug. 28, for furnishing and delivering coal to the subdistricts of Sugarcreek township during the period ending Jan. 1, 1916. About 70 tons will be required altogether. Address Clk. Clayton L. Arnold, Bd. of County Comrs., Dalton, Ohio.

1327—Panama, C. Z.—The Panama R.R. Co. will receive bids until noon, Sept. 3, for furnishing their coal requirements during the twelve months ending Sept. 15, 1916. The estimated tonnage involved is between 500,000 and 600,000, although no quantity is actually guaranteed. For data in regard to previous letting of this contract, see "Coal Age," Vol. 6, pp. 814, 854. On the current contract it is provided that the best quality, steaming, semibituminous mine-run coal only is desired. When coal is delivered on cars alongside of steamer, 65% of it must pass over a ¾-in. square opening and at least 30% must pass over a 3-in. bar screen. It must not contain over 3% moisture in the delivered coal, 6½% ash in the dry coal, 21% volatile matter or 1% sulphur, and must contain at least 72½%, fixed carbon, and have a B.t.u. value of 14,700 on dry coal. All bids must be accompanied by a certified chack for $1000 and the successful bidder will be required to submit a bond in the sum of not more than $30,000. Bids on a portion of the tonnage only will be received and considered. There is a provision in the specifications by which bonuses will be given for coal exceeding the requirements as to analysis and also whereby the railroad may at its own discretion accept inferior quality by making a proportionate reduction. Address Asst. Pur. Officer, R. E. Rutherford, Panama Railroad Co., 24 State St., New York City.

✚1328—Jacksonville, Fla.—The County Commissioners will receive bids until 2 p.m., Sept. 4, for furnishing 3-in. screened lump coal as may be required during the ensuing year. The successful bidder will be required to give a bond guaranteeing the faithful performance of the contract. Address County Clk. C. A. Boruff, Jacksonville, Fla.

✚1329—Plainview, Neb.—The School Board of Dist. No. 5 will receive bids until Sept. 1, for furnishing lump and nut coal as may be required during the ensuing year. Address Secy. F. C. Holbert, School Bd. Dist. No. 5, Plainview, Neb.

✚1330—Sentinel Butte, N. D.—The Board of Directors of the Sentinel Butte School Dist. No. 2, will receive bids until noon, Sept. 1, for furnishing and delivering 100 tons or more of lignite coal to the local school as may be required during the ensuing year. Address Clk. John Gilbertson, Sentinel Butte School Dist. No. 2, Sentinel Butte, N. D.

✚1331—Fairpoint, Ohio—The Board of Education of Wheeling Township will receive bids until noon, Sept. 3, for furnishing coal as may be required to the various schools, deliveries to be completed before Oct. 15 of the current year. Address Clk. Addison Saffell, Bd. of Edu., Fairpoint, Ohio.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

✚No. 787—Springfield, Ohio—This contract (Vol. 7, p. 1005), which provides for furnishing the Hospital Board with coal, has been awarded the **Beckley & Myers Co.,** at $2.60 per ton for West Virginia bituminous mine-run. About 25 carloads will be required. Other bids on this contract were: Springfield Coal & Ice Co., $2.45; Grube Coal Co., $2.45 and $2.60, the latter bid being on Red Jacket coal. Address Clk. William H. Mahoney, Board of Hospitals, Room 2, City Bldg., Springfield, Ohio.

No. 856—Kansas City, Mo.—Additional information regarding the awards on this contract (Vol. 7, p. 1085, Vol. 8, pp. 40, 158) has been received as follows: **J. T. Wellington** will furnish 3900 tons of Cherokee lump bituminous at $3.54 per ton and the **Sweeney Coal Co.**, 2900 tons of semianthracite at $5.20 per ton. On last year's business the bituminous cost $3.54 and the semianthracite $5.34. Address Pur. Agt. F. S. Casey, Bd. of Edu., Kansas City, Mo.

No. 885—Detroit, Mich.—This contract (Vol. 7, p. 1086), which provides for furnishing the Lighthouse Department with coal during the fiscal year ending June 30, 1916, has been awarded on the following basis: DETROIT DEPOT including light stations in lower end of Eleventh U. S. Lighthouse District was awarded to **J. & T. Hurley**, Detroit, who bid $3.50 on three-quarter lump trimmed in bunkers or forked and bagged and $8 on anthracite, the total estimated amount aggregating $15,000; the United Fuel & Supply Co. bid $3.48 in bunkers, forked and bagged at $3.64, anthracite stove $7.69 and chestnut $7.94. The contract for the DULUTH DEPOT was awarded to the **Northwestern Fuel Co.** at $3.97 for three-quarter lump trimmed in bunkers, $4.53 forked in bags, $8.79 for anthracite chestnut and $8.51 for egg and stove; the Pittsburgh Coal Co., bid $3.97 for three-quarter lump trimmed in bunkers, $4.53 forked in bags, $9.07 for anthracite chestnut and $8.79 for egg and stove. The contract for the SAULT STE. MARIE district was awarded to **George Kemp**, at $3.30 for three-quarter lump trimmed in bunkers, $3.60 forked in bags and $7.40 for anthracite in bags, all delivered at the Lighthouse depot, Sault Ste. Marie; the Perry Coal Co. bid on this same business $3.35 for three-quarter lump trimmed in bunkers, $3.70 forked in bags and $7.90 for anthracite in bags. The **C. Reiss Coal Co.** was awarded the contract for the ASHLAND, WIS., DEPOT at $4 for three-quarter lump trimmed in bunkers, $4.40 forked in bags and $8.80 for anthracite egg and stove size. Address Inspector Edward L. Woodruff, Eleventh Lighthouse District, Detroit, Mich.

+No. 892—Jacksonville, Fla.—This contract (Vol. 7, p. 1086, Vol. 8, p. 76), which provides for furnishing the U. S. Engineers' Office at this place with 5500 tons of coal, was awarded to the **Logan Coal & Supply Co.**, and the **Tampa Coal Co.** The former bid, $4.42 per ton for 4000 tons and the latter $5.75 for 1500 tons. Address, District Engineers' Office, P. O. Drawer 45, Jacksonville, Fla.

No. 984—Kansas City, Mo.—This contract (p. 41), which provides for furnishing Smith & Sons Manufacturing Co. at this place with coal during the ensuing year, has been awarded to the **Gray-Bryan Sweeney Coal Co.** While the price at which the business was done is not available, it is understood to have been less than last year. Address S. F. Smith, Lydia & Guinotte Aves., Kansas City, Mo.

+1034—Youngstown, Ohio—This contract (pp. 115, 243), which provides for furnishing the Local Board of Education with approximately 5000 tons of coal, has been awarded to the **Crystal Ice Co.**, at $2.70 per ton for 1½-in. lump, $2.50 per ton for nut and $1.75 per ton for slack. Address Dir. W. N. Ashbaugh, Bd. of Edu., School Dist. No. 20, W. Wood St., Youngstown, Ohio.

+1058—Plymouth, Mass.—This contract (pp. 116, 283), which provides for furnishing the county commissioners with 400 tons of egg and 100 tons of a high-grade bituminous coal has been awarded to the **E. P. Reed Lumber Co.**, of North Abington, who bid $6.40@6.60 on Lehigh egg coal and $4.95 on Pocahontas. Address, County Com. Lyman P. Thomas, Plymouth, Mass.

+1065—Kansas City, Kan.—This contract (p. 116), which provides for furnishing the Board of Education with 90,000 bu. of Cherokee lump, and 1000 bu. of slack coal have been awarded to the **Buchan Coal Co.**, of this city, at $3.25 for lump, and $3 for slack coal. The prices are slightly under the figures of last year. Address Pur. Agt. L. Friedman, Bd. of Edu., Kansas City, Kan.

+1068—New York, N. Y.—This contract (pp. 117, 243, 283, 323), which provides for furnishing the Department of Docks and Ferries with approximately 1500 tons of egg coal, has been awarded to **Pattison & Bowns**, at $5.33 per ton. Address Dock Com. R. A. C. Smith, Pier A, North River, New York.

1088—New York, N. Y.—Additional details regarding the award of this contract (pp. 117, 198, 325), which provides for furnishing the Department of Bridges with 250 gross tons of No. 1 buckwheat and 250 gross tons of mine-run bituminous, have been received as follows: As previously noted the contract was awarded to **Burns Brothers**, and was dated July 30, the consideration being $3.25 on the buckwheat and $3.30 per ton on the bituminous. Address Comr. F. J. H. Hracke, Municipal Bldg., New York City.

Contract Notes

Pennsylvania R.R.—Press reports are to the effect that the Pennsylvania R.R. is stocking coal heavily.

Chippewa Falls, Wis.—The contract to furnish the city with its winter's supply of coal was awarded to the **Clark Grain & Fuel Co.**

Valparaiso, Ind.—The Board of County Commissioners let the contract for 200 tons of Pocahontas coal to **M. Coash**, of this city, at $4.95 a ton.

Goshen, Ind.—The bids received by the Board of County Commissioners for coal for county uses next year were not satisfactory and new bids will probably be asked at the September meeting of the Board.

Cambridge, Ohio—The Board of Control has awarded the contract for furnishing coal for the city power and light house to the Puritan Coal Co. at $1.19½c. for run-of-mine and $1.29½ for three-quarter-inch coal. The National Coal Co. bid $1.20 for mine-run and $1.30 for three-quarter inch.

Bear Creek, Mont.—The Interstate Commerce Commission, acting on a complaint filed by the Bear Creek Coal Co., has ordered the railroad rate on screenings from Bear Creek, Mont., to Metaline Falls, Wash., reduced from $4.25 to $3.75 per ton. The screenings are used at Metaline Falls in the manufacture of cement.

Baltimore & Ohio R.R.—The Baltimore & Ohio R.R. has awarded its annual coal contracts. About twenty-five firms, whose names were withheld by the road, but with mines located along its lines, received awards which totaled 6,000,000 tons for delivery over the next twelve months. The Consolidation, New England Coal & Coke and Quemahoning Coal concerns are understood to have figured largely in the awards.

Hazleton, Penn.—It has been noticed that all of the large anthracite companies who have storage yards are filling them to their capacity at this time, with a possibility of a suspension in view. For some weeks past the Lehigh Valley R.R. has been placing large quantities of engine fuel in their storage plant at Hudsondale, and all of the other railroads seem to be taking the same precaution.

Oklahoma City, Okla.—Contract to furnish coal for Oklahoma City schools has been awarded the **M. B. Schofield Co.** of Oklahoma City, which agreed to furnish 700 tons of semianthracite at $3.35 per ton, for the high school and 2000 tons or more of Dewar coal at $3.75 per ton for the ward schools. Enforcement of this contract by the Board of Education has been enjoined on the application of Dr. L. Haynes Buxton, alleging a lower bid was submitted by Mgr. C. C. Buxton of the Garrison Coal Co., Oklahoma City.

Columbus, Ohio—No legal action has yet been taken in an attempt to abrogate the contract (p. 286), entered into by the trustees of the Ohio State University with the Lorain Coal & Dock Co. to supply the university with 15,000 tons of coal from the Logan County, W. Va., mine. The news of the award of the contract has raised a storm of protest because of the campaign which has been started to "use Ohio-mined coal." It may be that some steps will be taken to abrogate the contract but the method to be followed has not been outlined as yet.

St. Marys, Ohio—The contract for furnishing the electric light plant with coal during the ensuing year has been awarded to the **Avon Coal Co.** at 72½c. per ton for mine-run coal. The following is a complete list of bids submitted:

COAL BIDS RECEIVED JULY 21, 1915

Bidder	Nut and Slack	Mine-Run
The Chesapeake & Ohio Coal Co.	....	$0.75
West Virginia Pocahontas Coal Sales Co	$0.70	.87
The Carbon Fuel Co	.75	.85
The Reliance Coal & Coke Co	.64[1]	.87
The Colonial Coal & Supply Co	....	.80
The Black Diamond Coal Co	....	.97½
Kentucky Fuel Co. (no bond)	.75[2]	.60
Victoria Coal Co (no bond)	.45[3]	.80[4]
The Lorain Coal & Dock Co	.60	.80
The Seidenfeld-Hammond Coal Co.	....	.95
Hatton, Brown & Co	.75	.95
Smokeless Fuel Co	.54	.74
Ohio & Michigan Coal Co	.75[3]	....
Hocking Valley Products Co	....	1.05
Edmund A. Coal Co	.60	.84
Bewley-Darst Co	....	.75
Avon Coal Co	.65	.72½
Kittanning Coal Co	....	.81
S. J. Patterson Coal Co.	....	.85[6]
Castner, Curran & Bullitt, Inc	.70	.77½

[1] Also 82c. [2] Also 85c. [3] Also 50c. [4] Also 92½c. [5] Also 75c. [6] Also 95c.

COAL AGE

Vol. 8 NEW YORK, SEPTEMBER 4, 1915 No. 10

Dust and its Allayment

Research has proved that every space in the universe is pervaded with dust of some sort. Cosmical dust is known to be continually falling upon the earth. A rift in the clouds shows a bar of sunshine and dust or vapor. A hole in the shutter admits a peep of sunshine and reveals a streak of dust. The atmosphere of machine shops where quantities of cast iron are being turned is pervaded with iron dust which sparkles in the gaslight, but is not otherwise visible. The dust of flour mills is also invisible or unnoticeable, but it is there all the same, and explodes under certain conditions.

The atmosphere of coal mines is notoriously addicted to dust, and to explosions attributable thereto. All explosions in mines are not traceable to coal dust; some are caused by gas, or by gas and dust combined.

The circulation of air necessary for proper ventilation compels also a circulation of dust which may accumulate in spots to such density as to become explosive. The admixture of gas may determine the explosive point. Anyway explosions occur, and it is not always known which is the detonating medium.

Increased ventilation would seem to be the rational remedy. But on the other hand increased currents of air stir up and circulate the dust in greater quantity. Spraying is recommended and practiced in some mines, but when plain water is used it soon dries and the dust becomes as bad as ever.

At the risk of "butting in," I would recommend a spray composed of fire clay dissolved in water to a consistency of milk, and applied by a barrel sprayer on a truck or coal car, which can be moved around wherever tracks are laid. Such a mixture would seal the dust to the walls, or precipitate it to the floor; and incidentally the spraying operation would pick up and concentrate much of the floating dust. If this were thoroughly done and kept well up to the workings the danger from dust would be lessened, and the ventilation would do the rest —perhaps.

It would be expensive to whitewash the whole interior of a mine; but so is an explosion, and of the two evils the lesser should be chosen.

Straight Line Ventilation

The experienced mine foreman, or superintendent, is probably the highest authority on the distribution of air in mines. Every miner and operator knows how disagreeable it is to work in a swiftly moving current of air. Therefore, the flow of air at the working faces should be as moderate as is commensurate with safety and health. But in a practical consideration the air must be forced with sufficient velocity and tension to carry it to the furthermost working point. Consequently the main lines of ventilation should be straight and direct, and the distribution conducted at right angles from the main, or possibly in a reverse direction.

In such a condition as this it would require less power to circulate a given quantity of air than in mines where the air courses run zigzag at numerous angles regardless of proper distribution. It is well known that a few right-angle turns knock the life out of a current of air, unless it has a powerful force behind it, hence the advantage in straight lines. The same rule applies to water in pipe lines.

It is frequently noted that some fans do not deliver half the amount of air for which they are rated. Others of identical construction, under favorable conditions deliver their rated capacity.

The roughness or unevenness of the walls mean much, but the main cause of the difference in fan deliveries is the indirect air courses.

The present fashion in higher speed fans is given the credit (to which they are entitled), for improved ventilation, but no credit is accorded the present better distribution of air. Mines are better planned and arranged now than formerly, and hence the ventilation improves year by year.

It is well known that all fans are not equally efficient. One of the most lauded ones at the last Paris Exposition would not blow a man's hat off, when in the direct current and with the fan at full speed. Yet this same fan has been copied in this country.

Actions speak louder than printer's ink, but printer's ink in some cases is the lubricant most used. It is not always the best, however.

By C. W. CRAWFORD

Uses for Underground Fans

By Henry Briggs*

SYNOPSIS—Underground fans may be used for main ventilation, for boosting or merely for cooling purposes. When used as the mainstays in ventilation, they permit the outside standby fan to be protected by doors and so increase safety. However, if they are electrically driven they introduce the dangers inherent in the use of that power.

Underground fans are already a familiar feature of British mining. They are being used, (1) as main ventilators, responsible for the whole ventilating current; (2) as auxiliary ventilators, otherwise known as "booster" fans, assisting the work of the surface fan in ventilating certain sections of a mine; and (3) as "closed-circuit" ventilators, whose purpose is to create a more rapid flow of air in specially hot parts of a mine.

In this last application the underground fan, which is usually small, does not add to the volume of air passing through the mine; it merely induces a closed circulation of air within the workings. The quicker local flow is, however, beneficial to workers in hot places.

UNDERGROUND FANS AS MAIN VENTILATORS

Not many mines go so far as to use underground fans as main ventilators. When they are so applied, a surface fan must be installed of a capacity sufficient to ventilate the whole mine in case of a disaster to the underground machines. The standby fan at the surface must also be arranged to allow of the air being reversed, provision for such reversal being compulsory in British collieries. Rare though it be, the utilization of underground fans as main ventilators has much in its favor, especially where several seams are being worked from the same pair of shafts.

Instead of adjusting the flow into the various seams by artificially impeding the current in the shorter and more greedy sections by means of regulators—the only method possible when one fan at the surface serves them all—regulation in the newer method can be provided by the adjustment of the speeds of the fans in the different seams or districts. The result is that to circulate given quantities of air in each of the sections less power is absorbed by several fans working in parallel than by a single surface fan.

The provision of a standby fan at the surface removes much of the weight of the objection that underground fans may be destroyed by an explosion. The question is, however, one worth examining a little further. When the regular ventilation of a mine is entirely produced by fans below ground, both the shaft mouths are normally open, and the standby is completely shut off from the mine by one or more steel doors.

If a large explosion were to take place, we must assume, to be on the right side, that every fan underground would become unworkable; yet the open shaft mouth and the protection of the steel doors render it less likely that the surface fan would be damaged than if it were in operation as the main ventilator. Hence it is permissible to conclude that the reëstablishment of the air current after an explosion would actually be easier when underground fans generate the entire normal air current.

BOOSTER FANS TO ASSIST MAIN VENTILATOR

The chief use of the underground fan at present is, however, as a booster, running "in series" with the main ventilator at the surface and assisting the latter in airing some section which requires an abnormal air supply or possesses abnormal resistance.

Disappointment has sometimes been expressed at the performance of an underground fan working in series with one at the surface, owing to the comparatively small increase in air volume resulting from that combination. The late Walton Brown was, I believe, the first to show that such a result was strictly in accord with theory. His analysis of the problem will bear repetition:

Let Q_1 and h_1 be respectively the yield in cubic feet per minute and the water gage generated by the main fan when running alone; and Q_2 and h_2 the equivalent yield and water gage for the underground fan also when working alone. Also let Q and h represent the yield and gage when the two fans work together and in series.

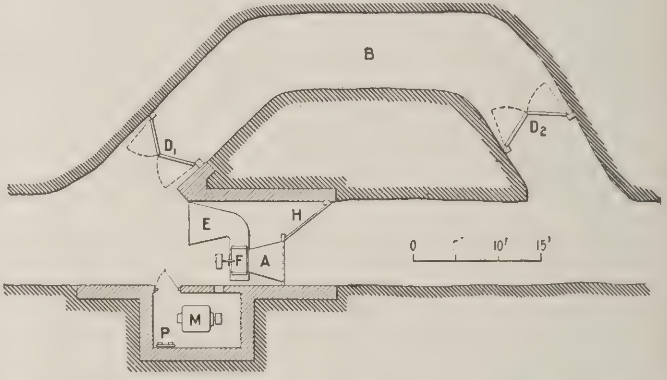

FIG. 1. ARRANGEMENT OF SIROCCO FAN AND MOTOR

The useful work done in moving air when the main fan runs alone is 5.2 $h_1 Q_1$ ft.-lb. per min., and when the underground fan works alone, 5.2 $h_2 Q_2$ ft.-lb. per min.

When the two operate together, the total useful work done will be 5.2 $(h_1 Q_1 + h_2 Q_2)$, and this, otherwise expressed, is 5.2 $h\,Q$.

Therefore

$$h\,Q = h_1 Q_1 + h_2 Q_2 \qquad (1)$$

But as the air circuit remains very nearly unchanged in character, whether the main fan of the auxiliary work alone or the two run together, the water gage is, by Atkinson's rule, proportional to the square of the volume of air, or

$$\frac{h}{Q^2} = \frac{h_1}{Q_1^2} = \frac{h_2}{Q_2^2} = a\ constant \qquad (2)$$

Now equation (1) may be rewritten

$$\frac{hQ^3}{Q^2} = \frac{h_1 Q_1^3}{Q_1^2} + \frac{h_2 Q_2^3}{Q_2^2}$$

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*Professor Mining Department, Heriot Watt College, Edinburgh, Scotland.

and dividing through by the constant of equation (2) we obtain

$$Q^3 = Q^3_1 + Q^3_2 \qquad (3)$$

In practice the surface fan is the more powerful; that is, Q_1 is greater than Q_2. Even if the fans were to be made of equal power, making $Q_2 = Q_1$, the last equation would resolve into

$$Q = Q_1 \sqrt[3]{2} = 1.26\, Q_1$$

and the increase in air volume obtained would be only 26 per cent. of that of either fan running alone. It follows, therefore, that the quantity-increment due to placing one fan in series with another can never exceed 26 per cent. of the capacity of the more powerful of the two fans running alone.

We may take the investigation a step further than Walton Brown. By eliminating the quantity-factors between equations (1) and (2) we get a relation connecting the water-gages; namely,

$$h^{\frac{3}{2}} = h_1^{\frac{3}{2}} + h_2^{\frac{3}{2}} \qquad (4)$$

If the two fans were identical, h_1 would equal h_2, and equation (4) would become

$$h = h_1 \sqrt[3]{4} = 1.59\, h_1.$$

Hence it will be seen that the gage-increment due to placing two fans in series cannot exceed 59 per cent. of the gage-pressure generated by the stronger of the two working alone.

Experiment has well established the fact that the yield of a fan is directly proportional to its rate of revolution. This is a useful rule for the case we are discussing; for when the section of the mine served by the auxiliary fan becomes more extensive, it is necessary to meet the additional resistance or the additional demand for air by augmenting the speed of the fan.

The question then is, What increase of speed is required to bring about a given increase in air volume? Letting n_2 r.p.m. represent the required increased speed of the auxiliary fan and n_1 r.p.m. its speed when if operating alone it would circulate Q_2 cu.ft. of air per minute. By the rule stated, the auxiliary working alone at n_2 r.p.m. would produce $\frac{n_2}{n_1} Q_2$ cu.ft. of air per minute. Substituting into equation (3)

$$Q^3 = Q_1^3 + \left(\frac{n_2}{n_1} Q_2\right)^3 \qquad (5)$$

From this relation may be calculated the speed n_2 of the auxiliary so as to give a desired air-volume, Q, when the two fans run together.

METHODS OF INSTALLATION

Fans of the propeller type are rarely used in British colliery practice, although for setting in an underground roadway they have the advantage of giving a straight-line path for the air. Quick-running single-inlet centrifugal fans of the Sirocco class are most generally used in service below ground. Intakes being used for haulage, the fans are usually placed on the returns where they are out of the way of the traffic. Fig. 1 shows one such arrangement, the 40-in. single inlet fan *F* being driven by a belt from the motor *M*. Any required alteration of the speed of the fan is effected by changing the size of the pulley on the fan shaft.

The fan station must be well protected. In the case illustrated, the roof is supported by steel girders resting on side walls. The pass-by *B* is an essential provision, being needed by officials and others traveling the road, and is used when timber has to be taken past the fan or repairs made in the vicinity. The doors D_1 and D_2 are hung so that when *F* is running the pressure will keep them shut, yet should the fan stop for any reason, the doors will open by the suction of the main fan at the surface.

The partition *H* is of 1-in. tongued-and-grooved boarding, made so light as to act, with the doors, as a safety valve were an explosion to take place, the aim being to safeguard the fan itself as much as possible. By this arrangement, it will be noticed, it is necessary to turn the air, in passing through the fan, through an extra right-angle to gain the horizontal *évasé E*. Every such bend means of course some waste of power.

This difficulty is avoided by the arrangement illustrated in Fig. 2. This method of installation is convenient when the fan is placed in connection with an intake haulage road, allowing, as it does, of a straight-through passage for the haulage. When an underground fan is connected to a haulage road, doors unfortunately cannot be avoided.

PREFERABLE DRIVING POWER

Although power derived from falling water has been applied to small underground fans, ventilating "ends" in metalliferous mines, from a very early date, only two kinds of power—namely, electricity and compressed air—need be considered in discussing the modern application of these fans to collieries. If all the underground machinery at a mine is driven by compressed air, there is nothing more to be said; for any fan installed in the mine will naturally be similarly driven. But if the general power supply is electric, it is another matter.

One advantage of placing the fan on the intake is that an electrical drive is permissible. To run a fan on a return in airway in a gassy pit, however, and to drive it electrically when the motor room is ventilated by return air, is obviously impossible. It is risky even when the gas-content of the return air is normally well below 1 per cent. and when the motor and switch-gear are suitably protected.

Where safety is the paramount issue, we must reckon with the abnormal condition rather than with the usual. Gas may collect in dangerous amount through a temporary breakdown of the fan itself. In Great Britain the Mines Act requires the stoppage of electrical machinery should the firedamp content reach 1¼ per cent. Thus it might happen that a fan so driven would have to be stopped, to comply with the act, at the very time when it was most needed.

A successful way of circumventing this difficulty is to construct the motor room on the return, but at the end of a crosscut connecting with the intake, and to ventilate the place with fresh air carried in by a pipe. The end of the air pipe can conveniently be fitted with a shutter so that the air supply is under control. Should such a method be adopted, care must be taken to arrange matters so that every opening from the return to the motor room is on the inlet side of the fan, or else it would probably be found that, owing to the elevation of pressure caused by the fan, the air in the pipe ran in the opposite direction to that which is desired. The arrangement shown in Fig. 1, for example, would be faulty if the motor room were intended to be separately ventilated with intake air, for the openings to the room are all on the delivery side of the fan.

Another way of meeting the problem of driving a fan in the return of an electrically equipped colliery is to employ an electrically driven compressor in a neighboring intake and to lead the compressed air so generated to an engine working the fan. It is outside the scope of this article to discuss at all fully the pros and cons of inby compression. When it is adopted by mine superintendents it is not usually because they like it, but because there is no other solution. It means increased first cost, greater costs of operation, more trouble, and roughly twice the risk of breakdown to the fan or other machine which is being driven.

Negative Water Gage and Its Effects

I have just said that underground fans may cause a flow of air from a return back into an intake. This is owing to the fan heaping up pressure on its delivery side. Thus a water-gage reading taken between a point on the delivery side of an underground fan and a point in an intake close by may be negative. Hence, if doors were left open in a road connecting two such points, a closed air circuit would be set up and the intake would be flooded with return air. Moreover, the direction of leakage through stoppings or through the waste in such a neighborhood opposes the usual direction.

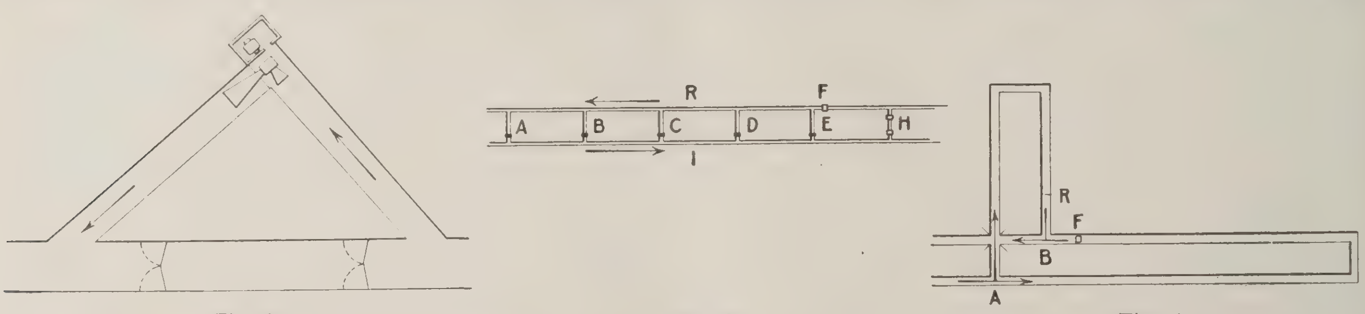

Fig. 2 Fig. 3 Fig. 4

FIGS. 2 TO 4. ILLUSTRATING SOME DIFFICULTIES ARISING IN THE OPERATION OF BOOSTER FANS

When Prof. J. Cadman, of Birmingham University, England, was investigating the ventilation of coal mines on behalf of the British Royal Commission on Mines (Government Bluebook, Cd. 4551, p. 9), he found just such an instance. A 40-in. Sirocco fan was in use on a return inby. A main intake in its vicinity was found to be considerably contaminated with return air, which made its way from the return at an air crossing and through certain stoppings and doors. Cadman measured the difference of pressure between the intake and return at a point close to the fan discharge. He got a negative water gage of $3\frac{1}{2}$ in. The return air near the fan contained 10 per cent. of blackdamp and $\frac{1}{2}$ per cent. of firedamp—"a very undesirable mixture to leak into the intake," as Cadman correctly remarked.

With an arrangement of roads similar to Fig. 3, it is evident, then, that special care must be taken to prevent leakage from the return *R* to the intake *I*. If it is considered necessary to have doors in one of the crosscuts, they should be placed at *H*, on the inlet side of the fan, rather than at *D* or *E*. The brick stoppings in the connections *E*, *D*, *C*, etc., should be well-built, recessed into the sides and coated over on their intake faces with mortar. Fine rubbish should also be banked up solid for 5 or 6 yd. behind each of them.

If there is an excess of pressure in the return at *E*, that excess will be less at *D* and less still at *C*. So that as we travel outby we shall sooner or later reach a neutral point, where there is a zero water gage. It is useful, even at some trouble, to find the whereabouts of that neutral point, by actual trial, in order to ascertain the extent of the zone over which special precautions against leakage must be taken.

Effect on Other Splits of Air

Fig. 4 shows diagrammatically two air splits of different lengths. Before the auxiliary fan was put in at *F*, the splits obtained an air supply depending in each case on the difference of pressure between the points *A* and *B*; and to increase the resistance of the shorter split and to prevent it taking more than its share of air, a regulator was placed at *R*. When the fan started to run, it created an increase of pressure at *B* and therefore a smaller difference of pressure between *A* and *B*, and the flow of air into the shorter split was checked. The larger split got an increased volume of air, it is true, but at the expense of a decreased supply to the shorter split.

This is exactly what was found to have happened when the late Walton Brown tested the ventilation of the Browney Colliery Co., Durham, England, after a Schiele fan had been installed underground to help the ventilation in one of the seams. His measurements showed that the air supply to the other seams worked from the same shafts had suffered a diminution (see *Transactions* of the Institute of Mining Engineers, Vol. XXXIV).

Now an influence of this character may not be harmful if small in magnitude, for it may be found possible—glancing once more at Fig. 4—to compensate for it by opening the regulator *R*; but if the fan is stationed close to *B*, that point may actually be within the zone of negative water gage. In that case the flow in the shorter split would be reversed and a closed-circuit current set up round the two districts.

A study of the underground fan therefore reveals that, useful though that machine may often be, it introduces a number of special problems and places some new difficulties on the shoulders of those responsible for the control and supervision of the ventilation of the mine.

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At the Working-Faces, unless the coal is unusually brittle, there is not, generally speaking, sufficient dust to initiate an explosion. The dangerous accumulations of coal dust are almost exclusively confined to the main haulageways, and Professor William Galloway cites as the three main sources of dust: (1) Coal falling from mine cars which is ground by degrees into the form of dust by the traffic and carried by eddies and currents of air along the roadways. (2) Dust blown off the coal contained in the wagons during their transit from the working-places to the hoisting shafts. (3) Dust from the screens that is carried down the downcast in the descending air current.

New Style of Coke Ovens

Throughout the country the attention of coke manufacturers and others interested in coke or byproducts of coal is turned toward Chattanooga, Tenn., where the first Roberts coke ovens erected are being operated by the Chattanooga Gas & Coal Products Co.

The inventor claims that from the standpoint of quick conversion of coal into coke these ovens will prove more efficient than any other type used in this country or even in Germany, where the art of coking coal is conceded to be the highest attained, economy and expeditious work considered.

If Mr. Roberts' design proves successful, gas and coke manufacturers expect it to revolutionize the coke industry in this country, and numerous visits are expected from Northern manufacturers.

Heat was started on the ovens—for the Roberts ovens are fired from the top in a way never attempted before—about June 1, and it was fully 30 days later that a sufficiently high temperature was reached to permit coking.

CHATTANOOGA GAS & COAL PRODUCTS CO.'S PLANT

A perpetual-motion process of operation is incorporated in the Roberts ovens; that is, each charge of coal is carbonized by the burning of gas generated by former charges. This made it necessary for the Chattanooga Gas & Coal Products Co. to contract with the Chattanooga Gas Co. for the purchase of gas to bring the ovens to their first heat.

Use of Powdered Coal as Fuel

At the seventh annual convention of the International Railway Fuel Association, W. L. Robinson, supervisor of fuel consumption of the Baltimore & Ohio R.R., presented a paper outlining the advantages that might result from the use of powdered coal in locomotive furnaces, and from this article the following costs of pulverizing are taken.

The cost of preparing powdered coal will vary with the cost and moisture content of the raw coal. However, a general average from available data covering periods of the past five to ten years at cement and metallurgical plants has made it possible to present a conservative estimate, assuming the cost of the raw coal at from $1 to $2 per short ton, and that it will require crushing and have a moisture content of from 5 to 10 per cent. when placed in the drier. The plant capacity is given in short tons per 10-hr. day and the cost given covers all the items of expense in the preparation of a short ton:

Capacity	Cost	Capacity	Cost
20	25 to 50c.	50	14 to 35c.
30	20 to 45c.	100	12 to 30c.
40	16 to 40c.	250	10 to 20c.

The fuel required for drying the coal will average from 1 to 2% of the coal dried. The total cost is distributed approximately as follows:

Fuel for drying	10%
Power for operation	30%
Labor	30%
Maintenance and supplies	25%
Interest, taxes, insurance and depreciation	5%
Total	100%

The cost of preparing powdered coal should be more than offset by the ability to utilize mine refuse and sweepings, run-of-mine, screenings and slack grades of coal that cannot be used to advantage otherwise, and inferior grades of sub-bituminous coals, lignite and peat of relatively lower cost per ton than the readily salable commercial fuels.

To feed the coal into the furnace in a finely divided or powdered state is the most advanced method of producing perfect combustion. While a cubic inch of solid coal exposes only 6 sq.in. for absorption and liberation of heat, a cubic inch of powdered coal exposes from 20 to 25 sq.ft., which makes possible a more uniform gas production from the volatile matter in the coal and more prompt and perfect intermingling of gas and air, thereby improving combustion and reducing smoke. Furthermore, there is no cooling of the fire by heavy intermittent charges of fresh coal, as is the case with hand or stoker firing on grates.

Powdered coal may be burned by either of two generally defined methods—the long-flame method, constituting a progressive burning of the coal such as is employed in cement and openhearth furnaces, and the short-flame method, which is the latest development and is used in metallurgical and similar metal-heating work or under boilers where a similar furnace volume obtains.

Variable-Speed A.-C. Motors for Driving Mine Fans

By F. B. Crosby*

SYNOPSIS—Means of changing the speed and consequently the capacity or water gage of mine fans are highly desirable if power is to be conserved. Heretofore alternating-current motors driving mine fans have been mostly of the single- or double-speed induction type. A variety is now available, however, that may be readily and easily adjusted through a considerable range of speed and which possesses meanwhile efficiency characteristics at least as good as those of the induction motor.

With the increasing complexity of industrial society, intelligent provisions must be made for the artificial maintenance of those conditions necessary to life which in the open are amply provided by nature. Generally speaking, impure water and vitiated atmosphere are more likely to be encountered in the vicinity of human habitation than elsewhere; particularly is this true as the variety and magnitude of industrial activity increase.

The continuous supply of properly diluted oxygen of the requisite humidity for public buildings, hotels, theaters, offices, factories, etc., as well as for subways, tunnels and mines is at last receiving a much-deserved attention. The humanitarian and economic advantages of substituting normal and healthful for abnormal and injurious conditions are beginning to be appreciated.

In its simplest terms ventilation is merely the exhausting of depleted air from and the blowing of fresh air into a confined space. The details of design of suitable devices for moving the air in such a manner as to obtain the pressure and volume required at a given point remote from the source of supply, with a minimum expenditure of energy, as well as the problem of most efficiently distributing this energy, are beyond the scope of these remarks, which must be confined chiefly to certain typical requirements for underground ventilation, together with the several systems of control which have been developed to meet such requirements. Two general conditions must be considered:

A. Those requiring approximately constant pressure or volume, such as tunnels, and subways of fixed dimensions and resistance.

B. Those in which the volume or pressure, one or both, must be varied frequently because of one or more of the following reasons: Increasing length and resistance of airways; economy in power consumption during idle periods, nights or holidays; to meet emergency requirements for increased pressure because of airways blocked by falling rocks; a temporary increase in the working force; to clear the mine of powder smoke or to sweep excess gas from pockets, etc.

For Constant Conditions Use an Induction Motor

For condition A there is no question that a standard squirrel-cage induction motor direct-connected to a suitably designed fan affords the simplest sort of installation, possessing high efficiency together with minimum maintenance and operating charges.

A direct-current motor can of course be used equally well, but as compared with the squirrel-cage induction motor the direct-current machine is subject to the disadvantage of a less efficient distributing system, which is an important point when, as is usually the case with mine fans, the air shafts are far removed from the power house. The direct-connected motor is handicapped also by a somewhat more complex starting equipment, commutator and brushes, which are wearing parts and which are not present in the squirrel-cage type of motor. Furthermore, the direct-current motor cannot be guaranteed absolutely sparkless under all conditions. This in the presence of gas is a vital objection.

In applying squirrel-cage motors, however, especial care should be taken to ascertain whether such a motor will start and satisfactorily accelerate the fan to full speed. With modern fans of small diameter with small Wr^2 or flywheel effect this feature need hardly be considered, but for large diameter slow-speed belted fans the character of the torque curve of the squirrel-cage type of induction motor is such that even if a given motor has sufficient turning effort to start the fan from rest without prohibitive current from the line, the torque increases so rapidly near synchronism that the belt is liable to snap or jump off the pulley.

For such cases a motor with phase-wound rotor and secondary resistance should be used. This will permit a much higher starting torque and will also give much smoother acceleration.

In discussing the second group, B, it is only fair to say that among mine operators there are two opposing camps. The one makes sweeping claims that variable-speed motors are never required; that all necessary speed changes can be obtained by using belt drive and changing the diameters of the pulleys. The advocates of this policy will sometimes admit the desirability of a multispeed motor, that is one which has two or possibly three constant synchronous speeds depending upon the external connections for corresponding polar groupings.

The other side claims always an advantage for the variable-speed motor. In the writer's opinion neither is always right. Where conditions approximate A the constant-speed motor is desirable as it is efficient, cheap and simple. Most metal mines and some coal mines are practically free from gas, and in older workings, owing to opening new headings and closing old ones, the same resistance may remain nearly constant for long periods.

The power required to drive a fan usually varies somewhere between the cube and square of the speed; consequently a two-speed motor of the changeable-pole induction type if operated at half speed when the men are out of the mine will save considerable power. If operations are carried on the full 24 hours this feature loses weight. If conditions are such that the fan must be speeded up from time to time, but never in emergency, the changeable-pulley method will serve within obvious limits.

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*General Electric Co., Schenectady, N. Y.

In advocating this method, however, the cost of extra pulleys, belts and larger fan house, the labor of changing pulleys (which of course can be done only when the men are out of the mines), as well as the inability to take care of the emergency requirements mentioned under B, must be borne in mind.

IN VENTILATION ALL PRECAUTIONS SEEM JUSTIFIED

Mining laws in many of the states are becoming more and more insistent on safety, the tendency being carried in some cases to absurd limits. In the matter of ventilation, however, all possible precaution seems fully justified, and to meet most satisfactorily the demand for absolute continuity of service at high efficiency under widely varying conditions of volume and pressure a variable-speed motor must be employed.

Until about three years ago it was necessary in such cases to resort to direct-current motors or motors of the phase-wound rotor induction type with variable external secondary resistance. The former is objectionable for the reasons mentioned. The induction motor with rheostatic control is chiefly objectionable because of its low efficiency at reduced speed.

The aggregate energy wasted in this manner throughout the country is enormous, as must be evident when the speed-torque characteristics of the induction motor are appreciated. There are in service today many large induction motors of capacities up to 1000 hp. driving mine fans, which have been in operation continuously with rheostatic control at from 30 per cent. to 50 per cent. speed reduction for periods of from 4 to 7 years. When operating at constant torque at reduced speed the input to an induction motor is practically constant and the secondary losses proportional to the reduction in speed.

If efficiency is plotted against speed and a straight line drawn from the point corresponding to full load efficiency and speed the efficiency for constant torque at any other speed may be read directly from the curve. With fan drives, since the horsepower varies roughly as the cube, and hence the torque as the square of the speed, the efficiency is still lower.

For very low speeds this may not prove serious from the standpoint of cost of energy, since though the efficiency is low the actual horsepower output is also low, but for ranges between 50 per cent. and 100 per cent. on large motors the excess cost of power over methods described below may easily amount to $2000 a year at the usual cost of power per kilowatt-hour.

In this connection it may be of interest to note that if

S = Slip in per cent. of synchronous r.p.m.,

$1 - S$ = Speed in per cent. of synchronous r.p.m.

Then regardless of whether the torque increases, decreases or remains constant as the speed is varied, the total secondary or slip energy of the motor dissipated as heat with rheostatic control is always equal to $\frac{S}{1-S}X$ shaft output expressed in horsepower or kilowatts.

The fact that an induction motor with rheostatic control has a series speed characteristic and tends to accelerate to synchronism when the load is thrown off is not usually a serious objection, since fan loads are ordinarily quite steady.

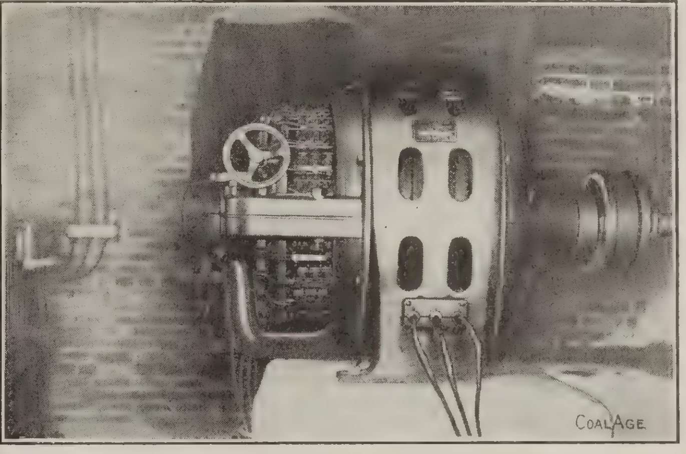
Much effort and expense were undertaken by electrical companies in the endeavor to devise an alternating-current motor or system of control for such machines which would have the desired high efficiency, high power factor with variable or adjustable speed characteristics. In the spring of 1912 the writer had the pleasure of describing before the mining section of the A. I. E. E. at Pittsburgh several possible methods of obtaining speed control for fan drives and particularly two methods which although at that time still experimental in this country had been successfully applied some years previous in Europe.

Since that time both these methods have been modified and developed to meet the demands of American practice and a considerable number of the type PCS (polyphase commutator brush-shifting) motors in capacities up to 150 hp. and also the so-called type PCR auxiliary speed-regulating sets for use with standard induction motors for driving mine fans up to 250-hp. capacity have been in continuous use for varying periods up to nearly two years. Each of these methods has proved successful, and is worthy of more consideration than can be here given.

CONSTRUCTION OF THE NEW TYPE OF MOTOR

The type PCS motor consists chiefly in a stationary part or stator with three-phase distributed winding similar to that of a standard induction motor. The rotor is similar to that of a standard direct-current motor, but is provided with a larger number of brushes so mounted that the entire supporting yoke can be rotated by means of a handwheel.

A FAN AND MOTOR HOUSE AT AULTMAN, PENN., CONTAINING A TYPE PCS MOTOR



A TYPE PCS MOTOR DRIVING A 100,000 CU.FT. FAN AT AULTMAN, PENN.

For convenience of design a series transformer is commonly used to supply current to the armature. A suitable oil switch with overload and low voltage features is usually combined with this transformer. The chief function of the transformer is to provide a low potential for commutation usually considerably less than 100 volts. This constitutes the entire control, which is by far the simplest ever devised for an electric motor excepting possibly the constant-speed squirrel-cage type of machine.

The motor is started, accelerated, stopped and reversed simply by shifting the brushes. This shifting is accomplished by means of worm gears and a handwheel conveniently mounted on the frame of the machine. If desired a small pilot motor can be used and the machine perfectly controlled from a remote point.

Since in effect the total number of ampere turns in the stator are equal to and in series with those of the rotor it is evident that with the brushes set in the same axis as the stator windings, the angle $a = 0$, and no field is produced by the line current. If the brushes are now shifted through an angle a, the balance between rotor and stator windings no longer exists, and the resultant ampere turns produce an excitation proportional to the current in both windings and to the angle of brush shift. The motor, therefore, will develop a torque proportional to the square of the line current and the angle of brush shift.

If the angle of brush shift is 180 deg., no torque is developed, since the stator field and rotor current are 90 deg. out of time phase. With brushes in this position, the magnetizing current only, which is about 10 to 15 per cent. of the normal full-load current is drawn from the line, and the main-line switch can be closed without starting or in any way injuring the motor.

If now the brushes are gradually shifted forward, the line current and motor torque increase slowly at first until the motor starts very gently. As the brush shift is increased the torque curve begins to rise rapidly, so that any desired value of starting torque within the limit of design of the motor in question is available. By actual tests some of these motors have started successfully and without appreciable sparking under 400 per cent. of normal rated torque. This value, however, is somewhat higher than could reasonably be expected in economical design.

Shifting the Brushes Controls the Motor

By merely shifting the brushes perfect speed control is obtained throughout, approximately 75 per cent. of the range from rated speed to stand still. In general 40 to 60 per cent. speed control is ample, and obviously a request for greater range should be avoided unless really necessary as the greater range means a more expensive machine except in certain cases like fan service, where the load falls off rapidly as the speed is reduced.

If the brushes are shifted beyond $a = 180$ deg. the motor will start in the reverse direction. In order to obtain the best commutation, however, it is necessary to interchange two of the primary phases. This reverses the rotating field of the stator, giving it the same direction of rotation as the armature. Commutation is sparkless from about 10 per cent. above to approximately 70 per cent. below synchronism.

The lower speed limit is determined by the torque characteristics rather than by commutation which is very good even to 90 per cent. below synchronism. In the higher range of speeds the torque increases rapidly for a given brush shift with any slight reduction in speed; consequently a slight change in the counter-torque of the driven device affects the speed but little. The converse is true, however, in the lower speed ranges so that the minimum permissible speed depends largely upon the torque characteristics of the load.

Efficiency and power-factor curves for a PCS motor as compared with similar values for an induction motor with rheostatic control show a material saving in power. Furthermore while the power factor of the PCS motor is lower at low speeds yet the apparent efficiency—that is, the product of efficiency and power factor—is much better at all speeds for the PCS than for the induction motor.

Unfortunately space prevents an adequate description of the PCR speed-regulating sets as applied to fan drives. Such a description will, however, appear in an early issue.

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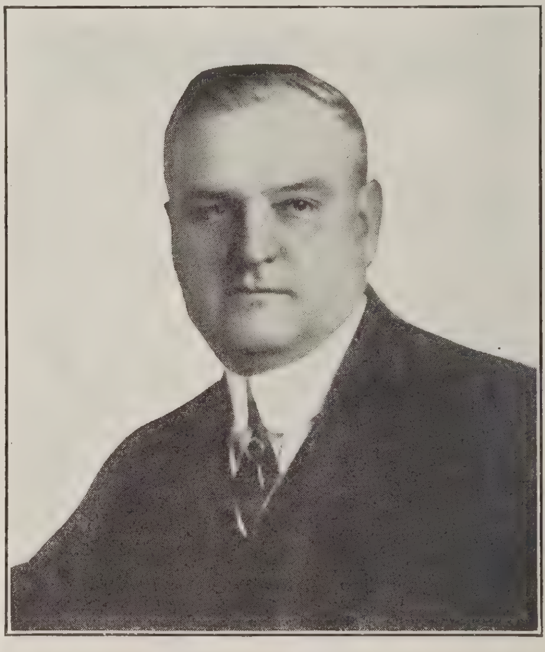
V. H. Manning is New Director of Bureau of Mines

On Aug. 27 President Wilson appointed Vannoy H. Manning director of the United States Bureau of Mines to succeed the late Dr. J. A. Holmes. A short sketch of the life and work of Mr. Manning is therefore interesting to the coal industry at the present moment.

Mr. Manning was born at Horn Lake Depot, Miss., Dec. 15, 1861. His father, Vannoy H. Manning, Sr., represented the Second Mississippi District in Congress.


VANNOY H. MANNING

The new director of the mining bureau is a graduate of the University of Mississippi, from which institution he obtained the degree A.B. He is married and has two children.

Mr. Manning is a member of the American Institute of Mining Engineers, the Washington Society of Engineers, Cosmos Club, National Geographical Society and the Delta Kappa Epsilon Fraternity. He is also a member of the Home Club of Washington, the Trowel Club and the Mississippi Society of Washington.

For more than 20 years Mr. Manning has been engaged in technical and scientific work under the Department of the Interior. From 1885 to 1910 he was engaged as a civil engineer with the United States Geological Survey, which work required his attention in nearly every state of the Union. In addition to his scientific work Mr. Manning has held a number of important administrative positions in the Government service.

When the Bureau of Mines was established in 1910 he was appointed to an administrative position in the bureau by Secretary Ballinger, and on Jan. 1, 1911, was made assistant director. In January, 1914, Dr. Holmes, who at that time was director of the mining bureau, was compelled to leave Washington and relinquish the active directorship of the bureau. At this time Mr. Manning was placed in immediate charge of the work, and from that time to the present he has served as acting director of the bureau.

During his service with the Bureau of Mines Mr. Manning has had charge of methods relating to appointments, expenditures and the conduct of investigations, loyally supporting Dr. Holmes in every effort to make the bureau of great service to the mining fraternity. Mr. Manning's attention to the details of the bureau enabled Dr. Holmes to devote his time to larger matters of policy and to the coördination of the work of the bureau with that of other Governments and private institutions whose efforts have been along lines of safety and efficiency in mining.

There is no doubt that the appointment of Mr. Manning to the directorship of the mining bureau is well deserved and will meet with the general approval of coal-mining people. His long years of service in Government administrative work and his popularity with his associates in the bureau and his friends outside qualify him to fill with entire satisfaction the important position to which the President has appointed him. The coal industry congratulates Mr. Manning on his advancement and assures him of its undivided support.

Production of Coal in 1914

The production of coal in the United States in 1914 was exceeded by that in only two previous years—1912 and 1913. In 1914 the total production of anthracite and bituminous coal amounted to 513,525,477 short tons, valued at $681,490,643, according to C. E. Lesher, of the Geological Survey. In 1913, the year of greatest production, the total was 569,960,219 short tons. In 1914 the value of both bituminous and anthracite coal decreased slightly more than the tonnage, but the decrease in anthracite, the more valuable output, was slight.

The production of anthracite in Pennsylvania decreased from 81,718,680 long tons (91,524,922 short tons), valued at $195,181,127, in 1913, to 81,090,631 long tons (90,821,507 short tons), valued at $188,181,399, in 1914.

The total production of bituminous coal and lignite decreased from 478,435,297 short tons in 1913, valued at $565,234,925, to 422,703,970 tons in 1914, valued at $493,309,244.

The decrease in the production of anthracite was due in part to mild weather during the winter in the area where it is used almost exclusively for a domestic fuel and in part to decreased exports to Canada.

The decrease in the production of bituminous coal was generally distributed over the country, but there were seven states in which the production in 1914 was greater than in 1913. Two of these states, North Dakota and South Dakota, produce lignite only, and make relatively small output. New Mexico's increase was due to ability to supply markets ordinarily furnished by coal from Colorado, which in 1914 suffered from a serious strike. The other states that showed an increase were West Virginia, Kentucky, Michigan and Oregon. The greatest decrease was in Pennsylvania, where output fell off almost 26,000,000 tons. The most notable decrease was in Ohio, where because of strikes the falling off in production amounted to more than 17,300,000 tons, or approximately half the total output of the state in the year 1913.

Ballads of a Coal Miner—VI

Written Expressly for Coal Age

The Question

By Berton Braley

I WONDER *if a miner guy like me*
Has really got a right to have a wife.
I sure would like to ask my girl; but, gee!—
I ain't got much to offer her in life.

If I spoke true I'd simply have to say,
"I love you, girlie—yes, I do, for fair;
Come be my wife an' share a miner's pay
(Which ain't an awful lot for you to share).

"Come be my wife, an' plan an' scrimp an' save
To keep the wolf from snarlin' at the door,
An' fret each day for fear a fire or cave
Will finish up my shift forevermore.

"Come be my wife—yer home a miner's shack,
The kind you see in every minin' town;
An' take yer chance of strikes an' times that's slack,
An' breathe the coal dust always siftin' down.

"Come be my wife—I'll love you true an' sure,
An' when the babies come I'll love them too;
But probably we'll all be mighty poor
An' have a cruel time in scrapin' through."

It ain't just fair, I know, to ask so much,
An' yet I want her; so I guess I'll try
An' maybe we won't meet hard luck, an' such,
For I might be a pitboss, by and by.

Scientific Humidification

By J. I. Lyle[*]

So far as I am aware no mine has yet been humidified on a scientific basis or in fact in any manner that has been successful. Of those installations regarding which I have accurate knowledge, a few fundamental laws necessary for success have been neglected.

The temperature of a mine is fairly constant, varying with the seasons, so that in winter it is a few degrees cooler than in summer, with but slight fluctuations from day to day or even from week to week.

Generally a mine has sufficient humidity during the summer months, because its temperature is much below that of the outside atmosphere. In winter, however, when the outside air carries but little water vapor and the mine temperature is much higher, the relative humidity is necessarily low.

In order that the air used for ventilation may be able to carry sufficient water vapor to humidify the mine, it must be heated, either by its contact with the mine walls or artificially. The temperature to which it is heated must be at least that of the dew point desired.

Take a mine, for instance, with a temperature of, say, 60° F., where a humidity of 80 per cent. is desired with the outside air at 20° F. and containing 1 grain of vapor per cu.ft. Air at 60° F. and saturated carries 5.75 grains per cu.ft. With 80 per cent humidity, therefore, each cubic foot would have to contain 80 per cent. of 5.75, or 4.6 grains. Now saturated air at 54° F. will just hold 4.6 grains per cu.ft. It is evident from this that it is necessary that the air should not be less than 54° F. when the additional water vapor is added. If at any lower temperature it could not possibly hold the required amount of vapor to give the 80 per cent. humidity.

It must be borne in mind that water cannot be evaporated unless heat is added; or to state it in another way, if water is caused to evaporate in the presence of air without heat being applied, the air will be cooled 8° F. for every grain of water evaporated per cubic foot.

This being true, if the air entering the mine at zero is raised to a temperature of 54°, the only way the necessary moisture can be added would be by blowing steam directly into it. It is well known that the introduction of steam directly into the air current without the production of fog is a most difficult matter, if it may ever be said to be successfully accomplished.

With the case under discussion, with the incoming air containing 1 grain of vapor per cu.ft. it would be necessary to add 3.6 grains per cu.ft., which if done without adding heat, as explained, would cool the air to approximately 28° F. To counteract this cooling effect we could heat the air to 82° F. and then bring it in contact with atomized water sprays and add the 3.6 grains per cu.ft., and as a result of the evaporation it would be cooled to 54°. At this temperature of 54° the air would be saturated, but as it traveled through the mine and its temperature was raised to 60° the humidity would be lowered to 80 per cent. Such a system properly installed would give good results without any fog or other objectionable results. A simpler and more practical method is to first pass the air used for ventilating the mine through a humidifier, where its temperature is raised and the necessary amount of moisture is added simultaneously. Such a machine is now being adopted in textile mills for cooling and humidifying the air.

Here the air passes through a dense and finely divided water spray, where it is saturated. The water used is circulated by means of a centrifugal pump and is heated by the introduction of exhaust steam. Eliminator plates at the outlets are used to separate the surplus water from the air, so that the air is left perfectly free of any fog or other small particles of water that have not been evaporated. Because of the recirculation of the spray water employed by this machine, the amount of water required is small and is equal to that evaporated. This would never exceed 1 gal. for each 12,000 cu.ft. of air used.

The exhaust steam required to heat the spray water (which in turn would heat the air to 54° F.) would be 1½ lb. per 1000 cu.ft. of air handled. Of course, with a large ventilating fan this amounts to considerable steam, but in most mines there is sufficient exhaust going to waste to fulfill the requirements.

To summarize: First, it is necessary that the moisture for mine humidification be injected into the air after its temperature has been raised to approximately that of the mine. Secondly, this moisture must be added in such a manner as not to cool the air below the temperature required to carry the desired vapor. Thirdly, the injection of steam into the air at or near the entrance of the mine is sure to produce fog and cannot add the amount of vapor required owing to the temperature of the air being too low to carry it. Fourthly, the humidity of a mine can be maintained uniformly at a desired point by a properly designed humidifier, with heated spray water, located at the air entrance to the mine.

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Explosion in Somerset Field

The Orenda mine of the Merchants' Coal Co., at Boswell, Penn., was the scene of a disastrous explosion on Aug. 31. Boswell is located on Quemahoning Creek in Somerset County. A severe explosion killing five men occurred at Orenda No. 2 on Jan. 25, 1909. This more recent explosion caused the death of 16 men, most of whom were foreigners. It is said that, as in the previous explosion, it was gas, not dust, which exploded. There were 300 men working in the mine at the time.

It was hoped at one time that all had escaped, but it was found that the afterdamp had caused 14 deaths. Joe Mantok, however, was apparently killed instantly by the explosion. John Beegle, a motorman, died in a local hospital later in the day of injuries received, and three others who were badly burned are in a critical condition.

The C. F. & I. Co.'s Field Meet

Between three and four thousand coal miners and their families from all parts of southern Colorado attended the first annual field and track meet given by the Colorado Fuel & Iron Co. at Trinidad on Aug. 14. Two thousand miners took part in a parade. Walsen camp won the first-aid contest. The scores of the competing teams were: Walsen 99, Berwind 98, Morley 97 and Cameron 95. The contest consisted of four events.

Extension of Service of U. S. Department of Labor

Perhaps few of our readers are aware that the United States Government, through the Department of Labor, has inaugurated as a part of the Division of Information a country-wide employment bureau. It is the belief of those connected with the work that it will go far toward improving business conditions in the United States.

The underlying principle of the work is perhaps best expressed by the Secretary of the Department of Labor in the following words: "The Department of Labor has established distribution branches throughout the country for the purpose, on the one hand, of developing the welfare of the wage-earners of the United States and improving their opportunities for profitable employment and, on the other hand, of affording to employers a method whereby they may make application for such help as they need, either male or female, citizens or alien residents, and have their wants supplied through said distribution branches."

Comparative statistics show that there has been in some portions of the United States a surplus of labor, while in other portions there is a deficiency. It is believed that this condition will be almost, if not entirely, eliminated by this work. This will appear from the following explanation of the system under which the work is conducted. The United States has been divided into 18 sections, or "distribution zones," as they are called, and in each of these zones an employment office has been opened. These zones in nearly every case have been subdivided and branch offices opened under the jurisdiction of the controlling zone office.

Thus a large number of employment offices have been opened by the Government. At these places the employer who needs help, skilled or unskilled, can secure what he wants without any trouble or expense. No fee is accepted by the Government from those seeking employment.

Every postmaster in the United States is a representative of this employment bureau. At every postoffice will be found, on application to the postmaster, blanks for the use of employers in need of help and for unemployed persons seeking employment. These blanks are transmitted by the postmaster, free of charge, to the proper zone office, where they are registered. Proper help is then selected for the employer, either from applicants residing in the city in which the office is located, or from other applications on file. On the day the employer's application is received by the distribution office, a copy is sent to the Division of Information at Washington, D. C. At frequent intervals these applications are assembled and published in the form of bulletins, and distributed to all distribution offices, thereby making it possible for each office to know where help of any description is in demand and enables that office to furnish the information to anyone looking for work or workmen.

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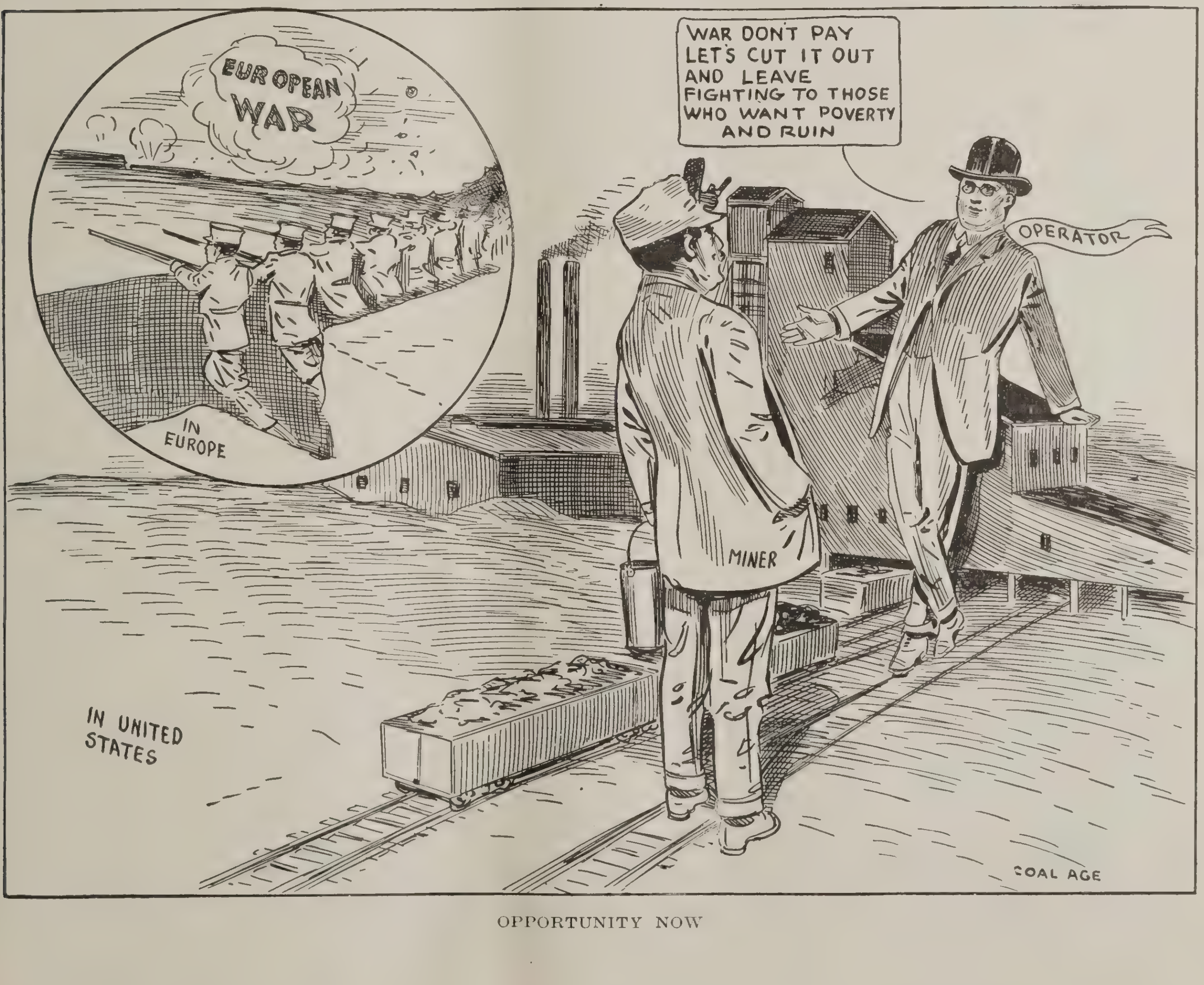
EUROPEAN WAR
IN EUROPE
WAR DON'T PAY LET'S CUT IT OUT AND LEAVE FIGHTING TO THOSE WHO WANT POVERTY AND RUIN
OPERATOR
MINER
IN UNITED STATES
COAL AGE

OPPORTUNITY NOW

Economy in Ventilating Mines With Purchased Power

By Thomas A. Mather*

SYNOPSIS—The use of purchased current has brought to the attention of many coal mine officials leaks in power consumption before unnoticed. Particularly in opening new mines, money may be saved by installing temporarily small fans and motors of a capacity sufficient for the immediate needs of the development, putting the permanent fan in place only when the mine has been brought practically to its capacity of production.

The advent of central power plants, which have demonstrated their ability to furnish power cheaper than it can be made in small quantities, has forced the consumers of current to practice more rigid economy. The receipt of the monthly statement from the power company, with the paying out of hard cash for the amount of power used, has opened the eyes of power users to the necessity of installing the most efficient electrical machinery in order to slow down the wattmeter as much as possible. This is also true of the companies that generate their own power at central plants.

Coal companies have always practiced economy in the making and the use of power (or at least they have thought so) even when they were most extravagant. It is not many years ago that they thought it economical to use the cheapest kind of steam boilers, regardless of their efficiency, because they got the coal at first cost. When they began to charge their power plants with the market value of the coal consumed they saw the falsity of their old ideas of economy, and today the mines are equipped, except in rare and isolated cases, with the most improved and efficient type of steam boilers and power apparatus.

A gradual change is taking place with the coal companies that are using purchased power. Since they are buying power their attention is turned toward equipping their mines with the most economical and efficient electrically driven mechanical devices. Yet after all this is the same old economy of power clothed in a different garb to suit the changes and varying conditions through which we have passed.

Minimum Current Consumption Is a Problem

The most difficult problem to solve at a new mine where purchased or central station power is used is that of the fan to furnish adequate ventilation with a minimum consumption of current.

The old idea was to install as soon as the mine was opened a ventilating fan large enough to provide a sufficient quantity of air for the mine when it had reached its maximum output of coal and the highest water-gage or pressure on the ventilation. Take for illustration a modern mine which will eventually require from 150,000 to 200,000 cu.ft. of air per minute with a water-gage of from 2 to 2½ in.; a fan to produce this quantity of air with reversible steel casing, together with the foundation and installation, will cost from $5000 to $6000 and will require an electric motor of from 100 to 125 hp. for driving.

A new mine will not require this amount of air until it has been developed to its maximum output, which may require several years to accomplish, and if the fan is slowed down to produce 50,000 cu.ft. of air, which quantity would be ample for the first or possibly the second year, the efficiency of the fan and motor would be only about 20 per cent.

Under these conditions it is almost prohibitive to use a large centrifugal fan until the mine is sufficiently developed to require at least 100,000 cu.ft. of air per minute, while the greatest efficiency would be obtained when the fan was producing its maximum quantity (150,000 to 200,000 cu.ft.) with a 2- or 2½-in. water-gage.

In order to get away from this enormous loss of power, a disk type of fan could be used to good advantage in ventilating new mines with purchased power during the preliminary work of opening and until the mine had been developed to such an extent that it required a volume of air in excess of from 80,000 to 90,000 cu.ft. per minute. A disk fan capable of producing from 70,000 to 90,000 cu.ft. of air per minute while the airways are short and the pressure low can be bought for one-sixth to one-eighth the cost of a 16-ft. centrifugal fan and can be operated with less than one-quarter the power that a larger fan would require in order to produce the same quantity of air.

Money Saved by Discarding Large Fan

I have in mind a new mine which was opened about 2 years ago. A 16-ft. centrifugal fan was installed and fitted with a 100-hp. motor. When run at a speed to develop about 65,000 cu.ft. of air per minute, the cost of the power consumed was about 75c. per hour, or $18 per day. This is at the rate of 365 times $18, or $6570 for a year. This fan was replaced by a 6-ft. disk fan, which is still in operation and developing 65,000 cu.ft. of air per minute with a ½-in. water-gage, and the actual cost of operation for one year was $1055.02—less than $3 per day, against $18 per day for the centrifugal fan. This means a saving in one year of $5514.98. In other words, the cost of the centrifugal fan has been saved by the use of the disk fan in one year. The 6-ft. disk fan is now working at its most efficient point, but I see no reason why a larger disk fan, one capable of producing from 80,000 to 85,000 cu.ft. of air per minute with a 1-in. water-gage, cannot be used while the airways are comparatively short and the resistance low.

When purchased power is being used there are a number of things to be carefully considered in determining the size of fan and motor to provide the ventilation during the opening and developing stages of a new mine. The rate of development and number of persons who can be employed from time to time will determine the quantity of air required.

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*Inspector of Mines, 18th Bituminous District of Pennsylvania.

It is most economical, of course, to have as near the right size of fan and motor as possible so that each will be working at nearly its maximum and most efficient and economical capacity. Where conditions will remain nearly the same over a relatively long period of time, perhaps several years, as concerns the quantity of air required and the water-gage developed, the right size of fan and motor can readily be determined. But in new mines the quantity of air required and the mine resistance change so rapidly, owing to the steady increase in the number of employees and the constantly increasing length of airways, that a fan and motor of the right size are good for only a short period of time.

It Is Important That the Motor Should Be of Proper Size

The size of motor should be given careful consideration. The loss in a 100-hp. motor is about 10 kw., which means that the losses in a motor of this size operating a fan continuously for 30 days will be 7200 kw.-hr. With power at the rate of \$0.02 per kw.-hr. this amounts to \$144 per month. In a 10-hp. motor the losses would not be over 2½ kw., or 1800 kw.-hr. in a month, amounting to \$36. This fact alone will justify the use of a motor of nearly the proper size.

In order to save the losses due to an oversized motor the best arrangement to ventilate a new mine would be to put in a medium-sized fan and drive it with a single-speed motor of sufficient capacity to operate the fan for about 6 months. A larger motor could then be used which would run the fan at its maximum capacity, which should be reached in another 6 months. The speed of the fan necessary to increase the quantity of air from time to time could be accomplished by changing the sizes of the pulley. A second fan could then be installed of sufficient capacity to provide ample ventilation until the mine is developed to nearly its maximum capacity, the quantity of air being increased as before by changing the size of the pulleys. By this method an enormous saving in power bills can be effected by the coal company before it is necessary to install a large permanent ventilating fan.

The type of motor should also receive careful consideration. In direct current variable speeds can easily be obtained which would make it an ideal motor for use on a ventilating fan during the opening and development of a new mine as the speed of the fan could be regulated to produce the required volume of air; but since the power furnished by the power companies is alternating current, motors of this type must be used. So far the various devices to secure variable speed on alternating-current motors are either costly or dissipate considerable power without doing any work, and as economy is the watchword a single-speed induction motor will no doubt be found to be the most economical.

In the future more attention will be given to the size and number of airways in order to reduce the velocity of the air current. High velocities mean high water-gages, which will require larger motors and will increase the power bills.

No matter how small the electrical equipment of a mine may be, if purchased power is going to be used the coal companies should engage the services of a competent mine-electrical engineer to make an estimate of their requirements.

"Extracts from a Superintendent's Diary"

Three weeks have passed since the soul of Arnold Cross passed into the great beyond, but his heartbroken mother seems to be unable to become reconciled to his tragic fate.

I received a letter from her today in which she poured out her heart to me, and the note of hopelessness and despair permeating every paragraph of the letter has had a most depressing effect upon me. The grief and the rebelliousness of the mother are almost too terrible to contemplate.

In her letter she tried to justify her rebelliousness. It seems to her that the awful mining disasters that rob mothers of their sons, sweethearts of their lovers and wives of their husbands are of such frequent occurrence in mining history that the womenfolk of the mines learn to look forward to them as possibilities from infancy and so are prepared for the ordeal if it finally overtakes them. And besides as a result of the numberless disasters of the past, mining villages must be filled with widows and mothers and sweethearts thrown into close sympathy and communion with one another by the memories of their menfolks sleeping the long sleep just over the hill.

It is all very reasonable to her, such possible reconciliation to a fate that has long been feared as inevitable; but she feels that her own case is so different. She had hoped against hope from the first day that her son took up mining that he would give it up in answer to her pleadings, and the terror that haunted her day and night was born of the fear that she might not succeed, but never of impending doom.

The depressing effect of her letter upon me was due to the memories that it inspired rather than to the things actually expressed. Just the single sentence about the sweethearts, wives and mothers drawn together by common sorrow started a train of recollections that reaches back into the first days of my mining experience and is interwoven with each of the years that have passed since then. The heartaches and the sorrows, the sacrifices and the forbearance—how they stand out now in bold relief and testify to the grim fortitude of the miners' women! Sprinkled through all of those years are pictures of homes broken up, families separated and romances shattered. In a twinkling of an eye the plans and the yearnings of years have been set at naught—generally not even time for a last farewell.

Occasionally, however, on a piece of loose rock or perhaps on a trap door, a last wish or a parting message is discovered by the rescue parties in search of bodies. It may be a simple request covering the disposition of scanty worldly possessions, or even keepsakes, or it may be a last declaration of love; but it is always written in a firm, bold hand showing that the writer was not afraid to die, and in his last moments, facing impending death, thought not of himself, but only of those left behind.

Such messages are in themselves pathetic enough; but the real tragedy comes when those who have been left behind attempt to live their lives in keeping with the last expressed wish of a loved one suddenly taken from them—mothers striving to hold their families together after the father's wages have been cut off forever; young girls trying to remain true to departed lovers.

How romantic it all sounds; but in reality the romance became tragedy long before it became a memory.

Reminiscences in Ventilation

By F. C. Cornet*

SYNOPSIS—Early testing of a pneumatic mine-ventilating machine by a committee of prominent French and Belgian engineers. Some amusing recollections. The advent of the Guibal centrifugal ventilator. Description of the pneumatic machine.

In connection with the subject of mine ventilation, I recall some incidents, in my early life in France, that may prove of interest to many who have seen or heard of Combes' "Treatise on Mining," which was published at Liege, Belgium, in 1846. This book was for many years a standard work in Belgium and France and contains much that is of interest at the present day. The author, M. Charles Combes, was an authority whose word was generally accepted as law in Europe on all mining matters.

It is interesting to read the report of a test made on a large pneumatic ventilator that had been erected on the Bois de Saint Ghislain mine near my old home in Belgium. The accompanying illustration, Fig. 1, shows the elevation of this early ventilator as it appears in Combes' "Treatise on Mining," to which I have referred. Similar machines were erected all over the Belgium and French coal fields during the period of 1828-1857, when they were finally displaced by the advent of the famous Guibal ventilator.

The test to which I have referred was made on Dec. 17, 1841, by a committee of prominent Belgian and French engineers, who spent an entire week in the effort to make the test exhaustive in every way. There were of course luncheons and banquets given, without which no decent affair of this kind or any other was ever pulled off in Belgium or northern France.

On the committee were M. Guibal, the Belgian who was soon to give to the world another ventilator that would speedily send to the scrap pile all the pneumatic machines then in use; M. Glepin, a Frenchman who had done much experimental work in an attempt to develop a centrifugal fan that would create a sufficiently high water gage to ventilate the deep, narrow, long and circuitous passageways and workings of the Belgian and French mines; and M. Combes, whom I have mentioned. The results of the tests made on the Bois de Saint Ghislain machine were recorded in due form by M. Glepin, the historian of the committee. Even the luncheons, banquets and menus, the flowers on the tables and the high quality of the wines are appropriately mentioned.

In his account, M. Glepin tells at length how he himself had previously installed two centrifugal fans at this same mine. The first raised the water in the tube to a maximum height of 0.832 in., and in order to maintain this gage he states that it was necessary to run the fan at such a speed that it soon had to be scrapped. M. Glepin then designed another fan to take the place of the one wrecked, and this was run continuously without mishap at a speed of 84 r.p.m., which was incredibly high for those days. At this speed the water gage rose to 1.82 in., which, however, was much too low to encourage the owners of the mine to deepen and develop the workings as they had contemplated doing.

It is certainly interesting to read M. Glepin's opinion of centrifugal fans, which was based on these two unsuccessful attempts to ventilate by this means the mine at Bois de Saint Ghislain. He frankly admits his failure and concludes, "while centrifugal fans will perhaps be used to handle large volumes of air at low pressures, they will never be able to create the high water gages necessary for the efficient ventilation of the deep mines of Belgium and France." He therefore advised the operators at this mine to install the pneumatic machine shown in Fig. 1, and was unwilling to charge the company a penny for his time and labor, which had resulted only in failure.

But M. Glepin not only lived to see that he was mistaken in his conclusions in regard to centrifugal fans, but he was the first to install a Guibal fan at the Carnieres mine. It may be assumed in truth that M. Guibal, who signed the report of the committee without hesitation (and he never signed anything that he did not believe), had at that time, 1841, no idea of the ventilator that he produced later and which made his name famous the world over.

An Amusing Incident

It was my good fortune to have studied at the School of Mines at Mons, under Combes, Guibal and Glepin. I was therefore well acquainted with these great men. This recalls to me an amusing incident of my boyhood when I was 10 years old and which shows there were also some notable women at that time, one of whom was Mme. Degorge, the owner and active manager of the Degorge Iron Works, where the Bois de Saint Ghislain pneumatic machine was designed and constructed.

She was a Belgian whose father, M. Legrand, had founded the iron works at the beginning of the 19th century, which at his death he left to his daughter, who had married a Frenchman named Degorge, a lawyer of Valenciennes, a city just over the border. The Belgian laws of those days did not allow a married woman to carry on business under her maiden name, which explains why the Legrand Iron Works became the Degorge Iron Works. Mme. Degorge was an intrepid woman and let her husband stick to his law business while she assumed the management of the works on the very day after her father was buried. She kept at it for many years, and few people who had any business with the Degorge works ever knew there was any M. Degorge. My father's home was not more than 500 or 600 ft. from the main entrance to the works.

The incident I am about to relate made such a deep impression on my mind that I shall remember the awe-inspiring Mme. Degorge to my dying day. It happened one afternoon that as I was returning from school this good lady captured me on the highway and carried me bodily to my father's presence and there accused me of playing some especially bad tricks on the works' gatekeeper, a portly gentleman hardly less dignified than his employer. I may say that the woman's act impressed me more deeply than the punishment administered later by my father.

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*Mining engineer, Charleston, W. Va.

Although the pneumatic machine to which I have referred has passed into history, a brief description of its working and capacity will be of interest, as showing with what difficulties those engaged in the early mining of coal had to contend.

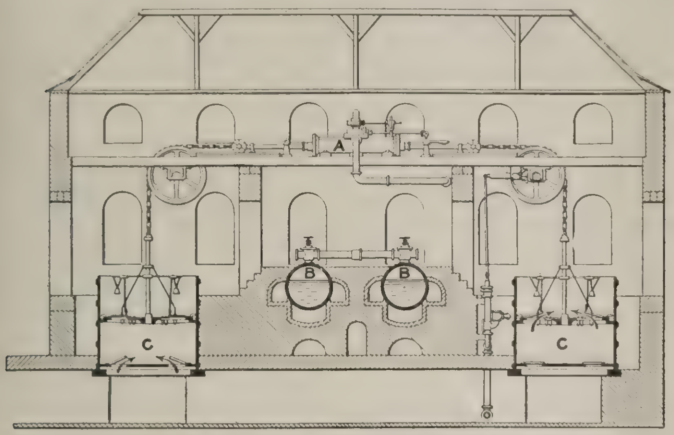


FIG. 1. PNEUMATIC MINE VENTILATOR

Description of the Machine

A brief study of Fig. 1 will serve to explain clearly both the machine and its operation. The figure shows two large vertical cylinders installed in a building which served as an engine room for the operation of the machine. Steam from the boilers entered the steam cylinder *A*, placed on a platform or floor above the boilers *BB* and in a position midway between the cylinders. The two air cylinders *CC* were open at the top, each being fitted with a piston, which is shown in plan in Fig. 2. Each of these pistons contained eight large valves, which were balanced as shown in vertical section in Fig. 1. A similar series of valves was arranged in the bottom of each cylinder. All the valves opened upward, and the action of the machine was exactly similar to that of a large air pump. The two piston rods were connected by a link chain with the piston rod of the steam cylinder. The action of the pistons was alternate, one rising as the other fell. As each piston rose, air was drawn from the mine into the cylinder, through the valves, as shown by the arrows at the bottom of the cylinder on the left. At the same time, the mine air which had been drawn into the cylinder on the right was discharged through the valves in the piston, as indicated by the arrows in that cylinder. It will be observed that one feature in which this machine was seriously lacking was that the mine air was discharged into the building, from which it had to find its way into the outside atmosphere. Beneath the air cylinders was a brick tunnel having an area of 38.64 sq.ft. and a length of 104 ft., extending to the top of the upcast shaft. This shaft was 811 ft. deep and was connected by a succession of tortuous passages or airways having a total length of 5667 ft. and an average sectional area of only 21.11 sq.ft. The downcast shaft was 1004 ft. deep. The sectional area of the downcast shaft was 94.07 sq.ft., while that of the upcast shaft was only 51.28 sq.ft. The surface elevation was the same at both shafts.

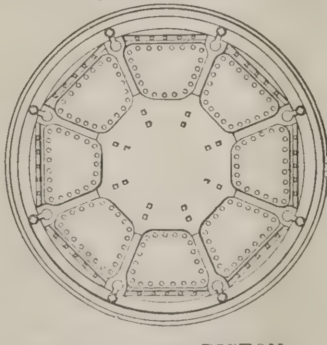


FIG. 2. AIR PISTON AND VALVES

Each air piston had a diameter of 11 ft. 9¼ in. and a stroke of 6 ft. 4 in. and made 12.8 double strokes a minute. At this speed a calibrated anemometer showed an air volume of 11,775 cu.ft. per min. The water in the gage oscillated at each stroke of the piston in a remarkably uniform manner from 2.308 in. to 8.724 in. This made the average water gage 5.516 in., and the power on the air was therefore $5.516 \times 5.2 \times 11{,}775 \div 33{,}000 =$ say 10 hp. Since the brake horsepower of the steam engine was 24.93, the mechanical efficiency of the apparatus was $10 \times 100 \div 24.93 =$ say 40 per cent., which compared very favorably with the efficiency shown formerly by the centrifugal fans—namely, 27 and 29 per cent. respectively.

Total Cost of the Installation

The expense of installing and operating this machine was enormous, especially when considered in respect to its small capacity for handling air. Following are some of the items showing the expense attending the construction, installation and operation of the machine:

The bill paid the Degorge Iron Works for the construction of the machine, boilers, piping and accessories complete was $8497.20. The cost of the installation, including the building having a slate roof, a 50-ft. smokestack and a brick tunnel beneath the building connecting with the upcast shaft, was $4210.24. This made the total cost for the construction and installation $12,707.44.

A record was kept for five years, showing the expense for continuous operation night and day, except five hours on Sunday when the machine was not in operation. This record showed that the annual cost to operate the machine was $2581.45, to which should be added for interest on the investment 6 per cent. and for depreciation 5 per cent., making a total of say $4000 a year for operation and maintenance. Following are the details of this average annual expense:

Wages, day time, one man at 50c. and one at 40c., $328.50; wages, night time, one man at 50c., $172.50; slack coal of inferior quality, 1642.5 tons, at $1 per ton, $1642.50; green soap to grease the pistons, 2422 lb., at 7c. per lb., $169.54; oil and tallow, $128.20; repairs, $140.21; making a total of $2581.45.

This expenditure for ventilation would at the present day be prohibitive in coal mining. Based on the circulation produced, the expense of operation and maintenance would be practically 92c. per 1000 cu.ft. of air per min.

Coal Mining in Spitzbergen

It is reported, says E. W. Thompson in *Commerce Reports,* that a Norwegian syndicate has purchased some coal-mining rights in Spitzbergen for about $300,000. Although Spitzbergen is one of the northernmost points of land in the Arctic Circle, navigation is possible there during a few months of summer.

Coal is becoming increasingly difficult for neutral European countries to obtain because of the employment in military service of many of the coal miners in England and Russia. It may therefore become profitable to obtain coal from points hitherto considered inaccessible.

The Labor Situation

SYNOPSIS—A strike in the spring hardly seems probable owing to the long period of slack work, the lessened demand for coal and the straitened funds of the union. The leaders seem to realize this fact. Destitution due to slackness of work is creating much uneasiness in Ohio and Illinois. The Industrial Relations Commission reports on the Colorado strike.

President John P. White, of the United Mine Workers of America, is talking preparedness and peace, and well he may emphasize the latter, for times are not propitious for a general strike, and he undoubtedly knows it. It is of course hard to know what will happen. The increase in wages which the machinists and oil men are receiving tends to make the miners anxious for a larger wage. The developments in the United Kingdom are also not without influence, and the cost of living as affected by the war also furnishes a reason for an increased remuneration. The miners are also anticipating in the anthracite field that they will receive a part of the income provided by lower freight rates should the price of anthracite in the market be sustained.

All these things tend to make the miners discontented, and the leaders naturally are afraid that they will get out of hand and forget that there are no resources available for a long struggle. The merchants in the anthracite region are preaching peace. They realize that the $2,300,000 weekly distributed by the coal companies is the lifeblood of their trade, and they are quietly urging a peaceful settlement. The Wyoming and Lackawanna region distributes $1,380,000, the Lehigh region $300,000 and the Schuylkill region $620,000 weekly.

These figures do not represent the whole loss that the field may sustain in case of a shutdown, because if the mines are not working the railroads will be idle also. The business men are afraid that if the winter is mild, the heavy stocks on hand will be sold in the spring whether a strike occurs or not, and business will not be any too brisk.

Destitution in the Hocking Valley

The situation in Ohio meanwhile is not bettered. The appeals for food and clothing for the miners have fallen on deaf ears. The people of Ohio are disposed to blame the miners and would rather give to men who are deprived of any kind of a living rather than to men who are idle because they are haggling or have been haggling for a price.

In the Hocking Valley 2000 miners are idle in the specific localities where appeals have been made for help. Only $6000 has been furnished to the Ohio National Guard for disbursement, and supplies have been purchased by that body for which $2000 is still owing. Adjutant-General Houet estimates that $600 worth of supplies are needed daily to provide adequately for the emergency. Unless winter brings the opening of mines now closed, the outlook will be desperate for the men who are at present idle.

In Illinois, Duncan McDonald, the secretary-treasurer of District No. 12 of the United Mine Workers Union, which covers that state, has issued a statement that 50,000 Illinois miners are out of work and thousands more work only one day a week. He says mining conditions are worse than ever before in the history of the industry in that state, and that the prospects for the winter are worse than they were at this time last year. Of the 286 local unions in the state, 89 have been out of work from a month to six months during the past half-year. In the other 200 locals, the work has been slack and men were lucky to get two days a week. About 16 mining concerns in the state have gone into bankruptcy during the year. One, at Benton, McDonald says, owed the miners $40,000 when it failed. In all, the miners have lost $100,000 in wages through mining-company failures. He says that conditions in nearly all the states are the same and that the nonunion miners in West Virginia are the only ones working full time.

The West Virginia operators are preparing to meet such assaults in a paper known as the "West Virginia Mining News," published by Wightman D. Roberts, of Huntington, the author of the pamphlet entitled "The Man with a Job," which was recently reviewed in "Coal Age." Karl F. Schoew, formerly a mine inspector in the Fairmont region, a contributor to the columns of this paper and now a coal-land broker in Huntington, will collaborate with him. Roberts was at one time editor of the "Appalachian Mine Record,' of Roanoke, Va.

Charles J. Albasin, of Bridgeport, Ohio, president of the eastern Ohio miners (subdistrict No. 5 of District No. 6), has denied that he is willing to accept an offer to succeed John Zalenka, of Brookside, Ohio, recently deceased, as secretary of the Pittsburgh Vein Operators' Association of Ohio. He denies also that the offer has been made.

Industrial Relations Commission Report

The Industrial Relations Commission made its report public on Aug. 24. Frank P. Walsh, the chairman, and the three commissioners representing labor found themselves in accord and signed a common report. These men were John B. Lennon, James O'Connell and Austin R. Garretson. The two commissioners who with Frank P. Walsh were intended to represent the public, John C. Commons and Mrs. J. Borden Harriman, signed a separate report. A third was signed by the three representatives of the employers.

The report of F. P. Walsh and the labor representatives declares:

> Many typical industrial communities present every aspect of feudalism except the recognition of specific duties on the part of the employer. The employees in such communities are dependent on a single corporation or employer for their livelihood. Furthermore, the employer in many cases controls the social and political life of such communities, either by the complete absorption of local political powers or by domination of the local authorities.
>
> The fundamental rights of citizens in such communities are as a general rule seriously abridged if not actually denied. Among the rights most seriously violated are freedom of speeech and assemblage and the use of public highways. In some cases, as, for example, in Colorado, employers in such communities have assumed to usurp the function of the Federal Government itself in the issuance of money orders, and have not only denied employees access to the post office when located in their company stores, but have opened and otherwise interfered with the mail directed to the employees.
>
> The most extreme form of domination and control exists in what are known as "closed camps," where the employer owns all the land upon which such camps are located, and because of this private ownership, not only exercises control over the local government, but dictates arbitrarily who shall be permitted to come into or pass through such communities.
>
> It is suggested that the commission recommend:
>
> The enactment of appropriate state legislation providing that where communities develop, even upon privately owned land, the powers of the civil government shall not be interfered with, nor shall the rights of access to the residence of any person be restricted, nor shall the rights of persons to come and go unmolested, to speak freeely and to assemble peacefully be interfered with or considered to stand upon a different basis from the rights of persons in other communities.
>
> That the Post Office Department be directed to report to Congress all communities in which the post office is in any company's store or other building operated by an employer or in which the postmaster is a private employer or the agent of an employer.

On Aug. 27 the report of George P. West to the Commission on Industrial Relations was given to the public. It deals mainly with the relation between John D. Rockefeller, Jr., and the strike in Colorado, and puts all the blame for the action taken upon him. Mr. West proves himself a master in abuse and an able lieutenant of Frank P. Walsh.

Governor George A. Carlson, of Colorado, bitterly assailed Frank P. Walsh on Aug. 29, stating that the people of Colorado, who are by no means all connected with the coal business, proved by their votes that they viewed the situation very differently from Walsh. He has since stated that the United Mine Workers of America has conspired to prevent the recruiting of the militia and has employed detectives for that purpose.

Welsh Strike Still Threatens

On Aug. 26 a thousand Welsh coal miners went on strike to protest against the arbitration ruling of Walter Runciman, of the Government Board of Trade. The trouble spread till 30,000 men were idle, and it was feared at first that all the 200,000 men employed in Wales would go on strike. The leaders appear to have tried to keep their men at work, but their endeavors were without avail until certain concessions were made on Aug. 31.

Apparently the main troubles were the exclusion of the surface workers and engineers from the same war bonus granted the miners and the limitation of the bonus to the continuance of the war. It is said that the mine owners have agreed that, while Runciman's award shall be allowed to stand, they will undertake to conclude a supplemental agreement which will give the engineers and surface workers what they demand. Unfortunately, however, on Sept. 1 the South Wales miners voted not to accept this understanding. Contrary to expectation they insisted that the war bonus be put in operation from July 22 instead of Aug. 21.

Use of Briquettes in the Pacific Coast Markets

Owing to the fact that screenings are a drug on the market, briquettes have played no inconspicuous part in the Pacific Coast trade, but so far have not been a success. One important plant was that of the Western Fuel Co. This concern had some time ago about 6000 tons of anthracite screenings on hand and briquetted some of these. They then curtailed the importation of anthracite and sold a great part of their briquettes. They have, however, quite a tonnage left, which is deteriorating. The plant has never briquetted Wellington screenings, and it has now been put in the scrap heap.

The brown lignite of the Ione Coal & Coke Co., which is very much similar to German lignite, is being experimented with for briquetting purposes. A German plant and system are being installed, and briquettes in the form of the German brown coal briquettes will soon be put on the market by that company.

In regard to the briquettes being made by the Pacific Coast Coal Co., it is said that 1200 tons were brought to this market. A report on them could not be obtained, but they are expected by the trade to be put on the San Francisco market.

A briquette known as carbon fuel is also being tried out in this market. This briquette is made by the Pacific Gas & Electric Co. at their Oakland plant. It is made from the residue of oil, which should be very dry before being used, and is broken up to a fine powder. No binder is used. Although a strong pressure is exerted on the briquettes, they are very soft when they come out of the machine and must be handled carefully. However, they harden after a while, and in fact become very hard under certain conditions. Wet winter weather is not favorable for that process, however, and the sale of the briquettes has therefore had to be stopped, as they were breaking up too much in this weather, and no sufficient dry stock has been kept on hand.

When burning, this fuel has an odor, and it smokes at first and then glows. It has no flame and is used mostly in furnaces. Its ash content is very low and carbon very high, the producer claiming over 15,000 B.t.u. It is an excellent steam fuel and will have to be taken into consideration as an important competitor in the Pacific Coast markets. At the present time, however, it is still in the development stage and is being experimented with.

American and Other Coal in Peru

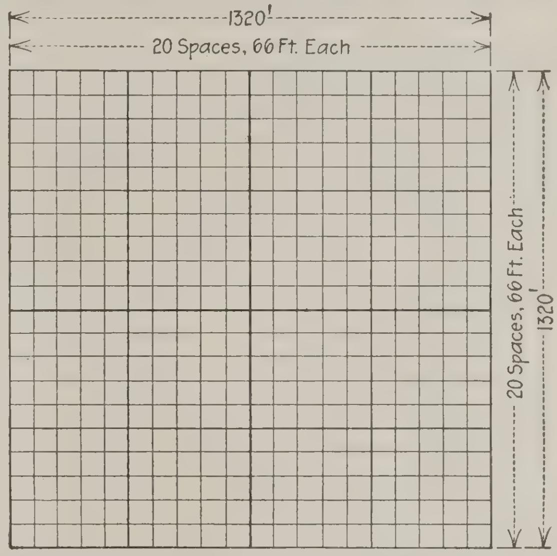
The importation of coal into Peru, says a supplement to *Commerce Reports,* fell from 150,660 tons in 1913 to 139,382 tons for 1914, which decrease is attributed largely to the embargo on shipping on this coast during the latter part of 1914 due to the presence of belligerent warships, the prevailing high freight rates from both American and European ports and to the establishment of modern coaling facilities at Panama, where many of the West Coast steamers now coal rapidly and at reasonable rates. The imports of coal from the United States increased from 11,461 tons in 1913 to 15,802 tons in 1914, but the imports from Germany fell from 32,696 to 12,044 tons.

The large proportion of imports from Great Britain, being 86,222 tons last year in comparison with 78,958 tons in 1913, may be attributed to the old trade that has existed between the West Coast of South America and Wales for many years, the product being brought out in sailing vessels or tramp steamers, which usually return with cargoes of sugar, cotton or nitrates from Peru and Chile, and also to the fact that belligerent warships occasionally used these ports for coaling purposes.

Obtaining the Approximate Area of Irregular Plats

By F. F. Jorgensen*

A plat of squares made on tracing cloth or paper, as in the accompanying illustration, is a convenient means to employ in obtaining the approximate area of irregular pieces of territory. This plat represents 40 acres on a scale of 200 ft. per in. and is divided into 400 equal squares representing one-tenth of an acre, or 4356 sq.ft. each. These small divisions are 66 ft. square, but they may be made as small as desired when it is necessary to obtain results closer than one-tenth of an acre.



PLAT FOR OBTAINING AREA OF IRREGULAR PLOTS; EACH SMALL SQUARE = $\frac{1}{10}$ ACRE; SCALE 1″ = 200

If these divisions be reduced to 33 ft. on the side there will be 1600 equal squares in the plat representing the 40 acres, and each square will represent one-fortieth of an acre, or 1089 sq.ft. With 20-ft. divisions representing .009+ acre, or 400 sq.ft. each, there will be 4356 equal squares in the plat. With divisions of the last-mentioned size very accurate results can be obtained.

This plat is convenient to use with mine maps in estimating the acreage worked out each year. The method of using is as follows: Lay the plat on top of the map, making the side lines of the plat correspond with the 40-acre lines on the map. Then count the number of squares that cover the territory the area of which is required. To aid in this counting the lines dividing the plat into quarters and sixteenths are made heavier than the others. For old maps or ones with light and indistinct lines it is necessary to make the plat on extra-transparent tracing cloth or paper.

The plat may be made any size desired, but for maps made on the scale of 100 or 200 ft. per inch I have found the plat representing 40 acres the most convenient.

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Mining Coal in Italy

The only mines of importance in this district, says Consul F. T. F. Dumont, of Florence, Italy, in *Commerce Reports,* are those of coal, sulphur and petroleum. Even these mines are extremely small compared with similar mines in other countries.

The coal deposits occur principally at Castiglia, near San Giovanni Valdarno, Province of Arezzo, and are estimated to contain approximately 17,000,000 long tons of lignite coal known as "lignite Xisolide." It is likely that a more thorough investigation of the limits of the field would materially increase this estimate. Outcrop due to wash occurs in a few places, but generally speaking, and where the principal mine is located, the top of the deposit is about 300 ft. under the surface. The vein averages 75 ft. in thickness and is mined in 6-ft. benches. Speaking in a geological sense, the coal is very young, having scarcely passed beyond the stage of wood. Trunks of trees are found the wood of which shows considerable resiliency. About 35 per cent. of water is found in the coal mined. Interspersed throughout the deposits are infiltrated deposits of clay running from 1 to 6 in. in thickness. The coal when burned gives a large quantity of ash even up to 50 per cent. The part most resembling wood is, after drying in the yards, sold in neighboring cities and villages for heating and cooking purposes, its cost delivered f.o.b. Florence being about $2.70 per long ton.

A large plant for furnishing electric power and light has been erected at the mine mouth which utilizes the poorest coal and waste. The plant is well and economically arranged and is equipped with the most modern machinery. The amount of power used for the machinery of the mining operations is small. The coal is very soft and the use of cutting or drilling machines is impossible. It is broken down by hand and loaded in small mine cars. An inclined plane runs from the surface to the level, and after a sufficient number of cars are collected at the foot of the incline, they are coupled together and hauled up the incline by cables operated by electric motors. The cars are either unloaded in the yard where the coal is spread for drying, or else unloaded directly into railway cars. No other machinery is used in the mine except a few pumps operated by electric motors. The 700 miners turn out 1200 tons per day of 10 hours and receive from $0.58 to $0.96.

The Coal Industry of Belgium

In 1913 the total production of coal in Belgium, says *Commerce Reports,* was 22,841,500 tons. During the first six months of 1914 the production was normal. During the last six months the production has been about half the normal. About 105,000 miners have been at work since the war broke out, as compared with 147,000 usually working in the mining districts of Belgium. The whole industry stopped in August when the Germans entered these districts.

In the province of Liege work first stopped in August. It was resumed partly in September, and the production went up progressively as follows: In October it was 25 per cent. of the normal production; in November it was 30 per cent.; in December, 40 per cent.; in January, 45 per cent.; in February, 50 per cent.; and in March, 50 per cent.

In the province of Hainaut, the Mons and Charleroi districts are to be considered. The work in the Mons district was especially affected from Aug. 23 to Sept. 15, when fighting was going on in these parts. Work was resumed in November; 80 per cent. of the workmen began work, and in order to employ them all, they were divided in shifts working alternately every two days. The production was 45 per cent. of the normal production in November and 50 per cent. in December. In the period January to March, 1915, 65 per cent. of the normal production was attained with the same number of workmen. In the Charleroi district the population was much affected by the war. Only 60 per cent. of the miners resumed work in November, turning out 30 per cent. of the normal production. Since December the situation in Charleroi has improved a little. All production and all stocks were put under the control of the German central bureau at Antwerp. This bureau has power to sell to manufacturers, owners of works, dealers, etc., at prices fixed by itself. The proceeds of the sales are handed to the mine owners after the deduction of a commission to cover expenses incurred by the central bureau. All contracts made before the war or since the occupation are void, and mine owners cannot be considered liable to damage for nonexecution of such contracts. In special cases contracts may be executed with the authorization of the central bureau. This bureau regulates production, sales and prices over all the occupied parts of Belgium. Coal is in little demand now except for domestic consumption.

The Song of the Mine Fan

By Michael Bernard

CASED *in a shell of steel*
Over the uptake shaft,
Here thru the livelong day to wheel,
Causing the upward draft;
Sucking the moist, dead air
Out from the nether murk
Into the noonday's brilliant glare—
This is my ceaseless work.

Into the gloomy pit,
Off through heading and drift,
Sending the air by many a split
Down to the working shift;
Sweeping the gas away,
Carrying off the damp,
Making a clearer, brighter ray
Shine from the miner's lamp.

Turning of arm and blade,
Tireless, swift or slow,
Sending the breath of life to aid
Those in the mine below;
Whirring and pulse and purr,
Surge like a surfy sea,
Keeping the clean, sweet air astir—
This is the work for me.

Editorials

The Purpose of Injunctions

An injunction is a legal means of preventing a wrong for which the law itself cannot or may not be able to furnish a remedy if once the wrong is committed. It was never looked upon as a menace by any of the public till it was applied in labor disputes, and then it appeared to the enjoined as a peculiarly iniquitous proceeding.

Applied to a capitalist or a corporation—and frequently was it so applied—its action appeared wholly commendable. Nearly everyone can see why Morgan or Rockefeller should not commit a wrong and escape the law, or why he should not be allowed to perform some improper act which for some reason can never be entirely corrected even though eventually he may be punished for his wrong action. But almost no one is of that opinion with regard to labor. Some in fact believe that labor has the characteristic of royalty—it can do no wrong.

Recently in Charleston, W. Va., certain miners secured an injunction on the Boomer Coal & Coke Co. restraining it from paying the monthly check-off to President Thomas Cairns and Secretary J. M. Craigo of District No. 17 of the United Mine Workers of America. They recognized in the injunction process an opportunity to secure their rights or what they imagined were their rights in the union. The union leaders, they declared, had secured their perpetuation in office by all manner of trickery, and though these officials were exonerated on trial by the executive board, still there was dissatisfaction, and so these men who normally would be the first to denounce restraining court orders became among the first to demand them.

In District No. 9 a similar use of the ancient principle of injunction has occurred. Judge Brumm, at Pottsville, Penn., has issued a permanent injunction restraining the officers of the executive board of the United Mine Workers of America of District No. 9 from suspending Thomas Butler from membership in the Girardville local. The officers had charged Butler with daring to express his opinion. He had criticized unfavorably some mining legislation in which they were interested, and it was alleged that he did so with the object of disrupting the union.

The union officials in Butler's district deny to union men the right of private judgment. Everyone must think or appear to think as they do. And the miners in that district by their supineness to such dictation seem to demand not only that their elected leaders should be amenable to discipline of act and word, which would to an extent be right as they represent them and accept pay for their services, but they require the same of every individual in the union and the right to punish everyone who takes a different view.

The utter dishonesty of the attack by members of the union and by the *United Mine Workers' Journal* on the trustees of the University of Pennsylvania for the discharge of Professor Scott Nearing, a teacher of economics, is made clearly apparent. Nearing was employed to teach; he was not a mere student paying his way, but an official. A certain amount of leeway should be allowed him of course. Perhaps the trustees were wrong in dismissing him; but if they were, their action was far less reprehensible than that of the officials in District No. 9. Surely a mere union member who pays in to the funds of the union has a right to freedom to vote, to recommend and to plead with fellow-members in the organization to which he belongs. To deny his right to membership and to freedom of speech is to deprive him of the most elementary prerogatives of the individual.

The case was clear, and Butler was absolved of the charges by his local, but the district board stepped in and suspended him from membership for six months, adding as a further penalty the provision that he should be ineligible for office for a period of two years. In giving his opinion the judge ruled that criticism of pending legislation is a personal privilege of every man, so long as it is neither libelous nor slanderous.

Butler has announced himself as a candidate for district president, an office to which he has heretofore aspired. It is clear that had he been shut out of the union he could not have run for office and it would have been difficult if not impossible to have compensated him for the loss of the honor he sought as leader of his fellows.

So the courts have appeared—as so often before—in defense of personal liberty. The injunction is the tool of everyone who has both the need for it and a right purpose for its use. It is the tool of labor when labor is right and the defense of capital when capital needs its protection. The recent actions in West Virginia and Pennsylvania well illustrate its adaptability to the cause of freedom and the public good.

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Industrial Relations Commission

This body, which might well be termed the Commission for Disturbing Industrial Relations, has run its evil course. Its cost cannot be limited to the half a million dollars which was actually expended on it. The wages of agitation are immeasurably smaller than the damage it may cause.

The chairman of the commission, Frank P. Walsh, had an excellent opportunity to perform a great service to his fellow-countrymen. It was his role to act as a great father confessor to the industrial public. He could have induced them one and all to acknowledge their petty meannesses, their low aims and their violations of the law. He could in addition to hearing such confessions have carefully staged for the benefit of the public all those admirable actions and worthy intentions which employers, employees and their respective organizations had done.

But Frank P. Walsh had no such intention. He never for one moment forgot he was a lawyer and a politician. It was not his purpose to unveil the whole truth, only to uncover the peccadillos or larger offenses of those who had quarreled with those people whom he regarded as his clients—the few working people who seethe with discontent and revolt, especially that foreign population which believes itself commissioned to regenerate the United States.

The report of the majority of the commission has already been cast in Uncle Sam's ample waste-paper basket, and Walsh himself will soon be in the discard with the document to which he has signed his name. No one can tell why President Wilson appointed him, for the Chief Executive is the very antithesis of Walsh. He believes in seeking for the best in men and advocates always perseverance and fairness. It was a mistake and one which he has doubtless often regretted when he appointed so unfair a man to such a responsible position.

The plea for the confiscation of estates exceeding $1,000,000 which forms part of the Walsh report is one of its most unfortunate features. The most useful fortunes we have are the large ones. An estate worth $1,000,000 drawing 6 per cent. will provide the owner with $60,000. The millionaire can and often does spend that amount of money in luxurious living.

But the man with a larger fortune is physically unable to spend the income on himself. He may spend large sums in building fine residences, but such money is rather an unprofitable investment than an expenditure, as it lasts for more than one generation. But usually he is utterly unable to spend any large part of his income on his follies. Perhaps 1 or 2 per cent. only is so spent. The rest goes back into business, and thus increases the national wealth. Such a fortune is almost as impersonal as if it were public property, and the placing of such an inheritance under trust restrictions, which Walsh deplores, only completes the quality of impersonality.

It is true that the possession of great fortunes does create industrial unrest largely because of the ability of leaders to use them in fanning into flame a spirit of jealousy. Actually the feeling is far more likely to arise from the presence of the merely well-to-do people who, living near the less fortunate, are more likely to arouse their envy. There seems an unfairness also in large inherited fortunes, and these two objections to them are so strong and reasonable that some animosity toward them is to be expected. Moreover, the political and moral power accompanying great wealth is in a degree a menace to our free institutions, and the possession of a fortune not infrequently undermines the character of its owner and that of those with whom he associates.

But if we clip those fortunes off short, as Walsh and his friends would wish, and apply the money to the extension of education, road building, irrigation, reforestation and the development of those other "important social services which should be properly performed by the nation," are we sure that the country will be more effectually benefited than it would be if the owners of that wealth still had it and still realized that it should be put out where it would at least not depreciate in value?

The possible uses of wealth that Walsh enumerates all have a real value, but still they are by no means without alloy. Reforestation has almost never been conducted at a profit in this country. Irrigation has been a sincere source of regret to many who spent their money in it. Road building as conducted has shown itself to be, not an investment, but a perennial tax. Social service means supplying to persons something they will not save for themselves. Even education is often of doubtful advantage, merely unfitting those receiving it for active toil. Perhaps all these might be made profitable, but evidently Walsh is not advocating them for their economic advantage. He makes no attempt to prove that an expenditure of money on them will be industrially productive.

The rich man may waste his money, it is true, in such unprofitable enterprises, but at his own and evident peril, and he seems to realize that fact better than the public. Some day the people may learn a truer economy, but at present investments that no foolish son of a rich man will venture to tackle, much less the astute father of that foolish son, have a great attraction to the national and state legislatures.

Instances of such expenditures are the improvement of the antiquated Erie canal, which will never pay the interest on its cost, however calculated; the construction of public roads, which last two or three years and need rebuilding at the end of that time; the digging of the Panama canal, which does not pay a dividend and may not pay its upkeep; the national expositions, the erection and operation of which possibly do not educate the public in proportion to their expense, and so on. A nation, like a workingman, will of course spend some money unproductively.

But the point is that the rich man is obliged to expend his money economically or lose it. The public does not seem to realize that it is in the same predicament. It is willing to take these accumulations, drag them away from found and developed profitable uses and throw them to the four winds careless of any future crop.

By greed, by cunning, by qualities perhaps which we do not like as well as by diligence, by intelligence, by self-denial and foresight the rich man sees that his goods increase. He is the source of our economic future. Take his money from profitable employment, spend it for him, educate men, if you will without regard to the ability or willingness of the educated to make a return, provide baths, amusements, comforts and what not for those who will not save to buy these things, and what results? The capital saved for future development is expended in gratifying the wish of the moment.

The time is ripe, owing to the war, for the United States to be the leading financial country in the world. But just now it is the most illiberal nation on earth to its railroad and bituminous coal capital if not to some other forms of investment. If in addition it becomes even worse than Great Britain to inherited fortunes it will never be anything else than financially a vassal to countries where profits are permitted—unless a miracle occurs and the lavish American citizens become as frugal or more frugal than those of France and so make up by saving what is denied as profits.

If any confiscation of our American fortunes comes at the behest of our foreign population—O stranger from less happy lands, if you see anything you want don't fail to ask for it!—it is to be hoped that the money will be put or kept in commerce and permanent profitable construction and not into a hundred and one uneconomic purposes which merely serve to allay poverty, but which do not create that power of production which not only relieves need, but actually in perpetuity removes it from all those who will work and save a little.

Sociological Department

Mine-Rescue and First-Aid Meet at Clealum, Wash.

By E. Jacobs*

SYNOPSIS—Another meet showing how loyally the labor unions in Washington are supporting the mine-safety movement, giving time, money and influence to its support. The contest was held on the village street.

The second annual state-wide mine-rescue and first-aid meet in the State of Washington was held at Clealum, Wash., on Saturday, July 31, by the miners and operators of Washington under the auspices of the United States Bureau of Mines, the State Mine Inspection Department and the American Mine Safety Association. The proceedings were under the direction of an executive committee and representatives of the United States Bureau of Mines, but a local arrangement committee relieved the general executive of much of the work of preparation.

INSTEAD OF GOING TO THE BALLGROUND FOR THE FIRST-AID CONTEST, THE WASHINGTON STATE SQUADS USED PENNSYLVANIA AVENUE, IN CLEALUM, FOR THAT PURPOSE

The executive committee consisted of J. J. Corey, United States Bureau of Mines; James Bagley, state inspector of coal mines; Martin J. Flyzik, president of District No. 10, United Mine Workers of America, and D. C. Botting, commissioner, Washington Coal Operators' Association. The United States Bureau of Mines was officially represented by H. M. Wolflin, of San Francisco, Calif., mining engineer, and W. D. Ryan, of Kansas City, Mo., mine safety commissioner. The local arrangement committee consisted of A. A. Batterson, Joseph Parker, J. V. Hoffler, A. W. Hodder, Oscar Haltern, J. E. Morgan, John Lera, Thomas Summerill, Fred Zentner and Elijah Burge. Simon H. Ash, deputy state inspector of coal mines, and David J. Price, engineer investigating cereal-dust explosions, Bureau of Chemistry, United States Department of Agriculture, were the official scorers.

MEET HELD ON VILLAGE STREET

The first-aid contests took place in the morning in the heart of the town of Clealum, a part of Pennsylvania Ave. the full length of one block having been roped off. A good surface measuring 95x25 paces had been prepared along the center line of the roadway. This was watered and rolled. Seats were arranged all around this novel "field" for the comfort of the spectators, of whom fully 2000 were present. Interest was general, and the large attendance, together with the enthusiasm freely shown, gave practical evidence of the growing favor for first-aid work. Many of those competent to express an opinion declared that nowhere else in the Northwest have interest and enthusiasm been so strongly marked and so general as at this state-wide meet.

The gallery erected for demonstrating the explosibility of coal dust was constructed by the citizens of Clealum out of material furnished by the Northwestern Improvement Co., of which C. C. Anderson, of Tacoma, Wash., is general manager.

The two silver cups offered for competition were donated before the annual meet in 1914 by the E. I. du Pont de Nemours Powder Co., with the condition that they should be retained permanently by any team winning them at two consecutive state-wide meets.

Among other donors, District No. 10 of the United Mine Workers of America gave $25 for prizes in the four-man event, and the Clealum local, No. 2512, of the same organization, presented $20 for prizes to the winning teams in mine-rescue and first-aid events. The Roslyn Cascade Coal Co. gave $25 and the citizens of Clealum gave cash to be awarded to the winners. The townsfolk also assisted in other ways. The Clealum Eagles' brass band rendered instrumental selections throughout the morning in town and in the afternoon played at Ball Park, where the mine-rescue events were held.

The following doctors judged the first-aid events: D. O. Kearby, F. W. McKnight and Charles F. Stafford, of Clealum; A. L. McClenahan, of Ellensburg; George H. T. Sparling, of Newcastle; H. J. Davidson and B. J. Lloyd, of Seattle, and J. W. Mowell, of Olympia, surgeon to the Washington Industrial Commission. Dr. W. N. Lipscomb, American Red Cross industrial surgeon, who is engaged in Red Cross work in the state, acted as field surgeon. Dr. Sparling also assisted Dr. Newgard, of Roslyn, in the mine-rescue events, by taking the temperature of the competitors.

FIRST-AID CONTESTS

The actual program of first-aid events was printed, but its contents were not revealed to any but the committee until the teams were on the ground ready to undergo the trial of their skill. It was as follows:

Team Event—Driver is caught between cars and sustains a compound fracture of the left thigh, resulting in severe arterial hemorrhage, and simple fracture of the right upper arm. His right eye is badly bruised and his right ear is severely torn. Treat, improvise stretcher and carry 50 ft. Time, 15 min.

One-Man Event—A man has been overcome by gas. Owing to the lowness of his working place it is impossible to carry him in an erect position. Bear him 20 ft. to a place where the bearer has room to stand upright; then carry him 20 ft. by the "shoulder carry." Perform artificial respiration by the Schaefer method for one minute. Time, 7 min.

Four-Man Event—A miner is rescued after falling into a chute. His right shoulder is dislocated and four ribs are fractured on the right side. He has a severe scalp wound

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*Post Office Box 645, Victoria, B. C.

AFTER THE CONTEST THE FIRST-AID AND MINE-RESCUE CORPS LINED UP AN

above the right ear, with hemorrhage. Treat, improvise a stretcher and carry 100 ft. over an obstruction. Time, 20 min.

Two-Man Event—A man falls on an electric wire, face down, and is rendered unconscious. Rescue, using safety-first methods; perform artificial respiration for two minutes. Time, 6 min.

Three-Man Event—A car runs down a room and catches the motorman. His lower right arm and hand are badly mashed, and severe arterial hemorrhage follows. His left leg is cut and severely bruised above the knee. Treat and load on a stretcher. Time, 15 min.

Team Event—A miner having omitted to timber or take down a piece of cap rock is caught when it falls. His spine is injured, his left foot is badly smashed and right leg is fractured below the knee, his nose is broken and his lower jaw is fractured. Treat, carry 50 ft. under cave which still permits of 3 ft. of clearance. Stand in upright position to show work. Time, 20 min.

Four-Man Event—A miner has been rescued following an explosion and has sustained the following injuries: Burn on back of head and neck, simple fracture of right leg below the knee and compound fracture of the kneecap of the left leg. Treat. Time, 17 min.

The discounts recommended by the American Mine Safety Association were those used. These will be found recorded in the account of the "State-Wide First-Aid Contest in Illinois" in the issue of "Coal Age," June 12, 1915, on p. 1030.

The awards for the team events were as follows: First prize, silver cup, presented by the E. I. du Pont de Nemours Powder Co., American Mine Safety Association medals and $10 in cash; second prize, $10 in cash.

In one-man event: First prize, $3; second prize, $2. In two-man event: First prize, $5; second prize, $3. In three-man event: First prize, $7.50; second prize, $5. In four-man event: First prize, $15; second prize, $10.

In deciding the winners of prizes in the team events, the total number of points obtained by members of a team in all events was taken into account. The scores in the four-man events were added together, and prizes were awarded to the teams making the highest and second score thus figured.

FIRST-AID CONTESTANTS

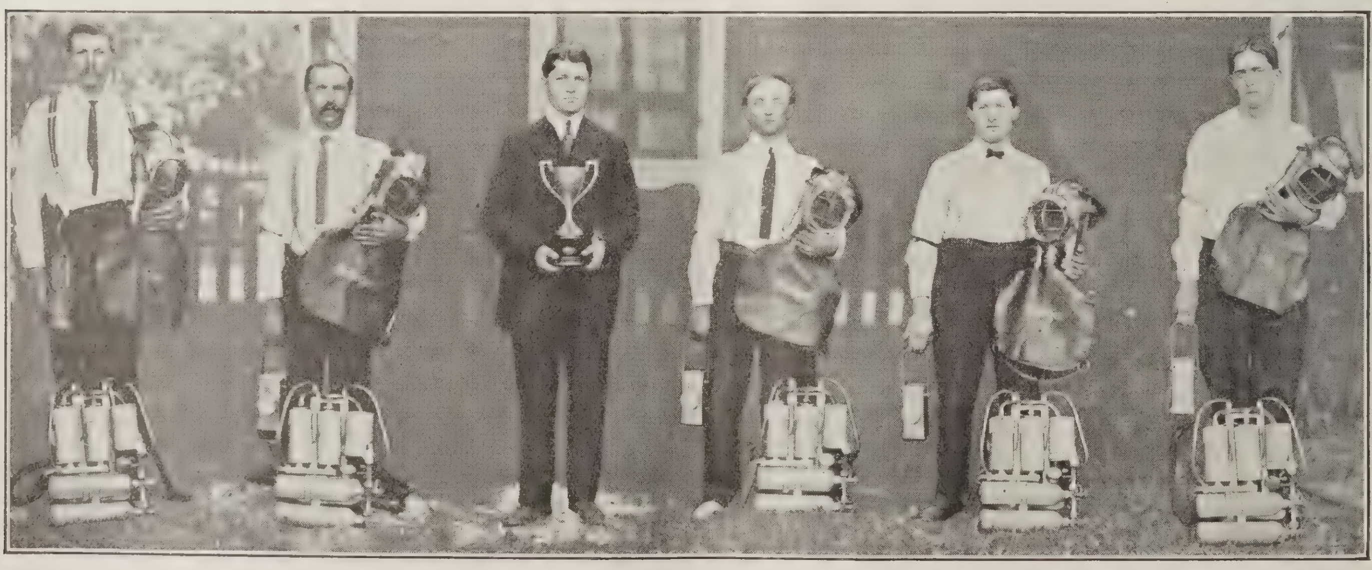
Thirteen teams contested in the first-aid events, as compared with eight in the 1914 competition. These were: Clealum, No. 7 mine of the Northwestern Improvement Co.; Tono, Washington Union Coal Co.; Beekman, Roslyn Fuel Co.; Clealum mine, No. 2 team (N. W. I. Co.); Carbonado, Carbon Hill Coal Co.; Roslyn, No. 5 mine (N. W. I. Co.); Tono, Washington Union Coal Co. No. 2 team; Ravensdale mine (N. W. I. Co.); Roslyn, No. 6 mine (N. W. I. Co.); Black Diamond, Black Diamond First-Aid Association; Roslyn, Roslyn Fuel Co.; Roslyn No. 3 mine (N. W. I. Co.); Clealum, No. 7 mine No. 2 team (N. W. I. Co.).

In the first full-team event Clealum No. 7 mine took first place with 100 points, the Carbon Hill Coal Co.'s team from Carbonado came second with 97 points, while Clealum No. 7 mine No. 2 team was third with 96 points.

In the second full-team event Clealum No. 7 again led with 100 points, but Clealum No. 7 mine No. 2 team made 99 points, while the Carbon Hill Coal Co. scored only 89 points. Thus Clealum No. 7 easily won with 200 points, and No. 2 team of the same mine was second with 195 points, while the Carbon Hill Coal Co.'s team, which had started so well, was third with 186 points.

In the one-man event No. 2 team of the Washington Union Coal Co., the Roslyn Fuel Co.'s team and the Roslyn No. 3 team tied for first place, each obtaining 100 points. In a second contest the Roslyn Fuel Co.'s team received a perfect score, and the Washington Union Coal Co.'s squad was second with 89 points.

In the two-man event the three teams which tied in the one-man event tied again with the Roslyn No. 5 team. All received a perfect score. A second contest gave Roslyn No. 5 team first place with 97½ points and the Roslyn Fuel Co. team second place with 97 points.



RESCUE TEAM OF ROSLYN, NO. 6 MINE WHICH WON FIRST PRIZE FOR MINE-RESCUE WORK AT THE CLEALUM MEET OF JULY 31, 1915

From left to right—Tony Stanfel, captain; Tony Tomatich; J. E. Morgan, instructor; Matt Mohar; William Bedner, and J. M. Boose

WERE PHOTOGRAPHED WITH THE OFFICIALS OF THE COMPANIES INTERESTED

The three-man event was likewise hotly contested though more demerits were scored. Clealum mine No. 2 team received 100 points, but Clealum No. 7 mine, the Beekman team of the Roslyn Fuel Co., the Carbon Hill Coal Co. team, the Black Diamond First-Aid Association and Clealum No. 7 mine No. 2 team each obtained 98 points. A second trial of skill separated the five contestants, but still left two with 100 points—the Beekman team of the Roslyn Fuel Co. and team No. 2 of No. 7 mine, Clealum. These two had again to compete, and the latter won, securing 98 points, while the Beekman team received 5 demerits.

In the first four-man event the team from Clealum No. 7 mine, the Ravensdale team and that of Roslyn No. 6 each obtained 100 points. The Washington Union Coal Co. fell behind, receiving one demerit. Clealum No. 7 mine No. 2 team made only 98 points.

The second four-man event gave three teams a perfect score—the team of Clealum No. 7 mine and No. 2 team at Clealum and No. 2 team of Clealum No. 7 mine. The Washington Union Coal Co. No. 2 team received one demerit. As a result of the two four-man events Clealum No. 7 received a perfect score of 200 points, while the Washington Union Coal Co. No. 2 team tied with Clealum No. 7 mine No. 2 team, each having 198 points. Another contest had to be held, and in this the Washington Union Coal Co. team maintained its score at 198 points, but the Clealum No. 7 mine No. 2 fell back to 196½ points.

As Clealum No. 7 mine team of the North Western Improvement Co. obtained the highest aggregate in all events both this year and last, it was entitled to permanent possession of the silver cup, and the judges made the award accordingly. This team consists of the following members: William Saul, captain; Wilson Clarke, Joseph Parker, Henry Owens, Fred Ashurst and Joseph Andreotty, patient. The team receiving second prize, Clealum No. 7 mine No. 2 team, was composed of Frank Koester, captain, William Clarke, Joseph Hodgson, Isaac McGee, John Stofko and Rudolph Mayta, patient.

MINE-RESCUE CONTEST

The mine-rescue contest was held in the afternoon in the Ball Park, situated a short distance out of the town. A long covered gallery had been erected temporarily for the purpose of this contest and for demonstrating the effect of the use of certain explosives.

The contesting teams in this event each consisted of five men, including the captain. They were all equipped with artificial-breathing apparatus. The event as scheduled was as follows: A mine fire in a side entry is beyond control; the crew will enter and put up a temporary wooden stopping at the entrance. Just as the stopping has been completed, one of the helmeted men is found to have fallen in distress; he is carried to the front of the grandstand, a distance of 50 to 60 yd., and revived. Time, 25 min.

Discounts to be made in this contest were as follows:

Preliminary:	
1. High pulse, for each member	3
2. Failure to remain in smoke room, each member	4
3. Failure to name tests for apparatus, each test	5
4. Apparatus not properly adjusted to wearer	7
5. Loose joint or connection, each	12
6. Breathing bags, flat, each apparatus	8
While Performing Event:	
7. Failure to maintain 2-yd. interval advancing	2
8. Failure to test condition of roof	3
9. Failure to test for presence of gas	4
10. Failure of captain to give command	4
11. Failure of member of crew to obey command	5
12. For breathing external air intentionally	15
13. Failure to protect live men against mine gases	10
14. Failure to complete event in time specified	6
15. Failure to use life line in smoke	8
16. Losing time or doing unnecessary things	4
Total points	100

Seven teams took part in this contest: Carbon Hill Coal Co., Carbonado; Ravensdale mine, N. W. I. Co.; Clealum mine, N. W. I. Co.; Roslyn Fuel Co., Beekman; Roslyn No. 5 mine, N. W. I. Co.; Roslyn No. 6 mine, N. W. I. Co.; Washington Union Coal Co., Tono No. 2 team.

The rating of the prize-taking teams was: Roslyn No. 6 mine, first, with 95 per cent.; Washington Union Coal Co., second ($10 cash), with 84 per cent.; and No. 5, Roslyn No. 5 mine, third ($7.50 cash), with 83 per cent.

The first prize was a silver cup, donated by the E. I. du Pont de Nemours Powder Co., to be won two successive years by the same team, American Mine Safety Association medals and $10 cash. The winning team consisted of A. Stanfel, captain; J. M. Boose, William Bedner, A. Tomatich and W. Mohar. The members of the second-prize team were R. B. Ober, captain; John Ismay, Robert Wigley, Thomas Wigley and Thomas Kruger. The third-prize team included Walter A. Sneddon, captain; D. Shields, R. Lucas, J. Heathcock, Jr., and Luther Lloyd.

Dudley Michell, of Victoria, B. C., instructor in first-aid and mine-rescue work for the British Columbia Department of Mines, judged the contest and was assisted by H. M. Wolflin. John Parker, of Newcastle, rendered much service in expediting the work of the contest.

MINE EXPLOSION DEMONSTRATIONS

Demonstrations of the inflammability of coal dust were given during the afternoon, with the object of showing to miners and mining men generally how necessary it is to exercise care in placing holes and firing shots in mines, since a windy or blown-out shot is liable to cause an explosion that may result in the loss of many lives. The first demonstration was given by firing a charge of Monobel, a permitted explosive, into a dust-laden gallery, which did not cause an explosion. Afterward two other charges were fired into the same gallery, each charge consisting of one pound of black powder, and each caused an explosion followed by fire. The attendance at the Ball Park was larger than at the first-aid contests in the town, there having been between 2500 and 3000 people present to witness the mine-rescue event and the explosive-firing demonstration.

Among many others who attended and coöperated in making the meet a success were C. H. Younger, of Kirkland,

WINNERS OF FIRST PLACE IN FIRST-AID CONTEST FOR TWO CONSECUTIVE YEARS

Clealum No. 7 team of the Northwestern Improvement Co. Left to right: Back row—Wilson Clark; William Saul, captain, Fred Ashurst; Henry Owens. Front row—Joseph Parker; Joe Andreotty patient.

Wash., chief inspector, Department of State Factory Inspection; Clarence Parker, industrial insurance commissioner, and many coal-mine company managers and superintendents. The North Western Improvement Co. was represented by C. C. Anderson, Tacoma, general manager; Peter Bagley, superintendent of the company's Roslyn division; Arthur Hodder, superintendent of the Clealum division; J. D. Scott, superintendent of Ravensdale mine; J. E. Morgan, assistant superintendent of Roslyn and Clealum mines and in charge of first-aid and mine-rescue work. Other companies were represented as follows: Roslyn Fuel Co., by Charles E. Jones, general manager; Washington Union Coal Co., Tono, by E. S. Brooks, general superintendent; Osage Coal Co., Cumberland, by W. D. Williams, superintendent; National Coal Co., Cumberland, by Edwin Husband; Pacific Coast Coal Co., by Natt Moore, chief engineer, Seattle, and Ed. Bergen, mining engineer, Burnett; Roslyn Cascade Coal Co., by William Mackay, manager, and Roslyn Coal & Coke Co., by A. F. Plant, manager. E. Jacobs, of Victoria, secretary of the western branch of the Canadian Mining Institute, was one of the visitors from outside the state.

OUTPUT OF STATE IN 1914

As indicating the extent of the coal-mining operations of the State of Washington, the following summary for the year 1914 has been taken from the last published report of the state inspector, James Bagley:

The number of coal mines and openings of all kinds was 58. The total production of coal was 3,040,361 short tons; average value at mine, $2.35 a ton; total value, $7,142,084. The total production of coke was 78,573 tons; average value at ovens, $5.15 a ton; total value, $404,126. The total number of coal-mine employees was 5647—outside employees, 1264; inside employees, 4383. The average number of days operated was 206. The yearly production of coal per employee was 555 tons; the daily average per employee was 2.69 tons. The production of coal by counties was as follows: King, 1,042,607 tons; Kittitas, 1,237,564 tons; Lewis, 87,558 tons; Pierce, 553,841 tons; Thurston, 112,189 tons; Whatcom, 6602 tons. Coke was produced in Pierce County only, the total for the year being 78,573 tons.

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Montana First-Aid Meet

By John L. Boardman*

SYNOPSIS—The Montana union miners exhibit their interest in the safety of their fellows and hold a most successful two-day meet at Billings, Mont.

The second Montana State-Wide First-Aid Meet was held at South Park, Billings, Mont., July 23 and 24, under the auspices of the Montana Coal Operators' Association, the United Mine Workers of America, district No. 27, the Anaconda Copper Mining Co., the United States Bureau of Mines and the American Mine Safety Association.

Teams were present from Klein, Roundup, the Anaconda Copper Mining Co.'s mine at Sand Coulee, Washoe, the Smith mine at Bear Creek, Red Lodge, the Smokeless and Sootless mine at Bear Creek, Stockett, the Boston & Montana Reduction Works at Great Falls, the Anaconda mine at Butte, the West Colusa mine at the same place, the Washoe Reduction Works at Anaconda and the Leonard mine at Butte.

MINERS UNION TAKES A LEADING PART

The judges, who were eight in number, were all medical practitioners. The committee of arrangements consisted of Henry Drennan, James Hunter and Robert Condon, president, vice-president and secretary-treasurer respectively, of district No. 27, United Mine Workers of America; W. D. Ryan, mine safety commissioner of the United States Bureau of Mines; C. W. Goodale, chairman, Bureau of Safety, Anaconda Copper Mining Co.; M. F. Purcell, secretary-treasurer, Montana Coal Operators' Association, and John L. Boardman, foreman of car No. 5, United States Bureau of Mines.

The teams from Lehigh and Carpenter Creek had been expected, but failed to attend. At 1 p.m., July 23, all teams and officials of the contest assembled at the Northern Hotel and embarked in automobiles furnished by the Billings Chamber of Commerce. The cars then lined up, and led by a band also furnished by the Chamber of Commerce, paraded to South Park, where they were unloaded and the field meet began at 1:45 p.m.

The contest consisted of a one-man, a two-man, a three-man and a full-team event. In each the teams were required to work two problems, one each day, making eight in all. At 3 p.m. the teams had completed the first four problems and turned the field over to the mine-rescue demonstration.

AN EXPLOSION FOLLOWED BY A MINE FIRE

A representation of a mine had been built of 2x4's and tar paper, in which it was proposed to have an explosion and to rescue supposed victims. The explosion took place according to schedule, but on account of the extremely hot sun the flash of the black powder used in the demonstration set fire to the heated tar paper, and before the rescue crew could enter the tunnel the entire structure was in flames. The men who were to have acted as victims were obliged to escape through the sides of the mine before the rescue crew arrived. So from the viewpoint of the rescue crew the demonstration was more or less of a failure, but from that of the audience it was a spectacular success.

Immediately following the mine explosion an association football game was played between teams from Roundup and Klein, in which the Klein team won by a score of 3 to 1. The prize for this game was $100.

On the second day, July 24, the teams came to the grounds at 1 p.m., in automobiles, but without the parade, and immediately went to work on the other four problems.

LEONARD MINE OF BUTTE TAKES FIRST PLACE

The first prize, consisting of American Mine Safety Association silver contest medals and a silver loving cup donated by Dr. McDonald, of Stockett, was won by team No. 5 of the Leonard mine, Butte, but the A. M. S. A. medals were not received in time for presentation to the winning team. The members of this corps were as follows: George Ethier, captain; Homer Hagens, James McLeod, Saul Ryan, William Barraugh and Frank C. Deakin.

The second prize, consisting of American Mine Safety Association bronze contest medals and $75 cash, was won by team No. 9 of West Colusa Mine, Butte. These medals also failed to arrive in time. The members of the team were as follows: Frank Tanhauser, captain; R. Allen, James Blake, W. Lewin, W. Kelly and B. McDermott.

The third prize, consisting of $50 cash, was won by team No. 10 of the Washoe Reduction Works, Anaconda. This team was tied for third place by team No. 6 of Klein, but in working off the tie team No. 10 won third place. The fourth prize, consisting of $30 cash, was won by team No. 6 of Klein. The fifth prize, consisting of $20 cash, was awarded to team No. 8 of Tracey, Sand Coulee post office. The special prize of a silver loving cup presented by the Montana Coal Operators' Association and held for the past year by the Red Lodge team was won this year by team No. 10 of Anaconda for making the highest average in the team problems.

Promptly at 9 p.m. all members of the teams and the officials connected with the meet assembled at the Northern Hotel and seated themselves at a banquet. After coffee and cigars were served, and under the direction of W. D. Ryan, who presided, a number of officials and guests were called upon and responded with short talks on various subjects touching the work for the coming year. Prizes were presented by Robert Condon, secretary-treasurer, district No. 27, U. M. W. of A., and James Needham, general manager of the Republic Coal Co. A resolution was adopted regretting the untimely death of J. A. Holmes, former director of the United States Bureau of Mines, and commending his life of faithful service to the mining industry.

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United First-Aid Corps Meet

By Lewis Richards*

The United First-Aid Corps of the Fourth District, Delaware, Lackawanna & Western R.R. Co. coal department, held a most successful first-aid contest at Harveys Lake, Penn., on Aug. 14. It is estimated that 8000 persons attended, 4000 of whom traveled on special excursion trains which consisted of six sections with 10 coaches to a section.

The contest was close, eight teams averaging between 99 and 100 per cent. Some of the work was declared by the judges to be so good that it could hardly be termed first aid.

Twenty-four teams entered the competition. The first prize of $75 was won by the Loomis inside team, which made a score of 100 per cent. This Loomis mine is owned by the D., L. & W. R.R. Co. coal department. The second prize was $50 and was awarded to the Harry E. colliery of the Temple Coal Co., which had a rating of 99.83 per cent. The third prize was won by the Baltimore shaft team of the Woodward colliery of the D., L. & W. R.R. Co. coal department, the rating being 99.66 per cent. The other scores were as follows: Pettebone mine (D., L. & W.), 99.5 per cent.; No. 9 breaker (Pennsylvania Coal Co.), 99.33 per cent.; No. 20 tunnel, Truesdale mines (D., L. & W.), 99.13 per cent.; No. 1 slope (D., L. & W.), 99 per cent.; Bliss mines (D., L. & W.), 99 per cent.; Woodward outside team (D., L. & W.), 99 per cent.; Central team from Scranton (D., L. & W.), 98.75 per cent.; Storrs No. 2 team from Scranton (D., L. & W.), 98.66 per cent.; Auchincloss mines (D., L. & W.), 98.33 per cent.; Loomis outside team (D., L. & W.), 98 per cent.; Plymouth Coal Co., 97.83 per cent.; No. 1 Red Ash, Woodward mines (D., L. & W.), 97.66 per cent.; Pine mine of Scranton (D., L. & W.), 97.66 per cent.; Avondale mine (D., L. & W.), 97.5 per cent.; Raub Coal Co., 97.08 per cent.; No. 17 slope, Woodward mine (D., L. & W.), 96.33 per cent.; Forty Fort Coal Co., 96.33 per cent.

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*Foreman car No. 5, United States Bureau of Mines.

*Secretary and inside foreman, Truesdale Mines, 212 East Green St., Nanticoke, Penn.

In the boys' event only D., L. & W. boys took part. The Truesdale breaker boys made 99.83 per cent., receiving a prize of $10, and the Woodward breaker boys 99.33 per cent., being awarded the second prize of $5. The doorboys at the Woodward colliery made 96.17 per cent.

Troop I, Boy Scouts, of Kingston, was the only troop entered in the Boy Scouts' event. Though schools and churches were permitted to enter their juvenile members none took advantage of this opportunity. The Scouts made 100 per cent. and received a prize of $10. All the boys did excellent work. The Woodward boys had been organized only a short time. The Boy Scouts used improvised material, and their instructors are to be commended for the excellent showing made by the troop.

The president of the United First-Aid Corps of the Fourth District is John Thomas, foreman of the D., L. & W. R.R. Co. coal department mine rescue service. The vice-presidents are George Harlow, of the Woodward mines, and Henry H. Hitchins, inside foreman at Auchincloss colliery. The manager of the field was Charles Enzian, of the Bureau of Mines. The judges were Drs. D. G. Robinhold, Charles L. Shafer, J. A. Smurl, W. W. Waters, C. E. Bennett and J. H. Hughes The judges did not regard time as an element in determining the winners, the judgment being rendered wholly on the excellence of the work and not on the speed with which it was executed.

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Compensation to Injured Men

In Colorado some miners are working who took part in the Balkan wars. Some of these have already lost a limb, and when the matter of insurance against accident arises, it is realized that the loss of another limb would result, not in mere reduction of earning power, but in complete incapacitation. As the law now stands, the company which employed such men would be obliged to pay as much as for the loss of two limbs, when only one was lost in the service of the company.

The companies are presenting this objection before the Industrial Relations Commission of Colorado and are seeking to have the law modified so that they will not be obliged to discriminate against those men who, being already afflicted, much need the work. Men who are not possessed of all their limbs and faculties are more liable to injuries than others, and it is not considered right that the company should pay the excess insurance rate which the hiring of such men involves.

Nor is it a desirable arrangement for the employees themselves; for it will inevitably result in the employer protecting himself by not hiring or by discontinuing the employment of crippled or otherwise abnormal men when such crippling or abnormality has not resulted from service to the company. In this way it will be hard for men of this kind to get work, as their labor is at once more hazardous and less effective.

The Victor-American Fuel Co., which presented the proposition to the commission, stated that it did not intend to discharge any of its men during the present biennial period; that it would assume the increased risk and increased insurance cost; but it requested the commission to arrange that the law be changed at the next session of the Legislature so that this trouble will not exist.

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Safety Meets at the Panama-Pacific Exposition

In view of the great interest manifested by first-aid teams from mining colleges in the Third Annual Joint Field Meet to be held by the United States Bureau of Mines, the American Mine Safety Association and the California Metal Producers Association in San Francisco, Sept. 23 and 24, the rules committee has withdrawn the restrictions against such teams participating in the meet.

The ruling previously made that only teams from bona-fide mining, smelting and milling operations should be admitted to the interstate contests of Sept. 24, thereby restricting teams from mining colleges to participation in the demonstrations of Sept. 23, has been modified to provide that such teams and teams from state departments or other institutions interested in safety in mining, but not concerned in mine operation, may compete among themselves on the 24th for a special prize for the most proficient team from an educational institution.

It is hoped that a special prize or cup may be offered as an award to the team winning in this special competition. It is believed that this modification of the rules governing the meet will result in the sending of a large number of teams from the various colleges and universities in the West.

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Americans Won't Work in Mines

About 50,000 of the 180,000 mine workers in the anthracite coal region of Pennsylvania are classed as "Americans," but this figure includes every employee born in this country, though many of their parents are foreign and do not speak a word of English. Mine superintendents in the region state that Americans would rather earn $1.50 a day at some "clean collar" occupation than twice as much in the mines. They attribute this to the false pride of the Americans, who have come to look down on manual labor.

"It takes more than one generation to make a miner," said an old Welsh foreman the other day, "and yet the second generation born in America invariably leaves the mines. The miners in the hard-coal districts of Pennsylvania are probably the cleanest laboring-men in the world. They take a thorough scrub every day, and when you see them downtown in the afternoon in their outdoor clothes you can't tell whether they work in the mines or in a store. But the American young man seems to imagine that some sort of social stigma attaches to the coal dust and the daily bath.

"Who are the men who dig your excavations and subways in the big cities? Italians, mostly. The Irish used to be willing to do it, but they no longer are. In the mines it is the Slavs that are doing the bulk of the work. Roughly speaking, we have, besides the 50,000 'Americans,' about 76,000 Slavs, 12,000 Italians, 11,500 Irish, 10,000 Austro-Hungarians, 6500 Welsh, 6000 Germans, 6000 English and 2000 men of other nationalities."

Discussion by Readers

Efficient Mine Foremen

Letter No. 1—I desire to offer the following remarks as showing what an efficient mine foreman can do in the way of maintaining good ventilation in a mine in his charge, and hope it will start a discussion of this question that may result in a very general improvement in conditions relating to good mine ventilation.

One occasionally visits a mine where his observations lead him to conclude that the foreman in charge either lacks the ability to apply practically what knowledge he has or that his store of resourcefulness is extremely limited. This is the case with many mine foremen when left to their own resources; they depend too much upon their assistants to carry on the actual work and give the necessary directions in the mine of which they are the nominal head.

Some time ago I visited a mine where I found the conditions, so far as ventilation was concerned, in a chronic state. Indeed, the air was so bad that it was not possible to see any distance ahead in the entries or rooms. There were 16 drivers hauling coal to a single sidetrack, and all of them were using oil lamps. As the amount of air traveling was insufficient to carry away even the smoke of the lamps, it may well be imagined what the condition was in the airways. One might suppose that the trouble was owing to the fan being too small for the ventilation of the mine or to the area of the airways being insufficient for the volume of air required. The fan, however, was sufficiently large and the area of the airways ample for a circulation four times the quantity of air necessary to ventilate the workings.

The trouble was not with the mine or its equipment so much as with the foreman in charge. This man spent most of his time on the tipple, where he could breathe freely, and the ventilation of the mine was left to take care of itself. Since the general enforcement of mine legislation tending to improve conditions in all mining districts, I have thought it impossible to find conditions in any mine as poor as they were here. Even the mules were unable to pull coal, although that was not necessary, as the miners could work only three or four hours each day. By that time, the smoke of the lamps and powder used in blasting had so filled the mine that the men were obliged to quit work and go home.

Compare these conditions with those that I am about to describe, which followed immediately on a change being made in the foremanship of the mine. The old foreman left and a new man was put in his place. According to all accounts, the new man has worked wonders in the mine. He has made it possible to get a full day's run each day. The miners put in a full day's work and the mules pull the coal without difficulty.

You ask, How did the foreman accomplish this change? I answer, It was very simple. The fan was capable of producing 65,000 cu.ft. of air per minute, although under the former management the circulation of air at the working face was only 15,000 cu.ft. per min. Under the old system, the mine was ventilated by a continuous current. The new man got to work promptly. He discovered that most of the stoppings or brattices were leaking badly. In fact, the wonder was that any air at all was able to reach the working face. He replaced the old stoppings of decayed brattice boards with substantial rock and cement. He split the air current in two places. Within a short time the conditions were so improved in the workings of the mine that it will be remembered by the men as long as they live.

A few days ago I met "Old Tom," who has worked in this mine for 15 years and is nearly done digging coal. Old Tom is 50 years of age and has what is called the "miner's asthma," as a result of the bad ventilation of the mine. He gasps as he talks. In reply to my inquiries as to his health, he said: "I'm feeling pretty good this morning (gasp); I'm a whole lot better than I was before this new man came here. Do you know (gasp) if that Jim Jones was still foreman in this mine, I would have been dead by this time. The new man sure knows his business (gasp). Where I used to load but two cars a day, I can now load four cars (gasp) and then walk out with only taking one rest, where I used to have to rest four times (gasp) before getting out of the mine. The new fellow sure is a fine man and knows his business."

Meeting the boss driver a little later, and remarking on the condition of the mules, he explained: "Yes sir, they are looking well and feeling good; but you should have seen them before the new man came. All of them were played out before noon, and many a time I have had to haul a mule out of the mine. They could not work long in that air, but it is all right now." It is wonderful what a little practical knowledge and good management can do in a mine.

These are but two simple illustrations of the grateful feeling that existed among the men for the accomplishment, by the new mine foreman, of what the company had always been paying for and expected was being done in this mine.

It is unfortunate that so many mine foremen, like many day workers, require watching. The great difference is, however, that a careless, indifferent mine foreman can and does cause incalculable harm, and endangers the life and health of every man in the mine to a far greater extent than is true of the ordinary mine worker.

WILLIAM CROOKS.

Kimberly, Ala.

Letter No. 2—The ventilation of a mine seriously affects every man that enters. Other features connected with mining, such as the hoisting of the coal, the method of working adopted, the drainage of the mine, etc., only indirectly affect the mine employees. The ventilating current has been called very aptly, the "lifeline" of the mine.

While ventilation is the most important element in the mining of coal, it is strange to observe how little attention is given to the matter as a rule, except in cases where the mine is particularly gaseous and its efficient ventilation becomes a necessity.

Every "mine manager" as the mine foreman is called in Illinois, is supposed to know the theory of ventilation as applied to mining. But how often it happens that the foreman in charge of a mine is ignorant or inefficient, and as a result the working places are badly ventilated. Too often the main object in view is to obtain cheap coal and reduce the cost of production to the lowest possible point, and in doing this the foreman is constantly striving to beat his own previous record. Cheap coal is all right when its production does not interfere with or prevent the systematic work of mining and the maintenance of safe and sanitary conditions in the workings.

It is generally remarked that the majority of mine accidents are owing to carelessness. As a matter of fact, however, many of these accidents can be traced to the inefficient ventilation of the mine. They are too often the result of breathing air that is largely depleted of its oxygen and highly charged with deleterious gases, which cause languor in the workmen and induce carelessness. In this condition, it cannot be denied that many employees take chances that they would not take otherwise. Aside from this, there are other reasons why every mine should be well ventilated. The breathing of good air goes far toward reducing feelings of dissatisfaction on the part of the worker—the grouch is taken out of the man, and he feels better.

Now observe for a moment the effect produced sooner or later as the result of inefficiency on the part of the foreman in charge of a newly opened mine. At first there is an abundant supply of air, and it is perhaps necessary to leave two or more crosscuts open near the face so as to reduce the force of the air current, in driving narrow work. Later, if the foreman is inefficient and does not carefully supervise the work of building the stoppings, they soon develop leaks, with the result that the supply of air at the working face grows constantly less.

When a mine is developed under these conditions, it is only a question of time when the air supply at the face will be insufficient, and it will be necessary to repair the stoppings, which is often done at great expense; because in many cases the rails have been removed and it is difficult to get the necessary material to hand for building the stoppings and making them air-tight. As a result, much patchwork is done, both on doors and stoppings, and still the air supply will often be found insufficient, and it becomes necessary to shorten the distance of air travel by opening temporary airways or crosscuts through abandoned workings.

In most cases splitting the air current has been carried to the limit, and frequently the only recourse that remains is to sink a new air shaft, enlarge the airways, or install a booster fan at some point in the mine. Sinking an air shaft is often impracticable, while enlarging the sectional area of the airways for thousands of feet is generally prohibitive of that method also.

Under these conditions, the installation of a booster fan is resorted to by a foreman who has neglected to carefully consider the question of the future ventilation of his mine when the work of development was in progress. The booster fan is generally operated by electric power. Speaking of boosters, it must be remembered that in many cases such a fan accomplishes only the churning of the mine air. However, impure air in motion is better than stagnant air, and some good is accomplished even then.

The question that presents itself to the thoughtful man is, Why should any mine be brought to such a condition that it cannot be ventilated by the main fan at the surface? In the development of a large territory, ample preparation should be made at the start to furnish the maximum circulation required in the future development of the mine. The proposed plan and output of the mine should be determined and the necessary equipment provided. In the development of the mine, an efficient mine manager (foreman) will build good stoppings as the work proceeds, employing men for that purpose who understand what is necessary to be done. As far as practicable the same men should continue to do the same work from day to day. The practice of having some men build stoppings one day and of employing others to do the work the next day should not be tolerated, but the men engaged in this work should be responsible for the results.

Under a shale or slate roof an efficient foreman will often keep a track in both entries or airways, for the purpose of cleaning up falls that constantly occur. It will frequently prove good practice to arrange to take the empties in on one entry while the loads are hauled out on the other, and this will not only insure that both entries are kept in good condition, but will also greatly facilitate the ventilation of the workings when extended. In all these arrangements, the future working of the mine must be kept continually in mind. It is important to remember that it is not sufficient to provide a ventilating fan that is guaranteed to produce a given quantity of air at a certain speed, when no attention is given to the conditions underground. The airways must be kept open and unobstructed in order that the fan can do its work.

The question is often asked, Why is it that so large a number of mines have a good supply of air at the shaft bottom and on the main airways, while the working faces are so poorly ventilated? In answer to this question, it may be stated that the mining laws are often to blame for such a condition. In most coal-mining states, the law requires a specified volume of air to be circulated in the mine. This volume is usually 100 cu.ft. per man per minute, and 500 cu.ft. per animal employed in the mine. In most cases, the law fails to state where this volume of air should be measured, and as a natural result the measurement is taken at the foot of the intake or downcast shaft.

The bituminous mine law of Pennsylvania (1911) requires the mine foreman to measure the air once every week at or near the main inlet and outlet airways in the mine and also at the last cut-through in the last room and in the entry beyond the last room (art. 9, sec. 4). The Illinois mine law requires the air to be measured at the foot of the downcast and the upcast and provides further that doors, curtains or brattices shall be placed for conducting the required amount of air into the working places. The law leaves, however, much to the judgment of the mine inspector, and here there is room for argument, since one inspector may differ in his judgement from another. In my opinion, the inspector should be required to enforce laws and not obliged to make them. The making of the laws can only be intrusted safely to the representatives of the people appointed for that specific purpose.

It is true that the Illinois law requires the "mine examiner" (fireboss) to measure with an anemometer the amount of air passing in the last crosscut or breakthrough of each pair of entries, or in the last room of each division in longwall mines, and at all other points where he may deem it necessary, and to note the results of such measurements in the mine examiner's book kept for that purpose. But suppose he does not get a reading; he either reports "no reading," or he makes no entry in the book for that place. The state mine inspector is supposed to examine these reports. To secure good ventilation in all mines, however, at the working face, a law is required that will provide a certain definite quantity of air in circulation at the inby crosscut on each pair of entries and in the last breakthrough in each room, similar to the requirement of the Pennsylvania law.

W. L. Morgan.

East St. Louis, Ill.

Preventing Mine Explosions

Letter No. 7—In his letter No. 5, *Coal Age,* Aug. 14, p. 268, John Rose asks if the suggestions made in previous letters on this subject are strictly followed, will they "eliminate such explosions?" To this question, I answer "Yes," but they must be strictly followed.

I believe every recent explosion has been the result of someone in some way slipping a cog; that is to say, overlooking or neglecting some precaution that every one connected with the mine should observe. Some place has been allowed to become dusty; some shot was improperly prepared, or overloaded, or tamped with coal dust; or mixed explosives were used; or the ventilation has been permitted to become disarranged and to remain so till sufficient explosive gas has accumulated to cause an explosion; or something has been allowed to happen that should have been prevented.

The old adage is, "Accidents will occur in the best regulated families," but I believe that by eternal vigilance they can be reduced to a minimum.

I think that William Crooks, in his letter No. 3, July 24, p. 143, struck the keynote of the whole situation when he said: "In my opinion, the true solution of this question lies in a higher sense of duty among mining officials and a more thorough and intimate knowledge of the elementary principles of mining by the rank and file of mine operatives. Attention has well been drawn to the great need of education of mining men and of coöperation on the part of every mine worker and mine official," and adds, "As long as mines are operated in a careless and inefficient manner disasters are liable to happen at any time."

In regard to the question of strong air currents, I am not an advocate of excessive air currents. I believe that after introducing enough air into the mine to comply with the law and to so dilute as to render harmless the various mine gases, there is nothing to be gained by a further addition of air, which might increase the danger. The more air that is circulated through the mine the more moisture is carried out and the more difficult becomes the thorough humidifying of the air and prevention of dust. Also, a high air velocity keeps more dust in suspension and tends to pick up dust from the loaded cars on haulage roads and carries it in suspension or deposits it on timbers, ribs and gobs. Also, the more air supplied, the more oxygen there is present to help feed an explosion if one should occur.

I do not want the foregoing to be construed as advocating insufficient ventilation. On the contrary, I am a strong advocate of ample ventilation, but like all good things there can be too much of it.

In regard to the last two paragraphs of Mr. Rose's Letter No. 5, it must be remembered that the most efficient and competent man is apt, at some time, to have someone under him err, and I venture the assertion that, even if a human factor is not discovered in the cause for any particular explosion, it is there just the same.

Edw. H. Coxe.

Knoxville, Tenn.

Mining Laws and Legislation

Letter No. 10—In his letter No. 8, *Coal Age,* Aug. 21, p. 309, Mr. Hogarth has cited a portion of the law, art. 4, sec. 24, which he assumes I have either overlooked or disregarded in discussing the responsibility of the assistant mine foreman, and which he considers the final affirmative answer as to the said responsibility.

Instead of regarding this section as being clear, concise and final in this respect, from its phraseology and construction, I consider it, if not decidly equivocal, at least capable of a double meaning. I believe that its real intent and application cannot be determined without reference to previous portions of the same article.

When taken alone it must be admitted that this section is capable of being understood to mean that the assistant, as such, is amenable to the same penalties for the violation of any of the requirements of the act as the mine foreman, or it may be taken to mean that when the assistant is performing the duties of the foreman, during the latter's necessary temporary absence, he is then, to all intents and purposes of the law, a mine foreman, and as such is held responsible. Both of these constructions cannot be true, however, since if they were, the assistant would be equally responsible with the mine foreman, under all circumstances, and could not therefore be expected to comply with the instructions of the foreman in respect to carrying out the provisions of the act.

Sec. 1 of art. 4 stipulates, first, that "the mine foreman shall have full charge of all the inside workings and of the persons employed therein, in order that all the provisions of this act, so far as they relate to his duties, shall be complied with," and, second, that the assistants "shall act under his [mine foreman's] instructions in carrying out the provisions of this act."

These two provisions, to my mind, establish the preeminence of the foreman both as to his authority and responsibility, and may be logically regarded as emphatically and unequivocally referring all subsequent requirements of the act to his supervision and execution, either personally or by proxy.

In his interpretation of sec. 24, Mr. Hogarth has evidently understood the first construction I mentioned previously and by so doing has overlooked the more comprehensive stipulations of the first portion of the article. In the interpretation and application of a law, the intention of its requirements must be kept in view, and where the phraseology of any particular portion would make that intent obscure or uncertain, its meaning must be derived from those parts that are clear and emphatic. There is neither obscurity nor equivocacy, in the first section of the article, in regard to the authority of the foreman nor in reference to the subordination of the assistant. Bearing this relation to each other under the law, it would be inconsistent with the law's intent to contend they are equally responsible under the act, or to attempt to destroy the meaning and application of one portion by arraying against it another portion of such grammatical construction as to be capable of a misapplication in the practical operation of mines.

It is neither my desire nor intention to engage in a discussion that is of little practical value, but I regard it as the duty of every man in the name of justice to protest against an evident misinterpretation of a law. I have found nothing in the bituminous mine law (1911) that can be construed to make the assistant mine foreman any more or less than a representative of the foreman, and in this respect he occupies the same relative position as the representative of a constituency. In the discharge of his duties, he loses his individuality and becomes the embodiment of another whose will and pleasure he carries out. Therefore, I claim that the acts of the assistant are the acts of the foreman and the assistant cannot be held responsible for another's acts.

In the extract given from art. 19, sec. 13, the important point is to interpret correctly the meaning of the words, "the person or persons at fault." I would like to ask, Would it be just to place the fault on an individual who is acting in an official capacity under the instructions of another? The attempt has been made, both by mine inspectors and foremen, to hold the assistant foremen responsible, and this fear has been held, unlawfully, over the heads of the assistants, thus affording greater facilities for shifting the blame from the legally responsible party.

It would be interesting, in connection with this discussion, to read the decision of Judge W. H. Ruppel in the case of Joseph Willis vs. Commonwealth of Pennsylvania, and to note that in that decision the mine foreman is named as the official to see to the execution of the law, the assistant being referred to only as a delegated authority to carry out his orders.

I. C. Parfitt.

Jerome, Penn.

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Study Course in Coal Mining

By J. T. Beard

The Coal Age Pocket Book

THEORETICAL CONSIDERATIONS IN SPLITTING

Theory assumes that when an air current traveling in an airway divides, at a certain point called the "point of split," into two separate currents or "splits," the unit pressure (p) at the point of split is common to each split. In other words, two splits starting from the same point in a mine have the same unit pressure (p) and, for the same sectional area (a), the resistance (R = pa) is the same for each split. The same holds true for any number of splits (n) of equal area.

Whether the unit pressure (p) or the unit work (pv) is the factor common to each of two or more splits starting from the same point will not be discussed here. The law of dynamic equilibrium of fluids points to the equality of unit work for each split. The comparison of the relation of the quantity of air (q), the rubbing surface (s) and the sectional area (a), on these two basis of reasoning, is as follows:

Unit Pressure

$$p = \frac{ksq^2}{a^3}$$

For constant unit pressure:

$$q \text{ varies as } a\sqrt{\frac{a}{s}}$$

Unit Work

$$\frac{u}{a} = \frac{ksq^3}{a^4}$$

For constant unit work:

$$q \text{ varies as } a\sqrt[3]{\frac{a}{s}}$$

Practical Conditions—In considering the practical results of splittng the air current in a mine, it may be assumed that the power on the air (U) at the mouth (intake) of the mine remains constant. Assuming a number of splits (n), starting from the same point in the mine, the total area of passage is na and the formula for power is then

$$U = \frac{ksQ^3}{(na)^3}$$

which shows that, since in any case U, k, s and a are each constant, Q^3 varies as n^3, or Q varies as n, which is the number of equal splits, each having an area a.

In other words, the quantity of air circulated in a given mine, by a given power on the air (effective power), is proportional to the number of splits, assuming the splits all start from the mine entrance or so near to it that the resistance of the main intake entry, slope or shaft may be ignored. Under these conditions, splitting the air has no effect to alter the velocity or the resistance in the mine.

When the point of split, however, is some distance inby from the mouth of the mine or "daylight" the effect of splitting the air, in that case, is to cause a disproportion. The quantity of air circulated by a given power no longer varies as the number of splits; but the ratio of increase in volume is less, because the power on the air at the mouth of the splits is decreased by splitting.

Assuming, as before, a constant power on the air at the mouth of the mine, since the quantity has been increased by splitting, both the velocity and resistance have been increased in the main airway, which absorbs more power thus decreasing the power on the splits.

The Coal Age Pocket Book

Effect of Splitting on Velocity—In order to show the general effect of splitting the air current, at any point in a mine, on the velocity (v_0) in the shaft or main airway and the velocity (v_1) in the splits, it is necessary to know the ratio (m) of the rubbing surface (s_1) in the splits, to that (s_0) in the shaft or main airway; also, the ratio (n) of the area (a_1) of the splits, to that (a_0) of the shaft or main airway.

Then,
$$s_1 = ms_0; \quad \text{and } a_1 = na_9; \qquad (1)$$

and, since for a given quantity the velocity varies inversely as the area,

$$v_1 = \frac{v_0}{n} \qquad (2)$$

But, the power on the air (U) at the mouth of the mine is equal to the power (u_0) absorbed in the shaft or main airway, or both, plus the power (u_1) absorbed in the splits.

$$U = u_0 + u_1 \qquad (3)$$

or, expresed in terms of the mine, since $u = ksv^3$,

$$U = k\,(s_0v_0^3 + s_1v_1^3) \qquad (4)$$

Substituting for s_1 and v_1^3 the values given in equations 1 and 2, gives after simplifying

$$U = ks_0v_0^3\left(1 + \frac{m}{n^3}\right) = ks_0v_0^3\left(\frac{n^3 + m}{n^3}\right) \qquad (5)$$

Equation 5 shows clearly that, for a constant power on the air at the mouth of a mine, in splitting,

$$v_0 \text{ varies as } \frac{n}{\sqrt[3]{n^3 + m}} \qquad (6)$$

and, observing equation 2,

$$v_1 \text{ varies as } \frac{1}{\sqrt[3]{n^3 + m}} \qquad (7)$$

It appears from the last three equations that as the ratio of the split area to the shaft or main-intake area, represented by n, is increased the main-intake velocity (v_0) is increased, while the split velocity (v_1) is decreased, the increase and decrease of velocity, however, being less rapid than the change in the area ratio.

Effect of Spliting on Quantity—The quantity of air in circulation varies directly as the intake velocity v_0; or, for a constant power (U) on the air,

$$Q \text{ varies as } \frac{n}{\sqrt[3]{n^3 + m}} \qquad (8)$$

Effect of Splitting on the Mine Resistance—The total mine resistanec is the sum of the main-intake and split resistances.

Thus,
$$R = k\,(s_0v_0^2 + s_1v_1^2) \qquad (9)$$

and
$$R = ks_0v_0^2\left(\frac{n^2 + m}{n^2}\right) \qquad (10)$$

Finally, from equations 6 and 10 is derived

$$R \text{ varies as } \frac{n^2 + m}{\sqrt[3]{(n^3 + m)^2}} \qquad (11)$$

Inquiries of General Interest

Efficiency of Mine Fans

Will you kindly explain why there is such a great difference in the observed efficiencies of ventilating fans in mining practice. The initial depression, for any tip speed u, as expressed in inches of water gage, is commonly calculated by the formula

$$w.g. = \frac{1.2 \times 12}{1000} \times \frac{u^2}{g}$$

I have observed that the use of this formula gives widely different results in fans of the same size and operated at the same speed. How should the efficiency of these fans be calculated for comparison.

MINING ENGINEER.

Chicago, Ill.

There are two methods of estimating efficiency that have been more or less prevalent in fan practice. The earlier practice was to estimate the efficiency as the ratio of the actual gage in the fan drift to the theoretical gage as calculated by the formula given by correspondent, reducing this ratio to percentage by multiplying by 100. Later practice, however, quite generally bases the efficiency of a ventilator on the ratio of the power on the air, as measured in the fan drift, to the indicated horsepower of the engine driving the fan, as calculated from the indicator card.

In regard to the first method mentioned, it has been generally recognized that the water gage developed by the operation of the fan is not a true factor of the fan itself, since it is modified—indeed, we may say established, by the resistance of the mine against which a given fan driven at a given speed will produce a volume of air that will be greater or less according as the resisting pressure is less or greater. In other words, the action of the fan must be measured by both the volume and the pressure, since the one increases as the other decreases, for the same speed of the fan. It is evident, therefore, that the same operation of the fan may develop a higher or a lower pressure, depending on the resisting power of the mine or airway, which obstructs the flow of the air current, both in the mine and through the fan. This conclusion shows that the "manometric efficiency" permits of a true comparison of fans only when operating against the same mine resistance, and this explains in part the wide difference in the efficiencies of like fans operated at a like speed, but under different conditions.

In this connection there is another important consideration affecting the efficiency of centrifugal ventilators. For example, when a fan is operated against a less resistance than that for which it was designed, a heavy burden is thrown on the fan by reason of the increased quantity of air that rushes through it as a result of the low resistance against which the fan is working. Assuming that the total power operating the fan is unchanged, a larger proportion of this power is then absorbed in the fan itself and a less proportion of the power is effective in the mine, and the efficiency, which is the ratio of the effective power to the total power producing circulation, is rapidly decreased. Calling the efficiency K, if a total power U produces a quantity of air Q against a unit pressure p, we have

$$U = \frac{Qp}{K}$$

Now, practically, the power required to turn the fan varies as its speed of rotation, or the number (n) of revolutions per minute; and it has been too generally assumed that the quantity of air in circulation varies as the speed of the fan. This would be true if the pressure p varied as the efficiency K, which is not the case. A large number of experiments show that the efficiency varies as the $\frac{7}{8}$ power of the pressure against which the fan operates. Then, since the pressure varies as the square of the quantity of air in circulation, it follows that the speed of rotation varies as the $^5/_4$ power of the quantity of air in circulation, or the fourth power of the speed varies as the fifth power of the quantity.

The practical conclusion to be drawn from the relation thus found to exist between the power, speed and efficiency of the fan and the quantity and pressure of air in circulation is shown as follows: Assuming a constant power applied to the fan shaft, resulting in a practically constant speed of the fan,

$$Q \text{ varies as } \frac{K}{p}$$

Any change in ventilating pressure, owing to a change in the mine resistance, is accompanied by a similar though less rapid change in the efficiency of the fan. Consequently, there is always a loss of efficiency when a centrifugal ventilator is operated at a lower pressure than that for which it is designed; and, *vice versa*, there is always a gain in efficiency when a fan is operated at a higher pressure than that for which it is designed. These remarks refer to changes occurring in the mine or airway, with a constant power applied to the fan shaft.

On the other hand, assuming the conditions in the mine or airway remain unchanged, any increase or decrease in the power applied to the fan shaft is accompanied by a nearly proportionate increase or decrease in the speed of the fan, resulting in a similar, but not proportionate, change in the quantity and pressure of the air in circulation. In this case, since, practically,

$$K \text{ varies as } \frac{Qp}{n}$$

it follows if p varies as Q^2, and Q varies as the $\frac{4}{5}$ power of n, the efficiency varies as the $^7/_5$ power of the speed, or the fifth power of the efficiency varies as the seventh power of the speed. This shows that there is a gain in efficiency when a fan is operated at a greater speed than that for which it is designed, assuming the conditions in the mine remain unchanged. Likewise, there is a loss in efficiency when the fan is operated at a less speed than what that for which it is designed.

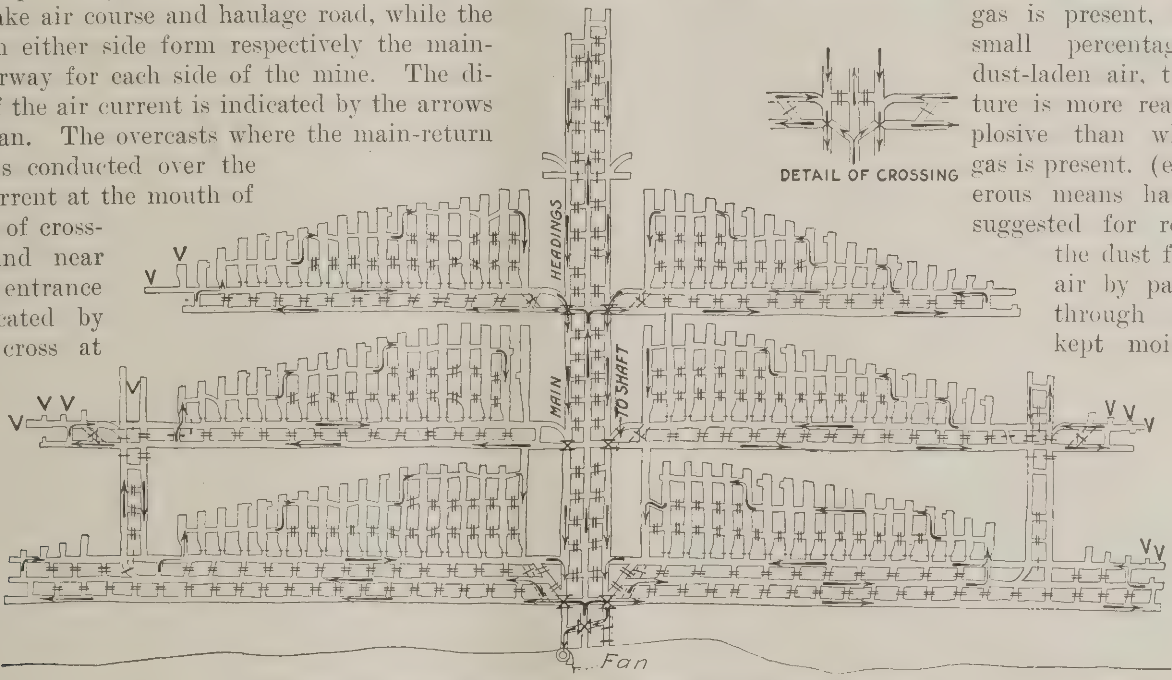
Examination Questions

Some West Virginia Questions

(Answered by Request)

Ques.—Show on the accompanying plan where the fan should be located and indicate the proper method of ventilation by means of arrows, showing the position of overcasts, doors, stoppings and regulators by means of the usual symbols. Note any violation of the mine law by the letter *V* on the plan.

Ans.—So many requests have been received relating to this question that we reproduce the plan of mine published in a former issue of *Coal Age*. The letter *V* indicates where rooms have been turned inside of crosscuts or where headings have been driven a greater distance than the 80 ft. specified in the mine law. The location of the fan is as indicated. This mine is opened on the triple-entry system, the center entry being its main intake air course and haulage road, while the entries on either side form respectively the main-return airway for each side of the mine. The direction of the air current is indicated by the arrows on the plan. The overcasts where the main-return current is conducted over the intake current at the mouth of each pair of cross-entries and near the mine entrance are indicated by a large cross at those points. Stoppings are indicated by a double line and doors by a single line crossing the heading or passageway, while regulators are indicated by a broken line across the heading. The general arrangement of the air crossings is shown in detail just above and at the right of the general plan.



SHOWING DEVELOPMENT OF A WEST VIRGINIA MINE

Ques.—(a) Is coal dust explosive? (b) If so, where are explosions of coal dust most likely to occur? (c) What weight of dust in air makes an explosive mixture? (d) What weight of dust and what percentage of marsh gas will make an explosive mixture? (e) What means have been proposed to remove coal dust from the air? (f) What method has been found most successful for purging the air of coal dust? (g) Is it best to prevent the suspension of coal dust in air or to remove the dust after it has been suspended?

Ans.—(a) Yes, under favorable conditions. (b) Coal-dust explosions are most likely to occur in dry and dusty mines, especially where a small percentage of marsh gas is present and where black powder is used for blasting the coal and suitable precautions are not taken to avoid excessive charges of powder and badly located shots.

(c) The weight of dust required to form an explosive mixture in air free from gas depends, to a large extent, on the inflammability and fineness of the dust. Experiments performed at Pittsburgh on fine bituminous dust that has been passed through a 200-mesh sieve produced explosions when the density of the dust-laden air was 1 lb. of dust per 500 cu.ft. of air, while other experiments at Liévin, France, showed explosions to take place when there was 1 lb. of dust to 230 cu.ft. of air.

(d) Marsh gas and dust without the addition of air would not form an explosive mixture; but when marsh gas is present, even in small percentages, in dust-laden air, the mixture is more readily explosive than when no gas is present. (e) Numerous means have been suggested for removing the dust from the air by passing it through curtains kept moist with water, or by sprays of water thrown across the entry through which the air is passing; also, by alternating the width of the airway, so as to cause a reduction of velocity at intervals where the dust would fall.

(f) The most effective means of purging the air from dust is to prevent its being thrown into suspension in the air current, by avoiding the accumulation of dust at the working face and the use of heavy charges in blasting. All fine coal and dust should be loaded out of the mine in dustproof cars, and the working face should be thoroughly watered before firing shots.

(g) Since an ounce of prevention is worth a pound of cure, it is better to use every precaution to prevent the suspension of dust in mine air, but means must also be adopted for the removal of dust that it is impossible to prevent getting into the air.

Coal and Coke News

Washington, D. C.

Sufficient time has now elapsed since the handing down of the decision of the Interstate Commerce Commission in the anthracite cases to permit the expression of some more definite opinions regarding it both by coal and railroad interests. Taken in conjunction with the decision in the matter of rates governing the transportation of railroad fuel and that regarding the rates to be charged for commodities generally by the Western roads, this opinion is regarded by competent students as the most important act of the commission for a long time in determining the relations between the carriers and the coal companies.

It is of course generally admitted that the significance of the decision is quite materially diminished by the fact that there is such an intimate relationship between the carriers and the producing mines in the anthracite region. That being the case, the decision is not regarded as of direct and fundamental importance to consumers or even, in the main, to miners as such, because of the almost complete identity between the anthracite roads and the coal-mining companies.

Should the commodities clause be so applied as to bring about a real separation between the mines and the carriers the effect of the anthracite decision will be considerably more practical and more marked. It will then be apparent what the result of a reduction in the charge for transportation will be in affecting the price of coal to the consumer. Meantime, it is noted that the commission itself seems to concede in the opinion that the verdict is of chief practcal importance to the producers of about 20 per cent. of the anthracite output who are supposed to be "independent."

The essence of the decision in the anthracite case is seen in the methods it employs for the determination of a reasonable rate for the carriage of freight. With due limitation it is assumed throughout the opinion that the coal furnishes practically the staple busines of the anthracite roads (a tabular view shows that it runs to one-half or more of all freight), so that in speaking of income from the transportation of coal reference is made to (substantially) the chief income of the carriers.

The Inherent Unlawfulness of Rates

The point of the opinion is then seen in the statement that ". . . We are impressed with the inherent unlawfulness of the rates and practices established by these carriers, which clearly are the outgrowth of past conditions wherein the carriers were producers, shippers, transporters and vendors of the commodity. If the rates they established for transportation were excessive it resulted in no hardship to their mining and selling operations because the excessive profits from the transportation services offset the absence of profit in their mining and selling operations. And high rates eliminated the competing shipper from the markets."

This conclusion is arrived at after an analysis of the conditions of capitalization and operation of each of the carriers involved, with remarks regarding the relations between each carrier and the coal-mining industry along the route or as controlled by the carrier in question. A curious feature of the decision is found in the fact that despite this criticism of the methods pursued in the past when the operations of mining and transporting were admittedly in the same hands. The commission goes on to say that the coal companies now controlled by the carriers "ship 80 per cent. of the total production, and if a substantial reduction is made in the tariff rates its full effect will fall upon but 20 per cent. of the tonnage shipped"—a remark which appears to imply that, in spite of all that has been attempted to the contrary, the same kind of control that has prevailed in the past will be expected to continue in the future.

Financially the exact effect of the decision is considered not easy to trace. The reductions ordered range from 15 to 50c. per ton, but without knowing the tonnage moving to various points at each of the newly fixed rates, an exact computation of the resultant loss of income is out of the question. Possibly the most significant financial aspect of the opinion is found in the computation of cost of transportation on anthracite coal per ton of 2000 lb. per mile as 3.3 mills, while average revnue on the coal roads is given as follows:

	Average Haul	Average Revenue per Ton Mile
Central R.R. Co. of New Jersey...	140.58 miles	9.45 mills
Lehigh Valley R.R. Co..........	157 miles	9.44 mills
New York, Ontario & West. Ry. Co.	209 miles	6.18 mills
Erie R.R. Co....................	169.90 miles	7.39 mills
Philadelphia & Reading Ry. Co...	185.70 miles	6.44 mills
Delaware, Lack. & West. R.R. Co.	147 miles	7.90 mills
Pennsylvania R.R. Co...........	221.43 miles	5.43 mills

Deducting the stated cost of transportation 3.3 mills per mile from the figures in the last column shows an alleged "margin of profit on tidewater anthracite" varying from something over 2.1 mills to something over 6.1 mills per ton-mile. It seems plain that the cut of 15 to 50c. per ton, equal perhaps to an average cut of 10 to 15 per cent. in haulage charges, is not expected to materially affect the revenues thought by the commission to be realized at present even if there should be no growth in density of traffic as a result of the reduction.

In some respects the most interesting phase of the opinion is thought to be seen in the remarks of the commission regarding the "practices" of the coal roads. Several of them are said to be still practicing what amounts to discrimination by granting the exclusive use of some of their piers, docks, storage plants, retail delivery trestles and other properties to their allied coal companies at inadequate rental charges and under conditions which constitute substantial discrimination in favor of such coal shippers, while several are alleged to have declined to establish joint rates for all shippers notwithstanding the coal output of their allied companies has been accorded an interline movement by means of trackage arrangements and the free transportation to junction points of the coal production exchanged by the coal companies controlled by the carriers.

Such practices are criticized as unlawful and discriminatory in the worst sense, since the discriminaton results to the benefit of the carriers. On the whole the action of the commission in ordering the abolition of these practices and the establishment of through routes and joint rates is thought by many to be the most decided feature of the opinion, if they should, as the commission predicts, have the effect to "neutralize any . . . undue benefit heretofore enjoyed by the coal operations of railroad ownership."

The Railway Fuel-Coal Decision

Considerable interest is likewise expressed in the decision of the commission regarding the practices governing the transportation of fuel-coal for railways rendered at about the same time as the general anthracite decision. This case, it will be recalled, was instituted because the commission's attention had been directed at various times to the method of handling railroad fuel-coal in vogue in Southeastern territory.

The fuel-coal in question, as is now brought out, is purchased f.o.b. the mines, and the factors taken into consideration in letting the contracts were (1) the price of coal at the mine mouth, (2) the division of the joint through rate which issued to the originating carrier, and (3) the cost of transporting the coal from the junction points to the points of consumption.

After considering the evidence in the case the commission reaches the conclusion that "one of the determining features if not the controlling one is the divsion of the joint through rates which must be paid to the originating carriers." The commission adds that "in order to intelligently bid for the coal contract it is necessary that the competing operators shall know definitely the amount of this division. While in ordinary commercial business the through rate to be paid for transportation is the important factor, here the essential factor is the division of the through rate paid up to the junction. For this reason all the facts and circumstances which make it desirable that the exact rate of transportation on commercial shipments shall be published make it desirable that the divisions of the rates under which railway fuel coal is transported be published."

On the strength of this reasoning the commission announced a determination to treat the railway fuel-coal like other coal moving over the lines. From this it follows that a railroad company when acting as shipper is entitled to the same consideration as a commercial shipper, and no more, even when the shipment moves in part over the rails of such a company.

In such cases the carrier is held to be entitled to a division of the joint through rate, such rate, however, having been fixed by the same considerations which would determine divisions upon a through commercial shipment in which the railroad had no interest other than that of carrier. For the future the divisions of rates in the case of fuel-coal over the roads involved in the controversy or inquiry are to be fixed by the commission and to be filed with it as in the case of other rates.

HARRISBURG, PENN.

The fifth annual reports of the Mining Institutes in the anthracite region, which are conducting mining schools at night, under the direct control of the public school boards have just been completed by the presidents and secretaries of these Mining Institutes, and have been compiled and arranged in a comprehensive and combined report by Charles K. Gloman, chief clerk of the Susquehanna Coal Co., Wilkes-Barre. This report has been made public by the companies which have taken an especial interest in this work.

This is the second season of direct control by the public school boards and of direct coöperation by the State Department of Public Instruction, with the continued moral and financial support of the operating coal companies, the wisdom of this method of control has been amply proved.

With advisory committees representing both the employers and employees to coöperate with the public school authorities the three elements are united which assures the present and future success of the schools. The needs of the employee and the needs of the employer are thus combined with the knowledge and experience of the educational experts. The best proof of the success of this combination is that 11 of the students passed the state examinations for mine foremen and 44 students passed the state examinations for assistant mine foremen this year, and the total number of students has increased enormously.

There were 2500 students enrolled in the schools of the Nanticoke Mining Institute, the Shamokin and Mt. Carmel Mining Institute and the Williams Valley Mining Institute in the season which ended this spring. The following table shows the remarkable growth of the first two institutes and their schools since they were founded in 1910:

	Nanticoke Institute	
	Members	Students
1910-1911	500	100
1911-1912	501	128
1912-1913	679	637
1913-1914	821	841
1914-1915	928	1269

	Shamokin and Mt. Carmel Institute	
	Members	Students
1910-1911	108	25
1911-1912	254	56
1912-1913	571	763
1913-1914	761	1016
1914-1915	1073	1052

In addition to this the Williams Valley Institute which has just completed its second year, had 295 members and 242 students.

It is not only the men who are instructed in the rudiments and the technical subjects which pertain to mining. During five months of the last season, Mrs. Anna Snyder Lape was employed by the Nanticoke Mining Institute as field secretary for the sewing classes for married women and employed girls. The last month of her time was devoted to a canvass of the houses in the community and she secured no less than 559 applications from women to attend the night school classes in sewing, cooking and English this Fall.

These schools conducted by the Mining Institutes under the direction and authority of the local school boards aided by the State Department of Public Instruction have the hearty support and coöperation of the coal companies whose employees attend them. In the Nanticoke district the Susuehanna Coal Co., the Delaware, Lackawanna & Western Coal Co., the Lehigh & Wilkes-Barre Coal Co., and the Alden Coal Co., are their supporters. In the Shamokin and Mt. Carmel district the companies interested are the Susquehanna Coal Co. and the Philadelphia & Reading Coal & Iron Co. The majority of the students at the Williams Valley Institute schools are employees of the Susquehanna Coal Co.

Similar night schools have been conducted in the boroughs of Plymouth and Shickshinny under the local school board auspices only.

PENNSYLVANIA

Anthracite

Scranton—Suits for coal royalties aggregating $328,906 were commenced against the Lackawanna coal company on August 26, on behalf of the Winton Coal Co. and the heirs of the Anderson, Dean and Livery estates. The money is alleged to be owing for coal mined from beneath portions of the city since 1871. One phase of the case is the request for $50,000 for culm that has been sold by the company after having been washed, the original lease not having taken the small sizes of coal into consideration.

Several houses within the city limits and over workings of the Lackawanna Coal Co. were badly damaged recently by a cave-in. In all five buildings suffered by having foundation walls cracked, the most badly injured building being an apartment house in which six families lived.

Parsons—Thousands of tons of coal are being stocked by the Delaware & Hudson Co. in the large tract of land opposite Hollenback Park. Rumor had it that the company was stocking coal in the event of a strike on Apr. 1 next, but this contention is denied. The coal officials state that stocked coal is subject to taxation in New York state and that the company has transferred its stocking plants to this state.

Mauch Chunk—Due to the numerous floods in the Lehigh River this summer a greater quantity of coal than for some years has been washed down and as a conseuence the river dredgers are more than usually active. About three cars of coal of good quality is being taken daily from the river at this point.

Beaver Meadow—The miners in the Evans Colliery, to the number of 200, went on strike when one of their members was fined by the foreman. After being out 5 days the difficulty was adjusted by the owners of the mine.

Nesquehoning—It has been a good many years since the collieries in this region have experienced so much trouble with water in the workings. While the collieries at this place have been gotten into workable condition, all the other collieries in the Panther Creek Valley are still badly flooded.

Shenandoah—A new bed of coal, over 30 ft. thick, has been discovered in the workings of the Philadelphia & Reading Coal & Iron Co. The present indications are that the vein extends for several miles along the mountain and is of such a size as to insure work for the inhabitants of this place for many years. It will not be necessary to erect a new breaker to take care of the new output, as its proximity to Shenandoah colliery is such that it can be taken care of by that plant without any difficulty.

Pottsville—The rainfall in the anthracite region this season has been almost without precedent as to volume. In six weeks almost 16 in. have fallen and as a conseuence the mines in many instances have been flooded, even with the pumps working to full capacity. As a result it has been impossible to work the lower measures, and in one instance in the Gilberton colliery the water attained a depth of 70 ft. Ordinarily in summer the seepage from the roofs practically ceases, but this year the men are compelled to endure the wet conditions in all parts of the mines.

No recent order of the Philadelphia & Reading Coal & Iron Co. has caused so much comment as the one canceling the vacation privilege of the salaried employees. This company had formerly granted a 10-day vacation to its salaried men with transportation over the lines of the Reading system. With the coming of the vacation period this year the men were notified that not only was the transportation order annulled but the vacation privilege with pay had also been abolished. The new order is causing a great volume of comment among mining men all over the Schuylkill field.

Bituminous

Connellsville—The shipment of coke from the Connellsville region recently broke the year's record amounting to 393,000 tons. This practically cleared all the yards of spot coke. The region is now operating 75 per cent. of its ovens to 95 per cent. of their capacity.

Bakerton—The mines in Bakerton and vicinity are now working full time, all the miners being busy. It is believed that this state of affairs will continue throughout the balance of the year.

Galitzin—The Birds Eye mine is being cleaned out. The operators have not stated whether the mine will be worked immediately or otherwise, but it has been reported that work will be resumed this summer.

Monongahela—More than a dozen coal mines in this valley have doubled their working forces and production in the last 10 days, and production is now at a higher rate than at any time this year. It is stated that this state of affairs is due to the fact that the railroads have decided to store enormous quantities of coal in anticipation of a shortage, because of the export demand and the threatened labor famine. Over 3500 men have been added to the payrolls in this valley.

Uniontown—Reports to the effect that H. V. Thompson, whose too extensive transactions in coal lands were responsible for the closing of the First National Bank of which he was the president, here early in the present year, is about to emerge from his period of financial difficulties are given considerable attention, inasmuch as it is reported that he is already paying off numerous notes, the past due interest on others and that numerous judgments that have been entered in the past few months are being stricken from the records.

An order increasing the output of the three plants of the Oliver and Snyder Steel Co., near here, from 30,000 to 40,000 tons monthly has been received and will speed the additional tonnage, General Superintendent J. H. Lane will put the plants on a 6-day working basis and employ a full complement of men, about 700 in all. Ever since the shift to the upward tendency in the coal and coke market the Oliver plants have been running 5 days a week, adding weekly to the working force until now they are ready to start full time operations with almost a full payroll. A few more men will be required, however. The output will be consigned direct to the company's steel plants at Pittsburgh.

Punxsutawney—A coal deal involving nearly 5000 acres was closed on August 29, between the Rochester & Pittsburgh Coal Co. and the Buffalo & Susquehanna Coal & Coke Co., two of the largest operating corporations in the bituminous coal region. For 2019 acres of coal in Jefferson, Clearfield and Armstrong counties the Rochester & Pittsburgh Co. has traded to the Buffalo & Susquehanna company a slightly larger acreage in Indiana County in the White Bush Flats region. About 1200 acres in Armstrong county, which the Buffalo & Susquehanna company had planned to mine through a new opening, will now be mined through the Cowanshannock Coal & Coke Co.'s opening at Numine. By the deal the Rochester & Pittsburgh company has lengthened the life of its Adrian operations 4 years, its Helvetia mines 6 years and its Numine workings nearly 20 years. The life of the Sagamore mine, of the Buffalo & Susquehanna Coal & Coke Co., has been increased at least 30 years.

WEST VIRGINIA

Glendale—The Hitchman Coal Co.'s mine north of Glendale has been closed for a short time in order that extensive repairs may be made. Improvements will be made in the fans and in the scales, the shutdown being merely temporary.

Charleston—All the coal mines located along the Little Coal River between Sovereign and Clothier are being operated full time with a full force of men. Nine mines are located between these two towns, and it is said that the operators have sufficient orders on hand to keep them busy for several months.

Hinton—The Miller-Pocahontas Coal Co. recently shipped its first carload of coal. Development of the property was begun Apr. 15 last, and the promoters are congratulating themselves on their rapid progress. This firm has 1083 acres of Pocahontas No. 3 coal on the Gugan River near Mullins.

ALABAMA

Birmingham—A substitute was adopted for the convict bill in the legislature, following an agreement of both sides. The bill provides that no convict of any class shall be worked in the mines of Alabama after Jan. 1, 1920, and no convict under sentence of less than five years shall be worked in the mines after Jan. 1, 1918. There has been a long fight over this bill.

It is understood that application will be made to the Board of City Commissioners by the Sloss-Sheffield Steel & Iron Co. for the relighting of the bee-hive ovens located near the Sloss furnace on First Avenue. Two years ago the city entered into a contract with the Sloss company, whereby in consideration of the city vacating in favor of the company certain parts of Third Avenue and nearby alleys, and withdrawing several damage suits, the Sloss company discontinued the operation of the coke ovens, which have been idle since Jan. 1, 1914. With the present demand for iron, the company is facing a shortage of coke, and it is understood will make application to the city to be allowed to relight the ovens until the rush of orders is completed.

KENTUCKY

Providence—Forty-seven men have been attending the miner's course which is being conducted at Providence by T. J. Barr, professor of mining engineering at the Kentucky State University. Mining, drainage, ventilation, machinery, fires, etc., were covered.

Frankfort—Clay and Jackson counties, Ky., have organized forest protective societies, 50,000 acres being included in the latter county. Lee Craft is president and S. G. Coons secretary of the Clay County Association and Joseph Tussy is president and W. R. Reynolds secretary of the Jackson Association.

Hazard—The Kentucky River Power Co., organized to furnish power to the numerous mining operations in this section has let contracts for clearing the rights of way and erecting poles along them. R. L. Cornell, general manager in charge of the work, and George Johns, foreman of construction, have moved their families to Hazard.

OHIO

Gaylord—The Gaylord No. 2 mine of the Pittsburgh & Cleveland Coal Co. will resume operation shortly at a little over half time. A considerable force of men was recently put to work cleaning up this mine. When started, this operation will employ about 100 men, and after running for a short time, a force of probably 175 men will be employed.

Athens—A gas explosion in Mine No. 6 of the Poston Consolidated Coal Co. near Athens caused a bad fire recently. The blaze was discovered early in the morning and after the local department tried unsuccessfully to stop the blaze the Ohio mining department was notified. The mine was sealed up to burn itself out. It will not be opened for several months.

Conesville—Barnes Mine No. 1, which has been closed down for more than two months for repairs to the tipple has again been placed in operation.

INDIANA

Terr Haute—The officers of district No. 11 U. M W. A. have ordered the closing down of three mines at Bloomsville which have been run on a coöperative plan. It is said that under the agreement between the owners of the mines and the miners the latter could not make as much as if employed under the union scale. The mines are the Menden, Caledonian No. 3 and the John Bull.

ILLINOIS

Monmouth—It is reported that the plant of the Monmouth Mining & Manufacturing Co. will be sold Thursday, Sept. 9, by Refere in Bankruptcy E. U. Henry at Peoria. It is believed that the James Green & Son Co. of Chicago will be the only bidder. The plant is in such shape that it could be started as soon as the new owners assumed charge. It is not thought, however, that operations will be begun before the latter part of September.

Belleville—Fire of unknown origin destroyed the fan house of the Oak Hill mine, near here, recently. The loss is several thousand dollars. The mine belongs to the Southern Coal, Coke & Mining Co.

Damage was done to a number of St. Clair County coal mines by floods during the past week. The airshaft of the Oakdale mine, owned by the Oakdale Coal & Mining Co., was flooded, necessitating a close down for five days. The same thing happened at the Suburban mine, which was idle for several days. Washouts on the Big Four, Vandalia, Southern, Baltimore & Ohio, Louisville & Nashville and Illinois Central railroads prevented shipments from this and adjoining counties and caused losses to the coal men, who were unable to fill orders. Normal conditions have been restored.

Pocahontas—Operations have been resumed at the mine of the Pocahontas Coal Mining Co. The mine had been closed down since last October. It employs 250 men.

Edwardsville—Farmers of Madison County who have lost their wheat and corn crops by rain and flood are planning to dig coal this winter in an effort to recoup their losses. In Foster township, particularly, there is a bed of coal of considerable thickness only a few feet beneath the surface. Few attempts have been made to mine it up to this time because the farmers could occupy themselves more profitably with their crops.

COLORADO

Denver—The Union Pacific and the Colorado & Southern railroads have appealed to the state supreme court for a review of recent rulings of the state pubic utilities commission regarding freight rates on coal, requesting that these rates be modified. Attorneys for the railroad companies assert that the new rates "are discriminatory and confiscatory" and that, if necessary, the cases will be carried to the United States Supreme court. If the state court should decide for the roads, appeal will be made for similar consideration of the new passenger schedules.

PERSONALS

George Watkin Evans is at present on a professional visit to Alaska.

C. A. Dorsey was elected trustee at a recent meeting of the creditors of the Wadsworth-Cahaba Coal Co. bankrupt.

Jacques Negru, technical chemist, Denver, has accepted a position with the Utah Fuel Co. and will have full charge of coking operations at Sunnyside, Utah.

G. A. Luckenbach, 1637 Jefferson Ave., Scranton, Penn., has been appointed factory representative in the anthracite field for the Koehler Co., Marlboro, Mass.

Walter E. Guller, formerly chief engineer of the Consolidated Indiana Coal Co., was recently appointed superintendent by the receiver for that company to succeed. J. R. Sharp, resigned.

A. R. Beisel, formerly superintendent of the Holden Mines of the United States Coal & Oil Co., has been appointed general manager of that firm, with offices at Stone, Ky.

E. J. Knickerbocker, assistant to the vice-president, was recently promoted to the duties of first assistant general sales agent, coal department of the Central Coal & Coke Co., Kansas City Mo., vice A. P. Moore, resigned.

Gustav Boehmer, president of the Boehmer Coal Co., of St. Louis, Mo., who had been in ill health for a year past, went to Lake Minnetonka six weeks ago. In a letter to his son, Will Boehmer, he says he is feeling fine and goes rowing every day although he is 67 years old.

Charles S. Snyder, for some years representative of the Buffalo & Susquehanna Coal & Coke Co., in central New York, with headquarters at Syracuse has taken a similar position with the Lehigh Valley Coal Sales Co. The vacancy has been filled by the appointment of H. S. Bradfield, of Buffalo.

Tom L. Lewis, formerly president of the United Mine Workers of America and later owner and editor of the Coal Mining Review in Columbus has been appointed secretary of the High Volatile Coal Operators' association of West Virginia. He will make Charleston, W. Va., his headquarters.

Hon. James E. Roderick, chief of department of mines of Pennsylvania, on Aug. 25 appointed C. H. Crocker, of Johnstown and Patrick S. King, of Smithfield to be inspectors of mines in the Bituminous region. Mr. Crocker will have headquarters at Blairsville and Mr. King in Freeport, they will take office on Sept. 15, 1915.

W. E. Mathews, for two years superintendent of the Mount Braddock plant of the W. J. Rainey Co., has resigned on account of ill health. D. K. Dillworth, chief clerk at the plant, is now acting as superintendent. For the present Mr. Mathews will remain at his home in Uniontown, Penn.

OBITUARY

W. C. Hill a prominent coal mine operator at Blanche, Cherokee County, Ala., was found dead in bed recently, dying from heart failure.

William Krumlauf, aged 62 a well known coal operator died at Alliance, Ohio, recently after an illness of several weeks.

Morgan Davis, Jr., aged 48 years, one of the foremost mining engineers in the anthracite region and a successful mine promoter, died Aug. 25, in a Scranton private hospital following 6 weeks illness of blood poisoning and pneumonia. He was a native of Mt. Carmel and a graduate of Lehigh University. Mr. Davis came to Scranton in 1895 to take charge of a department of the "Colliery Engineer," but later became a promotor of coal mining companies. The European war prevented the completion of a plan for consolidating a number of West Virginia coal mining companies whereby English capitalists were to found a fifty million dollar corporation, under Mr. Davis's management.

INDUSTRIAL NEWS

Pittsburgh, Penn.—The Goyne Steam Pump Co., of Ashland, Penn., is now represented in western Pennsylvania, eastern Ohio and West Virginia by the Harris Pump & Supply Co., 320-22 Second Ave., Pittsburgh, Penn.

Chicago, Ill.— The Gifford Wood Co. recently moved its office to the Sharples Building, in which it now occupies the entire second floor. This firm now has desirable office quarters and larger room for carrying and displaying its stock of machinery and tools.

Martins Ferry, Ohio—The Rail & River coal mine No. 1 recently broke its record for output for one day by putting out 2500 tons of coal. It also broke another record in working five days during the week. At this mine the coal is transported underground about three miles.

Huntington, W. Va.—Five million tons of coal held up in the Kanawha River awaiting a favorable stage was recently started southward. The majority of this shipment was to Cincinnati. The completion of lock and dam 28, aided by a rise in the river, made the shipment possible.

San Francisco, Calif.—A contract has just been closed for the erection in Honolulu of the largest vessel coaling plant on the Pacific, with the exception of the one at the Panama Canal. The plant will have a capacity of 165,000 tons and the contract price is $1,000,000, and will be built for the Inter-Island Navigation Co.

Pottsville, Penn.—The Philadelphia & Reading Ry. Co. recently started placing additional sidings adjoining the trackage at the coal dock at Palo Alto. The purpose is to store approximately 5000 tons of bituminous coal against the contingency of a strike in the hard coal regions next spring. Two thousand four hundred tons of coal are already stored on the dock.

Boston, Mass.—The rumored sale of the Garfield Proctor Coal Co. wharf at New Bedford, Mass., to the Pocahontas Fuel Co., and recent negotiations for a site at Portland, Me., by the same company are developments that are being watched with some interest. On the surface it looks as if some of the established houses would have a formidable competitor for inland tonnage.

Philadelphia, Penn.—A record freight rate for carrying coal will be paid to the Danish steamship "Gurre." This vessel has been chartered to carry a cargo of 3000 tons to Coquimbo, Chile, for which she will receive $12 per ton, or nearly $40,000, which is about one-third the value of the vessel. The coal, which is bituminous, brings about $1.50 f.o.b. mines. The consignees, however, will pay nearly $20 a ton.

Charleston, W. Va.—July established a coal tonnage record for the Norfolk & Western R.R., the tonnage for that month surpassing that of June by 173,980 tons. During July this road hauled 2,854,445 tons, as compared with 2,680,465 tons in June, which was up to that time the largest month's traffic in the history of the road. It is firmly believed by railroad officials and mining men that the record for August will considerably exceed that of July, and that the 3,000,000-ton mark is not far distant.

Buffalo, N. Y.—There is a move to induce the coal roads to place a charge of $2 on all cars reconsigned in transit. Some of the leading mine owners are asking it and it is believed that all will join in the request when it is understood. This will cut off the shipping of cars in quantity to various parts of the country unsold and oblige the mines to hold their coal back till there are orders for it. It always happens when the market runs dull that certain mines will flood the country with consignment coal in order to keep running. This ruins what firmness there may be left and sets consumers to waiting for coal under demurrage.

New Orleans, La.—It is considered a matter of some doubt, in general industrial and transportation circles here, whether the railroads will profit by the ruling of the Interstate Commerce Commission, and increase the coal rate from Alabama fields, from $1.25 to $1.40 per ton. The decision of the commission denied the carriers the right to maintain the $1.25 rate on bunker coal, and made the order applicable only on a general advance including both bunker coal and coal for city delivery. If the railroads advance the bunker rate 15c. per ton, they will lose the business of harbor delivery to the Pittsburg fields through river competition. In recent contracts signed by local coal dealers, the latter invariably stipulate the purchaser has to pay the increased rate in the event that the roads follow the ruling of the commission.

Charleston, S. C.—Announcement was made recently from the offices of R. L. McKeller, assistant freight traffic manager of the Southern Ry., that the modern export coal-handling plant which has just been completed at Charleston, and which will give the Southern facilities unexcelled for the handling of coal, will be opened shortly. In view of the great demand for export coal from this country, the completion of the handling plant is regarded as particularly auspicious. Millions have been expended in building the plant, providing a storage yard of 400-car capacity and making additions to passing tracks along the Southern lines over which the coal will pass. The Charleston terminal will have a capacity of 40 cars, or 2000 tons an hour, which is said to be as fast as any ship now in the coal carrying trade can take the coal. It will be operated entirely by electricity and will deliver coal into the holds of the ships with a minimum of breakage by means of an electric conveyor.

Coal Trade Reviews

General Review

Tendency to hold closer to the circular in the anthracite trade. Incipient car shortage developing in the bituminous regions. Deadlock in British labor negotiations creates renewed interest in export trade. Reports generally more optomistic.

Anthracite—Most forehanded buyers concluded their purchases at the lower prices prevailing earlier in the season and the final addition to the company's circular, bringing quotations up to the full winter schedule, developed scarcely any last-minute buying. On the other hand, orders have been substantially less than normal throughout the summer, while the recent unseasonably cool weather has served to stimulate interest in the market, and there is a notably stiffer tone to the anthracite situation. The season opened with a better feeling in hard coal circles than for a long time and, while there is still plenty of coal available at concessions on the regular circular, there is a well-defined tendency noted in all quarters to get closer to these figures. The light buying among consumers for storage purposes throughout the summer, and the fact that the large companies are accumulating unusually heavy stocks, indicate an exceedingly healthy condition in the anthracite trade.

Eastern Bituminous—A shortage of labor and a restricted car supply, the first indicia of an active coal market, are at hand. Car shortages are reported on both the Pennsylvania and the B. & O., while other lines have been forced to put their shippers on a restricted allotment. The improvement so far is reflected in the larger volume of coal moving rather than in any increase in prices, but there is no doubt that producers are becoming more optimistic, and there is a definitely better tone to the market.

Exports—The apparent deadlock in the British labor negotiations has created new interest in the foreign trade and resulted in more inquiries from abroad. While the accumulation at some of the Atlantic seaboard terminals is, perhaps above normal, this coal is in most instances, only waiting vessel tonnage. When foreign consumers are definitely convinced that British shippers will be more or less out of the market for the balance of this year, at least, the export business is scheduled for one of the most remarkable booms in the history of the American coal trade.

Lake Trade—There is renewed activity in nearly all branches of the Ohio trade. The gradual increase in the demand for domestic coal, due in part to the recent unseasonably cool weather, is forcing dealers into the market and there is a strong feeling that this improvement will be consistently maintained until the fall trade opens up. The occasional tonnages of consignment coal, forced sales of which have had such an unsettling influence on the market, have now practically disappeared. There are persistent rumors to the effect that the railroads are accumulating large stocks against emergencies and manufacturing concerns are generally increasing their working schedules. The restricted movement in the Lake trade continues the chief depressing factor in the current situation. The improvement is also noticeable to the South, though it is confined more particularly to the volume of coal moving rather than to prices.

Middle Western—The recent cool weather has stimulated buying somewhat and further price advances are under consideration, but in view of the unfavorable response to the recent increases, it is hardly likely that this will be attempted at the present time. The heavy floods in the district tributary to St. Louis, interfered with the movement to such an extent that prices were temporarily forced up though they have since reacted to their former level. The delayed crop movement due to the wet weather, has delayed country buying because of the scarcity of money. The dull market shows a slow but perceptible betterment; increased activity is noted in the steam lines and there is a broader market for the domestic grades.

A Year Ago—Anthracite slows down to a more conservative basis. Much of the West Virginia high-grade bituminous fuels are now out of the market. Large contract closed with Italian government. Internal business adversely affected by slow industrial conditions.

BUSINESS OPINIONS

Boston News Bureau—The paramount factor in the situation today is the position of sterling exchange. A year ago demand sterling bills sold at $5.06. The strength was based on the fact that we owed Great Britain between $300,000,000 and $500,000,000. The banks would not surrender gold at first. They held to gold bills like grim death. A gold pool of $100,000,000 was formed. The pool, however, supplied only absolute wants, but it acted as a weight upon the market and probably prevented demand sterling going higher than it did. But we could see ahead well at that time. We knew that the time was not far off when the balance of trade must turn in our favor, which it did. Today Great Britain owes us three or four times as much as we owed her a year ago on current account, and the amount is daily increasing. Moreover, she cannot see any means of settlement except by gold, a loan or liquidation of our securities. A sufficient amount of gold is inaccessible, and British investors are loath to dispose of their American securities in quantities. So far as her balance of trade is concerned, it is bound to be heavier against her.

Dun—Intrinsically sound fundamental conditions more than offset the adverse influence of existing problems and uncertainties. While increased conservatism is natural under the circumstances, general business has nevertheless made further gains and belief in sustained improvement remains unshaken. Wall Street has given a notable demonstration of confidence after a brief period of unsettlement and though stability has not yet been restored in the foreign exchange market, an adjustment of the present difficulties is expected to result from the negotiations now being conducted. Another large French credit has been established here and New York has assumed a commanding position as the financial center of the world.

Bradstreet's—Uplifting factors continue to assert themselves in trade and industrial circles, but at the same time there is a degree of unevenness in particular sections and certain industries that deprives the situation of uniformity. However, optimism as to the future seems unabated; our international political relations, apparently grave early in the week, appear to have improved; house trade at various centers has been increased by the presence of visiting buyers; some sections report larger road orders; mail-order trade goes on increasing; the southern situation is brighter; money everywhere is plentiful at low rates.

Southern Lumberman—Yellow pine is steadily increasing in price strength, and though orders actually booked this week are scarcely in excess of the volume recorded last week, inquiries are more numerous and the business placed has been at better figures. Nearly all the large manufacturers have issued new price lists since Aug. 1, and some have instructed salesmen to quote advances on lists issued during the past ten days. Better domestic demand for hardwoods is reported from both producing and distributing centers, though this is offset somewhat by lessening in exports, both demand and shipments. While the export movement probably would have kept up to what has been done for the past three or four weeks if shipping space had been available, a slackening in British demand is also reported this week, due to recent shipments from this country.

Marshall Field & Co.—Wholesale dry goods distribution has not been as heavy this week as during the corresponding week a year ago, although the number of buyers in the market has been about the same. The outlook for supplies of imported lines of merchandise was not at all promising a year ago on account of the war, and consequently caused a great rush of buyers to the market and created heavy road sales. Conditions this year surrounding supplies of merchandise are well known, so that it is only natural that immediate distribution would not compare with that of a year ago. Merchants continue to feel optimistic toward fall business. Collections are about normal.

ATLANTIC SEABOARD

BOSTON

Pocahontas and New River market unchanged. Good fall prospect for large export trade. Georges Creek receipts light and Pennsylvania operators look for better demand later. Water freights easy. Anthracite slow.

Bituminous—September opens with no important change in the market for the Hampton Roads coals. Prices less than $2.85 f.o.b. are only occasional now, most of the large shippers being well enough supplied with export orders to move the surplus over coastwise contract requirements. Receipts on contract here are about as usual but there is no spot demand worth mention. The vacation season is now nearly over and it is possible inquiry will improve as the month advances.

Shippers are taking a more hopeful view of the market. The off-shore business is expected to show no let-up for months to come and prices for future delivery are being firmly held. Indeed, there are some who predict that the export trade will be heavier than ever when it is realized particularly in South America that British shippers are out of the market at least until well into 1916.

The Georges Creek shippers are among those who look for an active foreign demand. In August there was a little falling-off in tonnage, but this is expected to be more than made good during September and October. The volume of this grade coming here is still relatively small, although prices are as firm as ever.

The Pennsylvania grades are extremely dull, output being closely held down to contract requirements. There is some hope now of a better demand by the end of this month, particularly if the Southern coals are firm at $2.85. The fact that certain shippers who ordinarily do a large bunkering business in these grades are not likely to be under their usual pressure to make terms may have a bearing on negotiations with the mine-workers next spring.

Water Freights show no change, although the charter demand is perhaps as nearly nil as at any time this year. There is some likelihood of several sailing vessels coming back into the coastwise trade during the fall. More American bottoms have been off shore this year than any year since 1863.

Anthracite—Quite an amount of business was entered the last few days of August in order to save the last monthly advance, but trade is sure to be slack again for a fortnight or so after Labor Day. It will take a better demand at retail than exists now to make much room for September shipments. All the domestic sizes are in plentiful supply, with chestnut the long size. Suprisingly little is heard in this territory from the individual houses.

Bituminous prices at wholesale are about as follows:

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines*	$0.85@1.40	$1.15@1.60	$1.67@1.77	
Philadelphia*	2.10@2.65	2.40@2.85	2.92@3.02	
New York*	2.40@2.95	2.70@3.15	3.22@3.32	
Baltimore*			2.85@2.95	
Hampton Roads*				$2.75@2.85
Boston†				3.50@3.68
Providence†				3.55@3.68

* F.o.b. †On cars.

NEW YORK

Bituminous situation shows more snap. Mine prices increase. Outlook for busy fall promising. Railroads place large orders. Anthracite shippers hopeful. Many inquiries received. Mines working better. Companies storing coal. Full winter circular goes into effect.

Bituminous—There has been a decided improvement in the soft-coal situation. Demand has increased generally and there has been a substantial advance in mine prices for certain grades. The railroads are largely responsible for the changed conditions. One road is said to have placed an order for nearly one million tons of such coals at Latrobe and Greensburg, to be stored at various points. As a result these coals have been practically taken out of the market for the present.

Tidewater conditions have not as yet felt the improvement but it is the general opinion that in a few weeks business will be active. Mines in the central Pennsylvania fields are working on a three to four day-a-week basis. Car shortages have developed on both the Pennsylvania and Baltimore & Ohio. Many mine workers have left the regions for their native countries but it is not known how seriously this will affect mining operations.

The export situation is holding up. There is little talk being indulged in but it is known that some shippers of Pocahontas coals have gone on the outside to complete cargoes. The situation in Wales has caused many inquiries here and the outlook is encouraging for American exporters. Freight rates continue high. Bunker coals are still in good demand.

Current quotations are on the following basis:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.20@3.30	$3.20@3.30	$3.20@3.30	$1.75@1.85
Georges Creek Tyson	2.90@3.00	2.90@3.00	2.90@3.00	1.35@1.45
Clearfield:				
Medium	2.65@2.80	2.55@2.65		1.10@1.25
Ordinary	2.55@2.60	2.55@2.60		1.00@1.10
Broad Top Mountain				1.10@1.45
Cambria County:				
South Forks	2.90@3.05			1.35@1.50
Nanty Glo	2.75@2.80			1.20@1.25
Barnesboro	2.65@2.70			1.10@1.15
Somerset County:				
Quemahoning		2.70@2.85	2.70@2.85	1.20@1.30
Medium	2.65@2.70	2.60@2.65	2.60@2.65	1.10@1.15
Latrobe	2.45@2.55			.90@1.00
Greensburg	2.75@2.80			1.10@1.15
Westmoreland	3.15@3.20			1.35@1.45
West Virginia Fairmont ¾		2.60@2.70	2.60@2.70	.80@ .90
Fairmont mine-run		2.45@2.55	2.45@2.55	.75@ .85
Steam		2.45@2.50	2.45@2.50	.90@ .95
Western Maryland		2.35@2.40	2.35@2.40	.85@ .90

Anthracite—The fall season opens with a better feeling in the anthracite coal situation. Dealers are beginning to stir and there are prospects of a busy fall and winter ahead. Mines are working on a better schedule with the companies storing all surplus coals. The West is not taking so much coal while the reverse can be said of the East. Inland dealers are getting busy. One reason advanced for the slow buying during the spring and summer was the refusal of dealers to extend credit and the first touch of cold weather will bring orders for quick deliveries.

The last monthly advance of ten cents per ton on prepared sizes was made on Sept. 1, the companies winter schedule going into effect on that date. While it is too early to give any definite figures on shipments of anthracite during August it is expected they will show a reduction as compared with the corresponding month of 1914. There is no great surplus of hard coal on hand. Nut coal which was the weakest of the prepared sizes is not so pressing but is being offered by individuals at from 25 to 35c. off companies' circular. Egg coal continues plentiful and is being quoted at about 35c. off with stove at 25c. below circular.

The steam coal situation shows but little improvement. There is no surplus because of the mining restrictions. Nos. 2 and 3 buckwheats are practically out of the market. Pea coal of the better grades is quoted at from $3.15 to $3.25. Buyers of No. 2 buckwheat are not promised shipments inside of ten days.

Current quotations follow:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$5.05		$5.10	
Egg	5.30	$4.80@5.30	5.35	$4.90@5.35
Stove	5.30	4.80@5.30	5.35	4.90@5.35
Chestnut	5.55	5.00@5.55	5.60	5.10@5.60
Pea	3.50	3.25@3.50	3.55	3.50@3.55
Buckwheat	2.75	2.25@2.75	2.80	2.25@2.80
Rice	2.25	1.75@2.25	2.30	2.00@2.30
Barley	1.75	1.45@1.75	1.80	1.75@1.80

PHILADELPHIA

Anthracite shows improved tone, with good trade in sight. Most sizes still offered off circular, but prices show tendency to stiffen, especially pea. Bituminous improved, and brisk exports continue, with vessel tonnage short and rates high.

Anthracite—There have been unmistakable signs of improved business the past week. Buyers who have held off until the last minute to lay in their winter fuel supply are beginning to send in their orders influenced no doubt by the real fall weather that prevailed the latter part of August. Practically all the representative dealers are stocked to capacity and they state it is their intention to carry full supplies for an indefinite period. After Labor Day it is expected the movement of coal will begin in real earnest, as that marks the end of the vacation period, with schools opening and families all home.

There is still plenty of coal to be had at prices less than circular. Egg continues in demand at a fair price while on stove $3.70 is about the average, showing it is rather weaker than a month ago. Chestnut is still variable as to price, fluctuating from April circular up to current circular; although the latter figure is being asked in a few instances there are actually no sales being made. Pea is a little firmer, probably because the individuals have booked about all they care to at the unusually low prices prevailing all summer and they are now trying to secure from ten to twenty cents more on present offerings.

There is a definite tendency on the part of both the big shippers and the individuals to really get nearer the full circular prices now that the expectation of a brisk fall and winter trade is in sight. The retail men, however, seem to hesitate to put in effect the fall and winter rates. This is usually customary with the first of September, but for the time being they are sharing with their customers the advantage they have had in buying. This surely will not last very long now and a few more cold days will see prices at the full winter level.

This week the producing interests announced the full fall and winter circular prices effective Sept. 1, which are as follows, to which the Pennsylvania State tax of 2½% must be added:

	Line	Tide		Line	Tide
Broken	$3.50	$4.75	Pea	$2.50	$3.25
Egg	3.75	5.00	Buckwheat	1.25	2.25
Stove	4.00	5.00	Rice	.85	1.75
Chestnut	4.15	5.25	Barley	.50	1.50

Bituminous—While there has been nothing noticeably brisk about the business this past week, there is undoubtedly a better tone and most of the shippers are really optimistic, feeling that the worst is now behind them, with indications of an active season ahead. The only activity of the week was still confined to slack coal; there has not been any particular large change in prices and there is no doubt that the slight stringency will be overcome with the increased demand for the other sizes.

The news of the export trade is only a repetition of the story for several months past—brisk, with an ever increasing volume of inquiries. The one great difficulty continues to be the difficulty in making charters. There is only a light tonnage offering, most owners holding off, feeling that still better rates are a certainty. The ruling prices are as follows:

Georges Creek Big Vein	$1.65@1.75	Fairmont gas, mine-run	$1.15@1.25
South Fork Miller Vein	1.50@1.60	Fairmont gas, slack	.70@ .80
Clearfield (ordinary)	1.00@1.20	Fairmont lump, ordinary	.85@ .95
Somerset (ordinary)	1.00@1.15	Fairmont mine-run	.75@ .80
West Va. Freeport	.85@ .95	Fairmont slack	.55@ .65

BALTIMORE

Market steady with tendency toward slight gains. Anthracite trade increasing. Export business increasing.

Fairly cheap coal is still offering considering the near approach of fall and winter. Lower grade fuels of West Virginia and Maryland are still to be had at around 85 to 90c. Pennsylvania ordinary fuels are bringing around 90c. to $1 at the mines. Medium to best coals call for $1.10 to $1.35, or $1.40 in some cases.

Anthracite dealers are feeling more confident over the situation. Household sizes for storage are now in fair call for early September. Many of the hard-coal men believe that the late September and October business will be very heavy, because nothing like the usual amount of spring purchasing took place.

Export business took a jump. During the week a total of 66,670 tons was loaded here for foreign ports. The previous week had shown a little more than 52,000 tons, and the week before that not quite 23,000 tons.

HAMPTON ROADS

Movement foreign still good. Prices firm with a steady foreign demand for New River and Pocahontas.

The coal movement from tidewater during the week has been heavy. The Italian ports are still getting the largest share of the export business and as usual the largest percentage of the coastwise movement has been to New England. The quantity supplied to steamers for bunkers has shown up well and although the number of steamers calling here may not be up to normal, the quantities taken are excessive.

In addition to the demand for standard grades of run-of-mine there has been some inquiry for nut and slack coal for the New England market and some large shipments have moved. The accumulation on the railroad yards is perhaps somewhat in excess of the normal supply but as a large number of the shippers have contracted tonnage due it is necessary that large quantities be kept to take care of vessels promptly.

During the past week the Virginian Ry. dumped over their pier in twenty and one-half working hours 614 cars or about 30,500 tons of coal. This is quick work seeing that only one dumper is used at this pier.

Railroad Tonnages—Dumpings over the local piers for the past several weeks compare as follows:

	Week Ending				
Railroad	July 31	Aug. 7	Aug. 14	Aug. 21	Aug. 28
Norfolk & Western	188,593	135,357	171,252	172,546	211,699
Chesapeake & Ohio	84,018	110,861	83,390	129,826	103,472
Virginian	39,335	64,397	63,066	77,136	82,131
Totals	311,949	310,515	317,708	379,508	397,302

Ocean Charters, Clearances and Freights

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	To	Tons	Rate
Josephine	Puerto	842	4.75[1]
Gurre	Coquimbo	1847	12.00
F. C. Pendleton	St. John	346	1.90

[1] Option coal and coke $6.50 and $11.50 respectively.

BALTIMORE

Vessel	To	Tons	Rate
Ecclesia	Italy	2385	
Sidmouth	Italy	2605	
Senator	Italy	626	
Roland	Gothenburg	2563	
Martee	Italy	2399	9.90
Elline	Italy	2780	9.90
Carl F. Cressy	San Juan	767	
Silverton	River Plate	1723	
Charlton	Piraeus	1937	9.96
Titania	Italy	2173	
Sesostris	Savana	1968	
Liguria	Italy	1958	
Evandale	Savona		

[1] Or Virginia.

VIRGINIA

Vessel	To	Tons	Rate
Kintail	Rio Janeiro	2252[2]	8.16
James B. Drake	Rio Grande	991	9.00
Sliedrecht	Bahia	1951	9.84
Marte[1]	Italy	2399	9.90
Ellin[1]	Italy	2780	9.90
Constantinos	Buenos Aires	1663	8.04
Hassel	Buenos Aires	2589	8.13
Georgios	Marseilles	2077	8.88

[2] 3 500 tons per day discharge, Sept.
[1] Or Baltimore.

ATLANTIC RANGE

Vessel	To	Tons	Rate
Franklin	Mediterranean		

Note—Steamers are indicated by **bold face type**, all others being schooners.

VESSEL CLEARANCES

The following steamers have cleared from Hampton Roads Aug. 20 to Aug. 27:

NORFOLK

Vessel	Destination	Tons
Circe[1]	Gibraltar for orders	3,790
Labor[2]	Savona	6,000
Orealla[3]	Naples	2,822
Southerndown[4]	St. Nazaire	5,448
Concetina[5]	Kingston	1,500
Mar Adriatico	La Plata	4,288
Penhale	Buenos Aires	5,910
Maria C.	Porto Ferrajo	4,250
M. Emmiricos	Piraeus	
Rosina	Montevideo	3,388
Buxton	Spezia	4,532
Achilles	Canal Zone	12,000
Livatho	Spezia	3,915
Wegadesk	Canal Zone	6,500
Scillin	Naples	4,536
Giovanni G.	Civita Vecchia	5,140
August	Genoa	8,800
Sebastiano	Naples	5,900
Trodenskjold	Curacao	5,460

NEWPORT NEWS

Vessel	Destination	Tons
Winnebago[6]	Rio de Janeiro	5,900
Lucinda[7]	Rio de Janeiro	1,820
Zoorichmoor	Taranto	5,500
Teespoole	Rio de Janeiro	6,261
Tairopinas[8]	Maddalena	4,400
Oaklands[9]	Marseilles	5,500

NEWPORT NEWS

Vessel	Destination	Tons
Commonwealth	Port Militar	4,300
Heina	Havana	4,570
North Pacific	Buenos Aires	6,800
Coquet	Marseilles	4,600
Salamis	Italian Port.	5,560

BALTIMORE

Vessel	Destination	Tons
Claveresk	Cuba	6,100
Allanton	Italy	5,866
Andros	Greece	4,407
Georgios	Italy	5,057
Evandale	Italy	5,156
Newstead	Cuba	4,000
Harmattan	Italy	6,200
Roland	Sweden	6,243
Liguria	Italy	4,435
Othon Stathalos	Uruguay	3,335
Ecclesia	Italy	5,300
Orion	Italy	4,300
Sidmouth	Italy	5,300
Senator	Cuba	971

[1] Flat Top Fuel Co. [2] Pocohontas Fuel Co. [3] Chesa. & Ohio C. & C. Co. [4] Baker-Whiteley Coal Co. [5] Hasler Bros. Co. [6] Berwind-White C. M. Co. [7] C. H. Sprague & Son. [8] New River Coal Co. [9] West Va. Coal Co.

OCEAN FREIGHTS

A number of steamers have been chartered to load coal for South American and West Indian ports. Plate rates are practically the same as a week ago. Mediterranean rates are firmer; several steamers were chartered last week at $10.16.

The freight market is now quotable as follows:

To	Rate	To	Rate
Havana	$2.50@3.00	Bermuda	**$3.00**
Cardenas or Sagua	3.00@3.50	Vera Cruz	3.25@3.75
Cienfuegos	3.25@3.50	Tampico	3.25@3.75
Port au Spain, Trinidad	**3.75**	Rio	8.28@8.40
St. Lucia	3.50@3.75	Santos*	8.40@8.64
St. Thomas	3.00@3.25	Montevideo	**8.04**
Barbados	**3.75**	Buenos Aires or La Plata†	**8.04@8.16**
Kingston	2.75@3.25	Rosario	**8.40**
Curacao	3.25	West Coast of Italy	9.84@10.08
Santiago	2.75@3.25	Barcelona**	9.12@9.36
Guantanamo	2.75@3.25	Valparaiso or Callao	7.00
Demerara	4.50@5.00	Marseilles	9.36@9.60

Note—Rates noted in **bold face** type are only approximate.

* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British steamers; neutral steamers are more difficult to obtain and the rates are always higher.

W. W. Battie & Co.'s Coal Trade Freight Report.

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge. 24c. per net register ton per day demurrage."

NOTES

Sweden—Arrangements have been completed for the export of 600,000 tons of coal from Germany to Sweden.

Philadelphia, Penn.—The U. S. Government has recently been arranging charters with steamers to load coal at Atlantic Range ports for San Francisco and various other Pacific coast naval stations. The first charter was for $4.85 per ton to San Francisco.

LAKE MARKETS

PITTSBURGH

Continued though slow improvement, with excellent line demand and light Lake shipments. Operations fully 60% of capacity. Recent advance in contract coal easily maintained.

The local coal market continues to improve, although rather slowly. The line demand is now described as excellent. The steel mills continue to run full and are taking somewhat more coal than a week ago. Railroad requirements have increased slightly. Lake shipments continue light but hope continues that there will be a slight spurt at least toward the close of the season. Some of the mines are operating nearly full, and while there are many operating three days a week or less they are usually the smaller mines and the operation of the Pittsburgh district as a whole is fully 60% of rated capacity.

There is still a surplus of free coal offered and prices are not quotably higher, although they are certainly firmer. The higher quotations lately in evidence on contract coal are very well maintained, operators feeling confident the market will be better in all respects later on. There has been little buying by retail dealers thus far but the fall movement is beginning in domestic coal. For free coal the market is quotable firm as follows: Slack, 50@60c.; nut and slack, 90@95c.; nut, 95c.@$1; mine-run, $1@1.05; ¾-in., $1.10@1.15; 1¼-in., $1.20@1.25, per net ton at mine, Pittsburgh district. On contracts to Apr. 1 the market is firm as follows: Slack, 85@95c.; mine-run, $1.15; ¾-in., $1.25; 1¼-in., $1.35.

BUFFALO

Car and labor shortage developing. Prices unchanged but notably stiffer. Anthracite companies stocking heavily in anticipation of a heavy winter demand.

Bituminous—The steady, though rather slow improvement promises to be hastened soon by a general shortage of both cars and men. Coal roads are beginning to put the mines on allotments of cars and some of the mines find that they have not men enough to meet sudden demands on them. There is every prospect of serious difficulty from both these sources early in the fall trade, as soon as the crops begin to move. At the same time the circular prices of bituminous are not higher, though they are more firm, slack going on a par with sizes. Some of the leading Pennsylvania coal companies have made a new price for Buffalo territory, 5c. lower than the last one, being, with freight added, $2.65 for lump, $2.50 for three-quarter, $2.40 for mine-run and $2.05 for slack. This will be the official Buffalo list of prices till further notice.

In a general way the Buffalo market is doing fairly well. There is now a feeling on the part of consumers that they should carry some coal. Cars are going to be short and the prospect of labor difficulties increases. Strikes are nearly certain in the early spring, and they may be preceded by other stoppages in the same line. Besides the actual consumption of coal is increasing steadily.

Anthracite—It is expected that the demand will begin to increase in a few days. What increase took place near the close of August was on account of the ten-cent reduction and was not large, as those who cared to take advantage of it had mostly done so when more reduction was offered. Buying during the summer has been as light as in any recent summer, yet the fall and winter trade may turn out not to be very heavy. People who have been out of work are doubling up their families and saving fuel.

The anthracite price this month resumes the maximum, which is $5.60 for grate, $5.85 for egg and stove, $6.10 for chestnut and $4.30 for pea, all f.o.b. Buffalo, with 25c. addition for loading on vessels. This includes the Pennsylvania state tax.

There is much report of coal being put into stock by the anthracite companies, which is an indication that they are confident that there will be a time before spring when they will be unable to meet the demand. Stocking coal is expensive and it also injures the market price of it. Shipments by Lake are not very active. One of the heaviest shipping docks is doing very little, on account of the congestion at upper-lake ports. The shipment for the week was 109,100 tons.

COLUMBUS

Increase in the demand for domestic sizes. Prices firmer and the tone of the market is improving. Manufacturing demand steadily increasing and railroads are stocking.

Renewed activity is reported by all branches of the coal trade during the past week This is especially true of the domestic trade where the demand is better and the volume of business increasing. Steam business is also rather active and prospects for the future are considered brighter.

Retailers who are now able to move their stocks are in the market for more coal; stocks are not as large as was supposed and they are buying freely for immediate shipment. Rural dealers are also experiencing a better demand since the rains have ceased. Retail prices are firmer all along the line. Pocahontas and West Virginia splints are still in good demand and there is some stocking of Hocking lump. Anthracite is coming into the Columbus market in larger quantities.

Steam business is also more active as manufacturing is steadily improving, especially along the line of making war munitions. Railroads are stocking up along their lines to guard against emergencies. Steam prices are strong and there is a notable absence of cheap demurrage coal on the Columbus market.

The Lake trade is rather active although the larger part of the tonnage shipped from Ohio ports is mined in West Virginia. The movement off the docks of the Upper Lake ports to the interior is better and a number of operators are rushing large quantities to the Northwest. Dock prices remain unchanged. The Toledo docks of the Hocking Valley handled 116,000 tons last week. More strength has developed in Pocahontas although some cutting in the last circular list is reported.

Prices in Ohio fields are as follows:

	Hocking	Pomeroy	Eastern Ohio	Kanawha
Re-screened lump.......	$1.45	$1.50		
Inch and a quarter......	1.35	1.35	$1.25	$1.30
Three-quarter inch......	1.25	1.25		1.25
Nut..................	1.15	1.25		1.15
Mine-run.............	1.05	1.10	1.00	1.05
Nut, pea and slack......	0.65	0.70	0.55	0.65
Coarse slack...........	0.55	0.60	0.45	0.55

Mines have been working at about the following percentages of full capacity:

District	Week Ended				District	Week Ended			
	Aug. 7	Aug. 14	Aug. 21	Aug. 28		Aug. 7	Aug. 14	Aug. 21	Aug. 28
Hocking....	25	25	30	35	Cambridge.	30	35	35	35
Jackson....	20	20	20	20	Masillon...	25	30	50	35
Pomeroy ..	25	40	40	45	Eastern O..	30	55	55	55
Crooksville.	30	30	30	30					
					Average..	30	33	34	38

CINCINNATI

A generally stronger market is noted. Demand improving somewhat in all lines.

A gradually improving demand for the domestic grades is the most significant feature of the market during the past week. This movement from now on should increase steadily as the bulk of the winter stocks are yet to be handled. The relative scarcity of nut and slack, due to the sub-normal domestic demand, is still the strongest factor in the steam market. In some lines of industry, especially the steel and machinery trades, plants are actively engaged, and require a maximum amount of fuel, but the general industrial situation remains such that the coal requirements are not sufficient to make a strong steam market.

TOLEDO

Considerable coal passed through Toledo ports in August. Ore movement shows improvement. Possible car shortage predicted.

Toledo coal dealers who have just returned from the upper docks claim that the supplies there are extremely heavy and are not moving as rapidly as could be desired. This of course will keep the Lake traffic down unless the situation there should change notably within a short time.

Some concerns report Pocahontas and smokeless coals as showing a trifle weakness; others are entirely sold up and predict a heavy demand for all smokeless coals a little later on due to the general opening of business in the East and the heavy shipment to Tidewater. It is also predicted that this will boost the price of other high-grade coals.

There is some improvement noted in the domestic trade. Threshing will not be over until the first of October this season, owing to the wet weather. Some dealers are of the opinion that a car shortage will soon occur as the demand for moving crops will undoubtedly be very heavy and the call for ore cars is becoming insistent. Prices here remain fairly firm.

DETROIT

Slight improvement noted in steam grades. Less coal on demurrage. Lake freighters returning to upper ports light.

Shippers report an improvement in the market for steam coal during the week. Orders are not large and the buyers seemingly have not yet started stocking up, but there is a gratifying number of small orders coming in. There has been a reduction in amount of coal shipped into Detroit on speculation, much of which usually is forced on the market at prices that have exerted an unsettling influence.

Domestic sizes are rather quiet, neither the retail dealers nor the householders showing any disposition to stock up. A few retail dealers made an effort to increase their stocks of anthracite before the final discount period elapsed with the end of August but the amount of business booked was less than expected.

In the Lake trade the movement is far short of previous years. Freighters which usually take coal on every upbound trip are now going without cargo. The unloading docks on the Upper Lakes carry an unusual quantity of coal because of the belated shipment by rail to interior points.

LOUISVILLE

Larger movement and slight increase in prices. Retail trade weak.

An improvement is noted in the Kentucky market, both as to domestic and industrial grades; this refers principally to the volume moved though the September prices show a slight advance. They are, however, still abnormally low. The retail situation, especially in Louisville, is showing much less strength than usual at this time of year and prices are very low. The mines generally are working at from two-thirds to three-fourths of capacity and the prospects are that full time operations will be the rule soon. Prices rule at from $1.40 for block up to $2.10, and from 25 to 40 and 50 to 65c. for nut and slack, f.o.b. mines.

NEW ORLEANS

Bunker business on the river has now assumed almost normal proportions. The number of ships arriving and leaving this week indicates that there is a healthy resumption of river trade.

COKE

CONNELLSVILLE

Coke market definitely stronger. Sales of prompt furnace at advanced prices and higher figures quoted for forward. Production and shipments make new high record for the year.

Following the removal of some of the pressure in the prompt furnace coke market already reported the market has definitely turned stronger, with sales of prompt coke aggregating between 5000 and 10,000 tons at $1.60, a price which now seems to be the minimum of the market for standard grades. Production has been adjusted more closely to demand, while some of the furnaces that had required shipments on contract to be curtailed are now working better and taking normal tonnages. The continued improvement in the iron and steel market, and particularly the recent advances in pig iron, have encouraged operators to expect considerably higher prices in future.

There is also developing a substantial inquiry for contract furnace coke over the first half of 1916. Definite prices have not yet been quoted but operators feel they should secure more than $2 a ton on such contracts and as they recognize that it is difficult to close contracts at prices very much above the spot market they are disposed to ask higher prices for spot. Foundry coke continues strong while furnace coke is quotable higher on all deliveries, as follows: Prompt furnace, $1.60; September furnace, $1.75; furnace to Jan. 1, $2; prompt foundry, $2.25@2.60; contract foundry, $2.30@2.60, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Aug. 21 at 382,606 tons, an increase of 8193 tons and shipments at 383,628 tons, an increase of 4763 tons. Both production and shipments made new high records for the year.

Buffalo—There is a fair activity in the trade at former prices. An effort to advance the price in this market did not succeed. The tonnage continues considerably larger than formerly and if the situation is in any way indicated by the receipts of iron ore at this port there should be an advance soon. During four of the last days of August the amount was 150,441 tons. Coke prices continue at $4.25 for best 72-hr. Connellsville foundry and $3.30 for stock coke.

Chicago—The demand for all sizes of coke is stronger, and furnace and foundry coke particularly is brisk. There has been a general marking up of prices, and quotations are as follows: Byproduct foundry, $4.90@5.10; byproduct domestic, $4.75; Connellsville, $4.75@4.90; Wise County, $4.75@4.85; gas coke, $3.85@4.

MIDDLE WESTERN

GENERAL REVIEW

Market shows improvement. Domestic buying expanding. Anthracite shows signs of activity. Smokeless demand dull. Screenings steady at last week's prices.

Trade is of moderate proportions and still spotty but shows a slow though perceptible betterment. All grades of domestic coals seem to have a wider market and in steam lines there is increased activity reported. Orders from the country continue in better volume, and these orders call for a great variety of different sizes for immediate shipment. Lack of cash is still the main factor in country districts, accounting for delayed absorption, for which wet weather is much to be blamed. Many farmers depend upon their grain money to buy coal.

A number of Western railroads are making preparations to stock considerable quantities of coal beginning Sept. 1 in anticipation of a suspension in mining operations next spring pending the fixing of a new wage agreement. Some of the Western trunk lines have already started stocking to guard against emergencies.

While shippers in several fields are contemplating further advances in prices next month, averaging 15c. per ton, it is unquestionably true that the orders received so far have not kept pace with the advances already made. The weather turned suddenly cold on Thursday of last week which stimulated storage buying among householders. While a good deal of uncertainty has attended the screenings market recently, prices are now more firm than they were two or three weeks ago, and shipments on contracts are heavier.

Trade via the Lakes is still very slow, and it is the consensus of opinions that there is not much hope for any large movement during the present season. The docks are hoping for relief from congestion when the fall rush of orders begin.

Complaints are made in the Northwestern markets of considerable price cutting. Some of these disrupted prices apply to anthracite, but it is more general in bituminous coals.

A number of mines in the southern part of Illinois, and in the Springfield and Peoria districts, which have been closed since last spring, are reopening. The C. & A. Ry. has placed orders to rush all hopper-bottom cars now on storage tracks needing repairs to their Bloomington shops, so that they may be put in serviceable condition for hauling coal upon the arrival of colder weather.

CHICAGO

General advance in price schedules effective Sept. 1. Shipments in a larger volume. Smokeless weak. Good month-end demand for anthracite but prices remain low.

It is reported that most of the Illinois operators will increase list prices Sept. 1. Franklin County shippers will ask $1.75 for the coarse sizes, Williamson County the same, and others are expected to name a minimum $1.60 for lump and egg, and $1.75 for No. 1 washed. This prospective advance and increase in freight rates has caused a rush of business to the Franklin and Williamson County mines during the past week. Screenings are slightly easier, having declined on an average of 5c. per ton. Saline County operators expect to advance coarse sizes to $1.65 Sept. 1.

While Springfield operators are considering an increase in the circular, there is a good deal of doubt that this movement will be a concerted one. Steam and domestic coals have been stronger and screenings are about the same.

Shipments from the Clinton field have been in larger volume for domestic sizes, and it is said that the operators will advance prices 10c. per ton Sept. 1. The Knox County operators are still devoting most of their efforts to producing steam coal which averages them 80c. per ton. The demand for Sullivan County coal is not improving as fast as elsewhere, although it is understood the operators will ask higher prices for Nos. 5 and 6 coal beginning Sept. 1. The Sullivan County mines are operating about three days per week, and most of their coal is being shipped to Indianapolis and the Gas Belt.

Smokeless mine-run is moving plentifully at $1.25, and the lower prices for August shipment have not so far been the means of stimulating the market to any extent. Smokeless shippers expect to return to the $1.40 basis on mine-run Sept. 1. Country shipments have improved, and no accumulation of prepared sizes has occurred. Pocahontas and New River lump is being readily absorbed at prices ranging from $2.10 to $2.15, and egg at from $1.90 to $2.25; the market has been more quiet than shippers anticipated.

Hocking coal has been in good demand for harvesting purposes, and prices have been firmly held. It is rumored that 1¼-in. lump will advance on Sept. 1 to $1.60.

Some little improvement is noted in the market for Kentucky coals. Apparently the demand from Southern points has increased, with the result that not so much free coal is thrown on the northern markets at low prices.

The demand for anthracite toward the close of August was stronger especially for chestnut. Considerable independent anthracite is still being sold under circular prices, notwithstanding the rate advance. Householders in Chicago have absorbed considerable quantities of anthracite of various sizes in the last ten days.

Quotations in the Chicago market are as follows:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump	$1.50@1.60	$1.35@1.50	$1.35@1.50	$1.25@1.50	$1.40@1.50
Steam lump	....	1.15@1.25	1.15@1.30	1.15@1.25	1.15@1.30
2½ and 3-in. lump	....	....	1.25@1.35	1.25	....
1¼-in. lump	1.25	1.25	1.20@1.25	1.15@1.25	....
Egg	1.40@1.60	1.35@1.50	1.15@1.25	1.25@1.35	1.15@1.30
Nut	....	1.25@1.35	1.00@1.10	1.00@1.10	1.00@1.25
No. 1 washed	1.45@1.60	....	1.45@1.50	....	....
No. 2 washed	1.35@1.45	....	1.40	....	....
No. 1 nut	1.40@1.60	....	....	....	....
No. 2 nut	1.30@1.40	....	....	....	....
Mine-run	1.05@1.10	1.00@1.10	.85@ .95	.95@1.10	.85@1.05
Screenings	.65@ .75	.65@ .75	.60@ .75	.60@ .75	.75

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.35@1.50	$1.35@1.90	$2.15@2.25	$1.75@2.00	$1.40@1.60
1¼-in. lump	1.25@1.30	1.25@1.50	....	1.25@1.35	1.25@1.35
Egg	1.35@1.50	1.25@1.35	2.15@2.25	1.75@2.00	1.25@1.35
Nut	....	1.00@1.15	1.75	1.25@1.40	1.15@1.25
No. 1 nut	1.35@1.50	....	....	....	....
No. 2 nut	1.25@1.35	....	....	....	....
Mine-run	1.10	.85@1.00	1.15@1.40	1.15@1.25	1.15
Screenings	.65@ .70	.50@ .65	....	....	....

ST. LOUIS

Severe floods have seriously interfered with the movement. Cool weather stimulates the demand and prices are firm.

Floods during the past week hindered the movement of coal to the St. Louis market and sent the price of lump up 5c. and that of screenings 10c.; the latter, however, lost half of the increase before the end of the week. There were washouts on nearly all the roads entering St. Louis and for several days there was no coal arriving. Local coal yards were submerged and could make no deliveries. The Terminal Railway Association had difficulty in handling the coal that was on tracks before the flood came.

The prices on anthracite for September shipment to East St. Louis and St. Louis are as follows: Chestnut, $7.55; egg, $7.30; stove, $7.30; grate, $7.05. The rate of $4.25 gross ton applies.

The cool weather has caused an increased demand for domestic coal and prices are ruling very firm on all sizes. Screenings have been well maintained during the week. The indications are that Sept. 1 will bring a marked advance in all domestic sizes.

Quotations are as follows:

	Franklin Co.	Williams Co.	Staunton	Sparta	Standard
6 in. lump	$1.50@$1.65	$1.40@$1.50	$1.30	$1.20	$1.10@1.15
3 in. lump	....	....	1.20	....	....
2 in. lump	....	....	....	1.00	.95
Egg	1.50@ 1.60	1.25@ 1.40	....	1.00	.90@ .95
No. 1 nut	1.50@ 1.60	....	....	....	.90
No. 2 nut	1.25@ 1.35	....	....	....	....
No. 1 washed	....	1.50@ 1.60	1.50	....	....
No. 2 washed	....	1.40	1.35	....	....
No. 3 washed	....	1.25	1.25		
No. 4 washed	....	1.20	1.15	....	....
No. 5 washed	....	.75@ .80	.80	....	....
Scgs	....	.55@ .60	....	.55@ .60	.55@ .60

The above prices are f.o.b. mine, Franklin and Williamson County coal rate to St. Louis being 72½c. per ton and the balance 57½c. per ton. Rates to East St. Louis, Madison and Granite City, Ill., are 25½c. lower.

INDIANAPOLIS

Shortage of gondola cars for first time this year. Movement of domestic lump continues to improve.

Operators are experiencing their first pinch this season in the way of a shortage of gondola cars. The trouble is mainly on the Vandalia lines which carries a large percentage of the output of the Indiana mines. The demand for domestic lump improves as the season advances. August, which is usually the hottest month, was unusually cool this year which made it necessary to buy some coal and served as a strong reminder that the coal season is rapidly advancing.

Operators have no trouble in disposing of screenings. No. 4 commands 90c. f.o.b. mines and No. 5 80c. It is said some No. 5 is being offered at 75c. but this is a low-grade product. With the opening of September retailers are beginning to get a little busier. Their prices remain unchanged.

PRODUCTION AND TRANSPORTATION STATISTICS

BITUMINOUS COAL MOVEMENT

The following is a summary of the movement of coal and coke over 13 principal railroads during May and the first five months of the last two years, in short tons:

	May		5 Months	
Anthracite	1914	1915	1914	1915
Baltimore & Ohio[1]	97,003	93,698	633,765	526,828
Chesapeake & Ohio[1]	1,270	1,367	6,224	4,990
Erie[2]	787,238	683,542	3,642,083	3,420,471
Pennsylvania[1] [3]	1,022,077	972,995	4,799,030	4,580,414
Virginian[2] [1]	....	145	52	342
Total 5 roads	1,907,588	1,751,747	9,081,154	8,533,045
Bituminous				
Baltimore & Ohio[1]	2,488,515	2,723,221	13,716,728	11,730,282
Buffalo, Roch. & P.[1] [2]	466,455	633,175	3,309,135	3,012,460
Buffalo & Susq.[1] [2]	43,125	81,162	490,772	437,829
Chesapeake & Ohio[1]	1,821,011	1,911,315	7,849,046	8,093,417
Erie[3]	4,262	10,432	32,683	45,328
Hunt. & Br'd T. Mt.[1] [2]	59,043	71,376	466,219	393,776
New York Central[3]	492,619	672,041	3,318,606	3,500,634
Norfolk & Western[1] [2]	2,338,672	2,434,614	10,200,365	10,047,876
Pennsylvania[1] [3]	3,543,218	3,393,328	19,657,638	16,597,074
Pitts. & Lake Erie[1] [2]	957,528	954,946	4,482,749	3,339,253
Pitts. Shaw. & North[1] [2]	152,807	152,640	1,016,809	899,733
Virginian[1] [2]	359.879	307,006	1,706,539	1,596,739
Western Maryland	187,228	266,763	1,301,792	1,344,024
Total 13 roads	12,914,362	13,612,019	67,549,081	61,038,425
Coke				
Baltimore & Ohio[1]	301,163	297,897	1,541,624	1,297,871
Buffalo, Roch. & P[1] [2]	21,175	33,662	118,397	166,803
Buffalo & Susq.[1] [2]	8,643	49,259	129,509	244,213
Chesapeake & Ohio[1]	31,040	21,803	178,363	87,343
Norfolk & Western[1] [2]	88,145	79,270	492,747	366,766
Pennsylvania[1] [3]	817,816	872,181	4,434,422	4,008,443
Pitts. & Lake Erie[1] [2]	428,395	427,333	2,299,069	1,791,030
Western Maryland	5,058	4,497	34,504	17,489
Total 8 roads	1,701,435	1,785,902	9,228,635	7,979,958

Total Coal and Coke 13 Roads	1914	1915
January	18,157,998	15,685,798
February	15,446,830	13,702,789
March	20,233,213	14,943,124
April	15,497,444	16,070,049
May	16,523,385	17,149,668
Total, 5 months	85,858,870	77,551,428

[1] Includes coal received from connecting lines.

[2] Includes company's coal.

[3] Does not include company's coal hauled free.

Note:—The Southern Railway hauled 274,122 short tons of bituminous coal during April, 1915, and 1,093,804 short tons during the four months ending Apr. 30.

IMPORTS AND EXPORTS

The following is a comparative statement of coal imports and exports of the United States for June, 1914-15, and for the twelve months ending June, 1913-14-15, in long tons:

	June		Twelve Months		
Imports from:	1914	1915	1913	1914	1915
United Kingdom	341	....	9,398	11,025	33,919
Canada	67,511	85,525	1,336,387	1,005,693	1,121,810
Japan	1,838	11,750	79,072	85,689	89,240
Australia and Tasmania	21,896	21,094	150,150	251,977	182,041
Other countries	5	350	3,257	3,618	2,598
Total	91,591	118,719	1,578,264	1,358,002	1,429,608
Exports:					
Anthracite					
Canada	427,719	352,234	4,545,965	3,897,365	3,621,234
Uruguay	....	5	....	84	5
Other countries	5,546	397	79,505	61,665	60,949
Total	433,265	352,636	4,625,481	3,959,114	3,682,188
Bituminous					
Italy	....	383,019	....	....	1,628,279
Canada	793,856	873,239	11,981,443	11,472,397	8,425,103
Panama	25,810	47,708	483,974	362,427	343,372
Mexico	15,866	22,445	443,884	296,392	391,611
Cuba	81,575	74,984	1,273,945	1,129,954	1,065,206
West Indies	45,433	48,406	601,431	577,541	461,892
Argentina	9,977	157,831	....	139,409	563,889
Brazil	10,023	122,484	....	239,082	527,264
Uruguay	6,200	11,968	....	62,452	103,639
Other countries	196,826	191,326	1,298,424	1,425,312	902,740
Total	1,185,566	1,933,410	16,083,101	15,704,966	14,412,995
Bunker coal	868,736	727,808	7,351,114	7,811,913	7,062,653

I. C. C. DECISION

I. C. C. No. 5638—Plymouth Coal Co., vs. Delaware, Lackawanna, and Western R.R. Co.

Defendant's demurrage regulations governing anthracite coal awaiting transshipment at or near tidewater at Hoboken, N. J., found reasonable.

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

For the official advertisements of bids wanted see the Contracts-to-Be-Let Section on Page 36.

✚Indicates contracts regarding which official information has been received.

Recast

In the following table we give a list of all old contracts coming up for consideration during the ensuing week. The table gives our contract number, the name of the purchaser, city, tonnage and page on which the detail notice appeared.

No.	Purchaser	City	State	Tonnage	Page
1253	Bd. of County Comrs.	Stanley	N. D.		323
1257	Bd. of County Comrs.	Watertown	S. D.	90b	323
1278	Bd. of County Comrs.	Bloomington	Ind.	100b	324
1286	Cass County Bd. of Comrs.	Fargo	N. D.		324
1287	Bd. of County Comrs.	Greensburg	Ind.	175b	324
1290	Dickey County Bd. of Comrs.	Ellendale	N. D.	200b	325
1321	Bd. of County Comrs.	Plymouth	Ind.	280b	361
1322	Bd. of County Comrs.	Brownstown	Ind.		367

a Indicates anthracite coal. b Indicates bituminous.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

1012—Pleasant Hill, Mo.—This contract (pp. 77, 243), which provides for furnishing the George M. Kellogg, Flower & Plant Co. with approximately 100 cars of coal per season has been bid on for southern Kansas, as follows: Slack, $1.35; mill, $1.50; mine-run, $1.75; nut, $1.85; screened lump, $2. Address Pur. Agt. N. F. Parker, George M. Kellogg Flower & Plant Co., Pleasant Hill, Mo.

✚No. 1032—Cleveland, Ohio—The following is a list of bids on this contract (pp. 115, 323), which provides for furnishing the local Board of Education with coal:

Firm	300 Hard	3000 Lump	2500 Nut	25,000 Slack	4000 Mine-Run	4000 Lump
Albright Coal Co.	$6.86	$3.15	...	...	$3.72	$4.34
	7.11	...	...	...	3.62	4.24
	...	...	...	...	3.52	...
	...	...	...	...	3.25	...
Cuyhago Coal Co.	6.87	3.15	...	$2.65	3.47	4.72
	6.87	2.75	$2.44	2.05	3.45	4.72
	7.09	...	...	2.50	3.43	4.72
Cleveland & Pittsburgh Coal Co.	7.25	2.79	2.64	2.49	3.50	4.60
Goff-Kirby Coal Co.	6.68	2.85	2.65	2.55	3.23	4.08
	6.91	2.92	...	...	3.33	4.07
Zettelmeyer Coal Co.	...	...	...	2.15	3.44	4.45
	...	...	...	...	3.59	3.85
	...	...	...	2.30	...	3.90
	...	...	...	...	...	3.95
	...	...	...	2.40	...	...
	...	...	...	2.37½	...	...

The contract has not yet been awarded. Address Dir. of Schools F. C. Hogen, School Headquarters, Rockwell Ave. and East Sixth St., Cleveland, Ohio.

✚1090—Columbus, Ohio—No award has yet been made on this contract (pp. 117, 366), which provides for furnishing the various city departments with coal. Bids of West Virginia operators were lower, but there is a great deal of pressure being exerted to force the contract to Ohio operators. Address Clk. Paul B. Kemper, Pub. Service Com., Columbus, Ohio.

1200—Cincinnati, Ohio—Bids have been received on this contract (p. 244), which provide for furnishing the local Water Works Department with coal as follows: Reliance Coal Co., Filtration Plant, $2.21 per ton; Consolidation Coal Co., Western Hills, $1.99 per ton; Campbells Creek Coal Co., Main Station, 5.875c. per bu. in barge lots, and $2.15 per ton delivered by gawon. Address Asst. Secy. C. A. Zech, Pub. Service, City Hall, Cincinnati, Ohio.

1252—Minot, N. D.—All the bids on this contract (p. 284), which provides for furnishing the schools of the Burlington School District No. 7, with coal have been rejected and the call for bids will be readvertised. Bids were received from J. S. Wallace and the City Coal Co. Address Clk. W. E. Gross, Burlington School Dist. No. 7, Minot, N. D.

✚1301—Pewee Valley, Ky.—Bids on this contract (p. 366), which provides for furnishing the Confederate Home with mine-run, lump and nut coal will be received until Sept. 5. Bids will be considered only on good steam making coal, and are to provide for delivery as required. Address Commandant Henry George, Confederate Home, Pewee Valley, Ky.

New Business

✚1332—Webster City, Iowa—The Board of Education will receive sealed bids until 5 p.m., Sept. 6, for furnishing from 700 to 900 tons of 3-in. Iowa steam coal, and 100 to 300 tons of Iowa lump or 6-in. egg coal. Bids are to include cost of delivery to the school buildings as required. Address Secy. J. M. Blake, Bd. of Edu., Webster City, Iowa.

1333—Edgeley, N. D.—Bids will be received until Sept. 7 for furnishing the High School with lignite coal as may be required during the ensuing year. Bids should include cost of delivery in the basement of the school in carload lots. Address Clk. Ernest Steel, Bd. of Edu., Edgeley, N. D.

✚1334—Parker, S. D.—Sealed bids will be received until 1 p.m., Sept. 8, for furnishing Turner County with approximately 100 tons of the best Virginia lump coal. Address County Audr. O. M. Rasmussen, Parker, S. D.

✚1335—Moberly, Mo.—The Board of Public Works will receive bids until noon, Sept. 3, for furnishing the city waterworks with coal until Apr. 1 of next year. Bids are requested on both mine-run and lump coal, to be delivered in the coal bunkers and storage shed at the plant. Address Supt. C. H. Chamblin, Bd. of Pub. Wks., 212 No. William St., Moberly, Mo.

1336—Washington, Ind.—The Board of County Commissioners at this place will receive bids until Sept. 7 for furnishing a year's supply of mine-run, lump and nut coal. Address County Audr. Lew C. Core, Bd. of County Comrs., Washington, Ind.

✚1337—Wilmington, Del.—The United States Engineer's Office will receive bids until 11 a.m., Sept. 8, for furnishing 3000 tons of bituminous coal. Complete details may be had on application. Address. United States Engineer's Office, Old Federal Bldg., Wilmington, Del.

✚1338—Jackson, Miss.—The Board of Supervisors of Hinds County, Miss., will receive bids until Sept. 6 for furnishing 140 tons of No. 2 lump coal to be delivered in the basement of the courthouse and jail, and also one car of No. 1 lump, f.o.b. Raymond. Address Chancery Clk. W. W. Downing, Hinds County Bd. of Supervisors, Jackson, Miss.

✚1339—Cleveland, Ohio—The Board of Public Service will receive bids until noon, Sept. 9, for furnishing coal to be used at the garbage reduction plant. Complete details may be had on application. For previous notice in regard to this contract see No. 50, Vol. 7, p. 149. Address Dir. A. A. Benesch, Pub. Service Dept., 204 City Hall, Cleveland, Ohio.

1340—Livingston, Mont.—The Board of County Commissioners will receive bids until 10 a.m., Sept. 9, for furnishing approximately 200 tons of lump coal to be delivered as required at the County Court House and jail. The contract will run for one year. A certified check for $200 must accompany each bid. Address County Clk. Chas. A. Burg, Bd. of County Comrs., Livingston, Mont.

✚1341—Great Falls, Mont.—Bids will be received by school district No. 1 until 4 p.m., Sept. 7, for furnishing coal as required by the local schools during the ensuing year. Bids must be accompanied by a certified check for $100, and the successful bidder will be required to furnish a satisfactory bond for $1000 guaranteeing the faithful performance of the contract. Address Clk. H. A. Cary, School Dist. No. 1, Great Falls, Mont.

1342—Boone, Iowa—The Independent School District at this place will receive bids until 3 p.m., Sept. 9, for furnishing and delivering the best grade lump coal as may be required at the several school buildings in the district during the ensuing year. Address Secy. R. T. Duckworth, Independent School Dist., Boone, Iowa.

1343—Brazil, Ind.—The Board of County Commissioners at this place will receive bids until Sept. 7 for furnishing coal as may be required during the ensuing year. Address County Audr. W. O. Graeser, Bd. of County Comrs., Brazil, Ind.

+1344—Irene, S. D.—The County Commissioners will receive bids until 2 p.m., Sept. 7, for furnishing the best screened Hocking Valley coal for the County Court House and jail, during the period beginning September of this year, and ending April of next year. Address County Audr. W. O. Nelson, Bd. of County Comrs., Irene, S. D.

+1345—Rich Hill, Mo.—The Board of Education at this place will receive bids until noon, Sept. 7, for furnishing the city with approximately 4000 bu. of coal to be delivered in the bins of the various school buildings as may be directed. Address Secy. L. C. Stonebraker, Bd. of Edu., Rich Hill, Mo.

1346—Magnolia, N. J.—The local Board of Education will receive bids until 8 p.m., Sept. 8, for furnishing one carload of the best stove coal for each of the public schools on Lincoln and Adams Ave. The carloads are to contain from 25 to 30 gross tons. A certified check for one-fifth of the contract price must accompany all proposals. Address District Clerk, Bd. of Edu., Magnolia, N. J.

1347—Sullivan, Ind.—The Board of County Commissioners will receive bids until Sept. 7, for furnishing the year's supply of coal. Address County Audr. W. S. Bicknell, Bd. of County Comrs., Sullivan, Ind.

+1348—Brookville, Ind.—The Franklin County Board of Commissioners will receive bids until Sept. 6 for furnishing coal as required in the county institutions during the ensuing year. Address County Audr. R. C. G. Reisel, Brookville, Ind.

+1349—Ogden, Utah—The Board of Education at this place usually contracts about Oct. 1 for their annual fuel requirements involving approximately 1400 tons of screened slack coal. The business last year was done at $2.85 per ton delivered at the schools or $2.70 f.o.b. Castle Gate coal is being used on the present contract. Address Bd. of Edu., Hudson Bldg., Ogden, Utah.

+1350—Bluffton, Ind.—The Wells County Board of Commissioners received bids until Aug. 28 for furnishing coal as required at the county institutions during the ensuing year. Address Board of County Commissioners, Wells County, Bluffton, Ind.

+1351—Fowler, Ind.—The Benton County Board of Commissioners will receive bids until Sept. 6 for furnishing 140 tons of anthracite egg coal and 10 tons of bituminous coal to be used at the county institutions during the ensuing year. Address County Audr. Warren Mankey, Bd. of County Comrs., Fowler, Ind.

1352—Kansas City, Mo.—The Security Stove Co. at this place will buy approximately four cars of bituminous coal about Oct. 1. Address H. E. Blakeslee, Security Stove Co., 17th St. and Oakland Ave., Kansas City, Mo.

1353—Petersburg, Ind.—The Pike County Board of Commissioners will receive bids until Sept. 7 for supplying coal required at the poor asylum and county jail during the ensuing year. Address County Audr. John D. Gray, Bd. of Comrs., Petersburg, Ind.

+1354—Albany, N. Y.—The State Hospital will receive bids until 10:30 a.m., Sept. 8, for furnishing the Buffalo State Hospital for the Insane with coal during the six months' period beginning Oct. 1. The hospital requires 25,000 to 30,000 tons per year. Address Purchasing Committee, State Hospital, Room 138, Capitol, Albany, N. Y.

1355—New Orleans, La.—The St. Charles Hotel at this place is requesting bids on their fuel requirements for the ensuing year. Address Secy. Treas. S. A. Trufant. A. S. Amer & Co., St. Charles Hotel, New Orleans, La.

+1356—Storm Lake, Iowa—The Municipal Light and Water Department at this place will contract about Oct. 1 for their annual requirements of coal involving approximately $5700 worth. The coal last year cost $3.54 per ton placed in the bins for 6-in. Iowa lump. Address President Edgar E. Mock, Municipal Light & Water Dept., Storm Lake, Iowa.

+1357—New Kensington, Penn.—The School District will receive bids until 8 p.m., Sept. 10, for furnishing mine-run, lump, nut and slack coal as may be required during the ensuing year. Address Secy. B. F. Davis, School Bd., New Kensington, Penn.

1358—Louisville, Ky.—The Peter & Burghard Stone Co. will contract about Oct. 1 for their annual fuel requirements involving approximately 40 carloads. Delivery will be by wagon, and the grade and quality desired will be decided upon later. Address Peter & Burghard Stone Co., 810 S. 13th St., Louisville, Ky.

1359—Chippewa Falls, Wis.—The County Government will receive bids for furnishing and delivering coal as required during the ensuing year at the County Court House and jail. Bidders must specify the heat value of the coal they propose furnishing. Address Chn. Jos. Nolte, County Court House, Chippewa Falls, Wis.

+1360—Hannibal, Mo.—The Board of Public Works usually contracts about Oct. 1 of each year for their annual fuel requirements involving approximately 12,000 tons of slack coal. The current contract was negotiated at $1.34 per ton f.o.b. tracks at Hannibal. Address Board of Public Works, Hannibal, Mo.

1361—Davenport, Iowa—The Moline Rock Island Manufacturing Co. and the Tri-City Railway & Light Co. usually contract for their annual fuel requirements about Oct. 1. The combined companies consume approximately 75,000 tons of 1¼-in. screening per year. The business is done on competitive bids. Address G. W. Kuhn, Moline Rock Island Co., Davenport, Iowa.

+1362—Hopkinsville, Ky.—The Christian County Board of Education is receiving bids for approximately 10,000 bu. of lump coal to be delivered as required during September and October. Address Superintendent, Christian County Board of Education, Hopkinsville, Ky.

+1363—Berg, N. D.—The Grail School District will receive bids until Sept. 7 for furnishing the local schools with coal as may be required during the ensuing year. Address Clk. A. L. Rothie, Grail School Dist., Berg, N. D.

+1364—Traverse City, Mich.—The Traverse City State Hospital will receive bids until 5 p.m., Sept. 7, for furnishing approximately 7000 tons of a bituminous coal suitable for automatic chain grate stokers; 5000 tons is to be delivered as directed before Jan. 1, and the balance before Apr. 1, 1916. Bidders should specify the grade of coal they propose furnishing and the price f.o.b. track Traverse City, Mich. All bids must be accompanied by an analysis of the coal. Address Steward George B. Pike, Traverse City State Hospital, Traverse City, Mich.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

No. 793—Atlanta, Ga.—This contract (Vol. 7, p. 1005), which provides for furnishing the Georgia Railway & Power Co. with coal for its gas department, has been awarded to the **Harland Coal Co.,** of Pineville, Ky. About 10,000 tons of gas coal will be delivered on the contract this fall. The price has not been made public. Address Mgr. Richard C. Congdon, Georgia Railway & Power Co., Gas Department, Atlanta, Ga.

+No. 873—Springfield, Mo.—This contract (Vol. 7, p. 1086, Vol. 8, p. 233), which provides for furnishing the Board of Education with approximately 1400 tons of screened Kansas lump coal, has been awarded to the **Springfield Coal, Ice & Transportation Co.,** its bid being considered the lowest and best. Address Secy. Edward J. Hoffman, Bd. of Edu., Springfield, Mo.

No. 922—New Orleans, La.—This contract (Vol. 7, p. 1127, Vol. 8, pp. 157, 246), providing for the fuel requirements of the School Board at this place, was awarded to the **W. G. Coyle Coal Co.,** of New Orleans, whose bid was $3.85 per ton for more than 1000 tons of bituminous and $8.35 and $8.45 for 500 tons of egg, and stove and nut, respectively. Proposals were received as follows:

	Coal	Volitile	B.t.u.	Price
Cahaba Red Ash Co.	(Galloway)	34.96	12,856	$3.60
Jung & Sons Co.	(Illinois)	37.28	13,460	4.19
Jung & Sons Co.	(Black Creek)	32.56	15,170	4.37
C. A. Andrews Co.	(Corbon Hill)	....	13,250	3.90
C. A. Andrews Co.	(Sipsey)	....	14,500	3.95
Darsam Bros. Co.	(Ajax)	34.21	13,750	3.90
Darsam Bros. Co.	(Nut)	33.21	13,400	3.75
Tenn. Coal & Iron Co.	(Cahaba)	35.88	14,250	3.82
Pittsburg Co.	(Corbon Hill)	32.50	13,000	3.75
W. G. Coyle & Co.	(Sipsey)	34.11	14,500	3.85
Robert B. Hyams	(Rodin Cahaba)	34.00	14,500	3.85
Robert B. Hyams	(Corona)	....	13,500	3.40

Anthracite—

W. G. Coyle & Co. (egg)	8.35
W. G. Coyle & Co. (stove and nut)	8.45
C. A. Andrews & Co. (egg and stove)	8.60
Darsam Bros. Co. (egg)	8.75
Tennessee Coal & Iron Co. (egg and stove)	8.32
Pittsburg Coal Co. (egg and stove)	8.50
Pittsburg Coal Co. (nut)	8.75
Robert P. Hyams Coal Co.	8.75

Address Purchasing Agent, New Orleans School Board, flourth floor, Municipal Bldg., New Orleans, La.

+No. 960—Harriman, Tenn.—This contract (p. 41), which provides for furnishing the Harriman Water and Light Department with its coal requirements during the ensuing year, involving approximately 2160 tons of coal, has been let to **Church & Co.** Address R. Walzl, Harriman Water and Light Department, Harriman, Tenn.

1057—Superior, Wis.—This contract (p. 116), which provides for furnishing the Board of Education with its annual supply of coal, involving approximately 2500 tons of lignite, has been awarded to the **Donley Dray & Storage Co.** at $2.89 per ton. There were 15 other bidders on this business, all of whom quoted $3.50 per ton. Address Secy. L. A. Nichols, Bd. of Edu., Superior, Wis.

+1076—Ashtabula, Ohio—As previously noted, this contract (pp. 117, 325), which provides for furnishing the local Board of Education with coal and water, has been awarded to the **Ashtabula Coal Co.** at $2.58 per net ton delivered. Bids were received on the contract as follows: Crystal Ice Co., Oakdale, $2.62½ per ton, Moon Run $2.62½, Bessemer $2.30, thick vein $2.55; M. C. Robinson, Oakdale, $2.60, Clifton $2.50, Moon Run $2.70, Prior Penobscot $2.40; F. C. Horton, not specified, $2.53; Aten Coal Co., Oakdale, $2.75; **Ashtabula Coal Co.**, Oakdale, $2.58; not specified, $2.52. Address Clk. Charles E. Peck, Bd. of Edu., Ashtabula, Ohio.

+1089—St. Louis, Mo.—This contract (p. 117), which provides for furnishing the Water-Works Department with approximately 34,000 tons of egg coal and 37,000 tons of screening, has been awarded to **Donk Bros. Coal & Coke Co.** at the prices noted in the accompanying table. Complete list of bids received, including cost of delivery with the freight rate of 57½c. per ton, was as follows:

	Lump	Egg	Screenings
Donk Bros. Coal & Coke Co.	$1.47	$1.44	$1.13½
St. Louis & O'Fallon Coal Co.	1.72½	1.77½	1.37½
Southern Coal, Coke & Min. Co.	1.62½	1.62½	1.32½
Polar Wave Ice & Fuel Co.	....	1.52½	1.27½
Boehmer Coal Co.	1.55½	1.54½	1.14½

Address Board of Water Commissioners, St. Louis, Mo.

1099—Jefferson City, Mo.—The State Commissioners of Missouri have awarded to **John W. Riner**, of Jefferson City, the contract for furnishing coal to the various state departments for the fiscal year beginning Oct. 1 (p. 157). His bid was $2.89 a ton f.o.b. Missouri Pacific cars at Jefferson City. The specifications called for No. 2 Carterville washed nut coal or its equivalent. The Southern Coal, Coke & Mining Co., St. Louis, offered to supply Southern Sootless No. 2 at $2.65. The other bids were as follows: Bald Eagle Mining Co., St. Louis, $2.95; West Virginia Coal Co., St. Louis, $2.92½; J. C. Johnson, Jefferson City, $3; Peabody Coal Co., Chicago, $3; Devoy & Kuhn Coal Co., St. Louis, $2.97; Chicago, Wellington & Franklin Coal Co., Chicago, $2.95. The contract was let last year at $2.97½. Address Secy. Cornelius Roach, Com. of Gov., Jefferson City, Mo.

1101—Urbana, Ohio—This contract (p. 157), which provides for furnishing the county commissioners with coal, has been awarded to the **Gaumer Coal Co.** Address County Audr. O. E. Eby, Bd. of County Comrs., Urbana, Ohio.

+1108—Sharpsville, Penn.—This contract (p. 157), which provides for furnishing the local School Board with 150 to 200 tons of coal, has been awarded to **C. B. Kantner** at $2.35 per ton for Pittsburgh ¾-in. screenings. Coveret & Stewart bid $2.38 and Eckles & Boyd $2.35 for the same fuel. Address Secy. H. B. Wert, Sharpsville Dist. School Bd., Sharpsville, Penn.

+1111—St. Joseph, Mo.—This contract (p. 157), which provides for furnishing the local Board of Education with approximately 4000 tons of coal, has been awarded to the **Central Coal & Coke Co.** at $3.10 per ton for 1¼-in. shaker screen coal from Beaver, Mo. The cost includes delivery to schools. This contract last year was filled at $3.17 per ton. There were eight other bids on the business. Address Secy. A. L. Loving, Bd. of Edu., St. Joseph, Mo.

+1112—Natrona, Penn.—This contract (p. 157), which provides for furnishing the Harrison Township School Board with coal, has been awarded to **Edward Koenig**, at 8c. per bu. for nut coal. Address Secy. Percy M. Kennedy, Natrona, Penn.

+1117—Rockville, Ind.—This contract (p. 158), which provides for furnishing the local School Board with approximately 5000 bu. of coal, has been awarded to **Henry Kinney**, at $2.20 per ton for 4-in. screened coal. Address Secy. O. M. Teague, Bd. of Edu., Rockville, Ind.

1120—New Orleans, La.—This contract (p. 158), which provides for furnishing local school board with its coal requirements during the ensuing year, has been awarded to **W. G. Coyle & Co.**, of this city, at $3.85 for bituminous and $8.35 to $8.45 for anthracite. Address Secy. E. A. Williams, Bd. of Edu., Municipal Bldg., Carondelet & Lafayette St., New Orleans, La.

Contract Notes

Globe, Ariz.—The contract for furnishing the Copper Queen Mining & Milling Co. with 200 tons of coke per day has been awarded to the **Victor American Fuel Co.**

Louisville, Ky.—The Peerless Mfg. Co. at this place consumes from four to six cars of bituminous nut and slack per month. Deliveries are made by railroad and they have a storage capacity of two cars.

Rumford Falls, Me.—The several mills of the International Paper Co., at this place, are substituting oil for coal, the first cargo of oil having already arrived. Other paper mills in this vicinity are expected to follow suit.

Hampton Roads, Va.—Among contracts recently closed here was one for supplying the interned German cruiser "Wilhelm" with about 1000 tons which is to be used for cooking purposes, refrigeration, etc., while the ship is at the dock.

Pawtucket, R. I.—The contract for the Lorraine Mfg. Co., involving 12,000 tons of New River and buckwheat coal per annum (p. 246) should have stated that deliveries were at the rate of 1000 tons per month instead of 100 tons. Address, W. H. Jollie, Lorraine Mfg. Co., Pawtucket, R. I.

Philadelphia, Penn.—The North Bros. Co., consumes about 50 tons of bituminous coal per month. Deliveries are made by railroad, and they have a storage capacity of 300 tons. Address, Purchasing Agent, North Bros. Manufacturing Co., Lehigh Ave. and American St., Philadelphia, Penn.

Saginaw, Mich.—The Arlington & Curtis Mfg. Co., at this place, consumes about 45 tons of mine-run coal per month. Deliveries are made by railroad and wagon, and mine-run coal from Saginaw mines is used. Address, Purchasing Agent, The Arlington & Curtis Mfg. Co., Holden, Saginaw, Mich.

Philadelphia, Penn.—The Sanquirt Silk Mfg. Co. consumes about 3500 tons of No. 2 buckwheat per annum. Their storage capacity is 1000 tons and the deliveries are made by railroad at the rate of 250 to 300 tons per month. Address Pur. Agt. L. G. Schlehner, 4015 Clarissa St., Philadelphia, Penn.

Tacony, Penn.—The Ross-Tacony Crucible Co. of this place consume about 100 tons of bituminous, 1100 tons broken and 300 tons buckwheat coal per annum. They have a storage capacity of 200 tons and deliveries are made by railroad. Address Purchasing Agent, Ross-Tacony Crucible Co., Tacony, Penn.

Philadelphia, Penn.—The Quaker City Flour Mills consume approximately 7500 tons of buckwheat coal per annum. Deliveries are made by railroad, and their storage capacity is 300 tons. They have no specific time for contracting. Address, Pur. Agt. L. G. West, Fourth and Market St., Philadelphia, Penn.

St. Bernard, Ohio—The M. Werk Co. at this place consume from 5000 to 6000 tons of nut and slack coal per annum. Deliveries are made by railroad at the rate of 100 to 150 tons per week, and they have a storage capacity of 200 tons. Address Pur. Agt. A. G. Schwartz, care of The M. Werk Co., St. Bernard, Ohio.

Philadelphia, Penn.—The Philadelphia Sash Weight Works at this place consume about 50 tons of anthracite pea and 100 tons of 72-hr. Connellsville coke per annum. They have a storage capacity of 80 tons and the coke is delivered at the rate of 21 tons per week via the Pennsylvania R.R. Address Purchasing Agent, Philadelphia Sash Weight Works, 22nd and Glenwood Ave., Philadelphia, Penn.

New Orleans—The contract for furnishing the New Orleans Custom House with coal for the fiscal year ending June 30, 1916, was awarded at $3.15 per long ton. As noted in the previous issue (p. 246), the contract went to the **Robt. P. Hyams Coal Co.** Other bidders on the contract were: Tennessee Coal, Iron & R.R. Co., $3.38; Jung & Sons Co., $3.38; C. A. Andrews Coal Co., Ltd., $3.25; Pittsburgh Coal Co., $5.65. The contract involves approximately 1200 long tons and the successful bidder agreed to furnish coal having a B.t.u. value of 13,800 "as received." Address, the New Orleans Custom House, New Orleans, La.

Atlanta, Ga.—Bids on the contract for supplying the local water-works department with approximately 18,000 tons of coal ranged from $2.27½ to $2.75 per ton, which is considerably lower than last year's figures. The bids were submitted by eight firms as follows. R. O. Campbell Coal Co.; Brushy Mountain Coal Co.; Tennessee & Southeastern Coal Co.; Sewanee Coal Co.; Randall Bros. Coal Co.; Atlantic Ice & Coal Co.; Continental Coal Co., and the Durham Iron & Coal Co. The samples submitted are now being tested, and contracts will be awarded according to their merits. Address, City Pur. Agt. W. E. Chambers, Atlanta, Ga.

COAL AGE

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Be A Sport!

By BERTON BRALEY

LET'S be good sports about it. About what? About everything, business, life, work, love and play.

There isn't any better recipe for living than that, anyhow.

Because the good sport accepts life as it is, tries to make it better, takes good fortune gratefully and bad fortune bravely and never loses heart.

So let's be good sports.

Business isn't as flourishing as we wish, perhaps, but we won't improve it by grouching or by being in a blue funk. In fact, we make it worse.

Let's be decently cheerful about it and determined that it must be better.

And if enough of us feel that way, it will be better, because that's the psychology of trade.

The way the average American business man has been sitting forlornly at his desk and grumbling over hard times and the war has been a great disappointment to those of us who thought that he would go out and gather in the trade of the world while the other nations were endeavoring to obliterate each other.

There wouldn't be anything unsportsmanlike in going after that business.

If Bill Smith and Tom Jones, who have been selling potatoes to Dick Brown, suddenly mix it in the street and use up all their potatoes as weapons, Dick Brown still needs potatoes and Jim Black isn't a bum sport if he supplies Dick.

But he's a mighty bad business man if he sits by with his own wagon full of potatoes, and moans, "Oh dear, oh dear, the potato business has all gone to pieces! Look how Bill and Tom are throwing them away."

Let's stop fussing and fretting and muttering, let's wake up and perk up, play the game, go after the prize.

Let's be good sports.

Herbert Mine of the Connellsville Central Coke Company

SYNOPSIS—At a mine in the coke district of Pennsylvania the output of 700 cars was formerly hauled by 29 horses. A gasoline locomotive was installed, and the output was thereby increased to 850 cars, despite the fact that 5 horses and 3 drivers were dispensed with and the haulage distance was increased. Another locomotive has been installed to increase both the output and the efficiency of the haulage system.

The Herbert mine of the Connellsville Central Coke Co., at New Salem, on Dunlaps Creek, Fayette County, Penn., produces about 1700 tons of coal per day, and about 650 tons of coke are produced in 210 rectangular ovens, 105 of which are drawn daily. All the coal mined which is not used for making coke in the 210 rectangular ovens at Herbert is shipped a distance of two miles to the Connellsville Central Coke Co.'s "Low Phos." works and coked in the 210 beehive ovens at that plant.

HERBERT MINE OF CONNELLSVILLE CENTRAL COKE CO. AT NEW SALEM, FAYETTE COUNTY, PENN.

The mine is equipped with 386 Wolf safety lamps and is classed by the inspection department as a gaseous operation. It is ventilated by a Clifford fan, 18 ft. in diameter and 8 ft. wide. At 70 r.p.m. this fan will deliver 185,000 cu.ft. of air per min. It is driven by direct-connected Porter-Allen engines. The power plant is equipped with two 100-kw. 250-volt direct-current Westinghouse generators direct-connected to Ball engines. The air for two Sullivan and eight Ingersoll coal punchers is compressed in two 24&14½x22x24-in. Norwalk air compressors of 1380 cu.ft. per min. capacity compressing the air to 100 lb. pressure.

The boiler plant is equipped with six Phoenix and two Titusville boilers having an aggregate output of 1200 hp. The hoisting engine was manufactured by the Vulcan Iron Works and has cylinders 24 in. in diameter with 48-in. stroke. The hoisting drum measures 8x10 ft. and operates self-dumping cages.

The steel tipple was built by the Fort Pitt Bridge Works, of Pittsburgh, Penn. It has a capacity of 2000 tons per 9-hr. day. Everywhere the equipment is substantial. The offices and the commissary form together a large two-story building 48 ft. wide and 76 ft. long.

The Former Haulage System

With this equipment the haulage system was strangely in contrast. Twenty-nine horses hauled the output of 700 cars, to the haulage rope or to the shaft bottom as the case might be. The coal from some of the flats was handled independently of the haulage rope. This represented a net tonnage of only 41.5 tons per horse, the tonnage per unit being low, not only because of the excessive length of haul, but because of the heavy grades. These averaged 6.5 per cent. in the butt headings. The situation evidently needed corrective treatment.

The mine was by no means small, each of the flats being as extensive as small mines in themselves with most of the coal being drawn in retreat from the boundary lines of the property. The early operations had consisted of heading and room driving, the rooms being only about 12 ft. wide and being spaced at 80-ft. centers.

The main haulage is supplied by a 24x36-in. first-motion single-drum Vulcan haulage engine which handles 24-car trips from the various flats. The rope runs up the manway and down the main road.

Four hundred mine wagons are used in hauling the coal. These are of 44-in. track gage and have a capacity of approximately 4000 lb. per car. The cars weigh when empty about 2000 lb. As the daily output is 1700 tons, it is about twice the capacity of the mine cars.

On all main haulageways 40-lb. rail is used, and on the flats and subsidiary butts the rails weigh 25 lb. per yd. The joints are all fishplated, and the track is well ballasted and carefully graded.

To increase the output, John C. Neff, the general manager, purchased a gasoline locomotive, a 5-ton machine of that type having been successfully operated in a mine under his direction at Crucible, 2 mi. north of Rice's Landing, Greene County, on the west bank of the Monongahela River.

That locomotive had given complete satisfaction. Writing to the editor in reply to an inquiry on Oct. 19, 1914, Mr. Neff stated that the gasoline locomotive "is a great revelation in the economic haulage and safe operation of mines wherever the grades permit it to be worked." He also stated that the locomotive had done more than had been claimed for it and had exceeded his expectations.

There were some special reasons in favor of the gasoline locomotive at the Herbert mine, but its adoption was not based so much on these special conditions as on the excellent performance of the locomotive at Crucible. At the Herbert mine the introduction of electric mine locomotives would have involved increasing the power plant, wiring the mine and bonding the rails. This would have been more expensive than purchasing gasoline locomotives. The purchase and installation of compressed-air locomotives would have been a still larger investment.

Furthermore, had electric locomotives been used it probably would have been necessary to change the ventilation so that the haulage could be conducted on intake air. It had been customary to use the return for a haulageway, and this is the plan under which the gasoline locomotive gives the best results.

The headings are nowhere less than 6 ft. high and are usually higher. In these roadways of course the gas is not allowed to gather, but if it should, it would be unlikely to descend to the level of the locomotive. An electric locomotive discharges sparks liberally near the roof, and if there is any gas to ignite it can hardly fail to set that gas on fire. But for ignition to occur with a gasoline locomotive the gas must be found near the level of the cylinders and the whole roadway must be in a most dangerous condition.

Relative Safety of Gasoline Engine

The danger of gas ignition has been safeguarded by every known method in the design and building of the gasoline locomotive, installed in the Herbert mine. Of course every locomotive will make sparks when starting on a sanded rail or when the brake is operated, but apart from this risk these gasoline locomotives are not likely to set fire to gas even when present in dangerous quantities.

The exhaust would of course constitute a danger, but in this locomotive it is carried direct from the engine to a deodorizing tank, which at the option of the mine inspector can be run empty or filled with water. If the inspector considers that the mine is very gaseous and operation is dangerous, this deodorizing tank can be filled with water, and thus the exhaust from the engine can be prevented from reaching the atmosphere till it has been cleaned by a water bath. Thus all carbon is eliminated and no flame can possibly issue from the exhaust.

The fact that the mine was not new had no bearing on the decision to install a gasoline locomotive, though the older a mine the more forcibly is the purchase of such equipment indicated. The narrowing area to be mined and the great expense of installation of any system needing to be supplied with power from the power house, all argue for detached units such as gasoline locomotives. But as stated, the choice was not made owing to these facts, for at the Crucible Fuel Co.'s plant the area to be mined is 4500 acres and the plant was entirely new, yet the gasoline locomotive was introduced. Had the manager preferred some other form of haulage, it could have been readily installed.

The gasoline locomotive selected was manufactured, like that in operation at the Crucible Fuel Co.'s plant, by the Milwaukee Locomotive Manufacturing Co. The first supplied was a 5-ton machine which was shipped to the mine Sept. 29, 1914. It pulls 15-car trips in No. 5 flat right and 20-car trips in F flat on the left, the latter being a one-way haul of approximately 2000 ft. and the other being roughly half that length. The cars are delivered to the rope at the main butt entry.

Grades Partly Against the Load

The grades on both headings are partly in favor and partly against the load. Thus in the No. 5 flat there is a grade which averages 1¾ per cent. against the load extending for the whole distance between two of the butt entries, and in F flat there is a grade averaging about 1.2 per cent. against the load and nearly 1200 ft. long. It is easy to see that conditions more favorable might have been chosen. The operating expenses are as follows:

HEADFRAME, BOILER, POWER HOUSE AND STORAGE BIN AT HERBERT MINE

Locomotive runner per 9-hr. day	$2.75
Trip-rider per 9-hr. day	2.60
11 gal. of gasoline at 12c. per gal	1.32
¼ gal. lubricating oil at 22c. per gal	.06
Cup grease, waste, oil, etc	.05
Total	$6.78

The results obtained from this locomotive were so satisfactory that a duplicate was purchased and shipped to the mine, Jan. 28, 1915. The locomotive is working in C flat on a haul which measures one way 2700 ft. and in D flat where the haul is 3000 ft. one way. Both flats have grades favorable to the load. However, in D flat is a grade about 300 ft. long which runs about 1.1 per cent. against the load. At present each of these locomotives is hauling about 250 loaded cars per day, and handling about 500 tons. It is expected that when certain grades are made more even and when delays are eliminated 300 wagons loaded with 600 tons will be handled by each unit.

For the months of April and May, 1915, the locomotive in F flat and No. 5 right averaged 260 wagons daily, and on this basis the comparative haulage costs per day are as follows:

COMPARATIVE HAULAGE COSTS

Horse haulage:		
11 drivers at $2.60		$28.60
Feeding 11 horses at 50c		5.50
		$34.10
Motor haulage:		
6 drivers at $2.60	$15.60	
Feeding 6 horses at 50c	3.00	
1 motorman	2.75	
1 snapper	2.60	
Gasoline, oil, grease, etc.	1.51	
		25.46
Saving per day accomplished by use of gasoline motor		$8.64

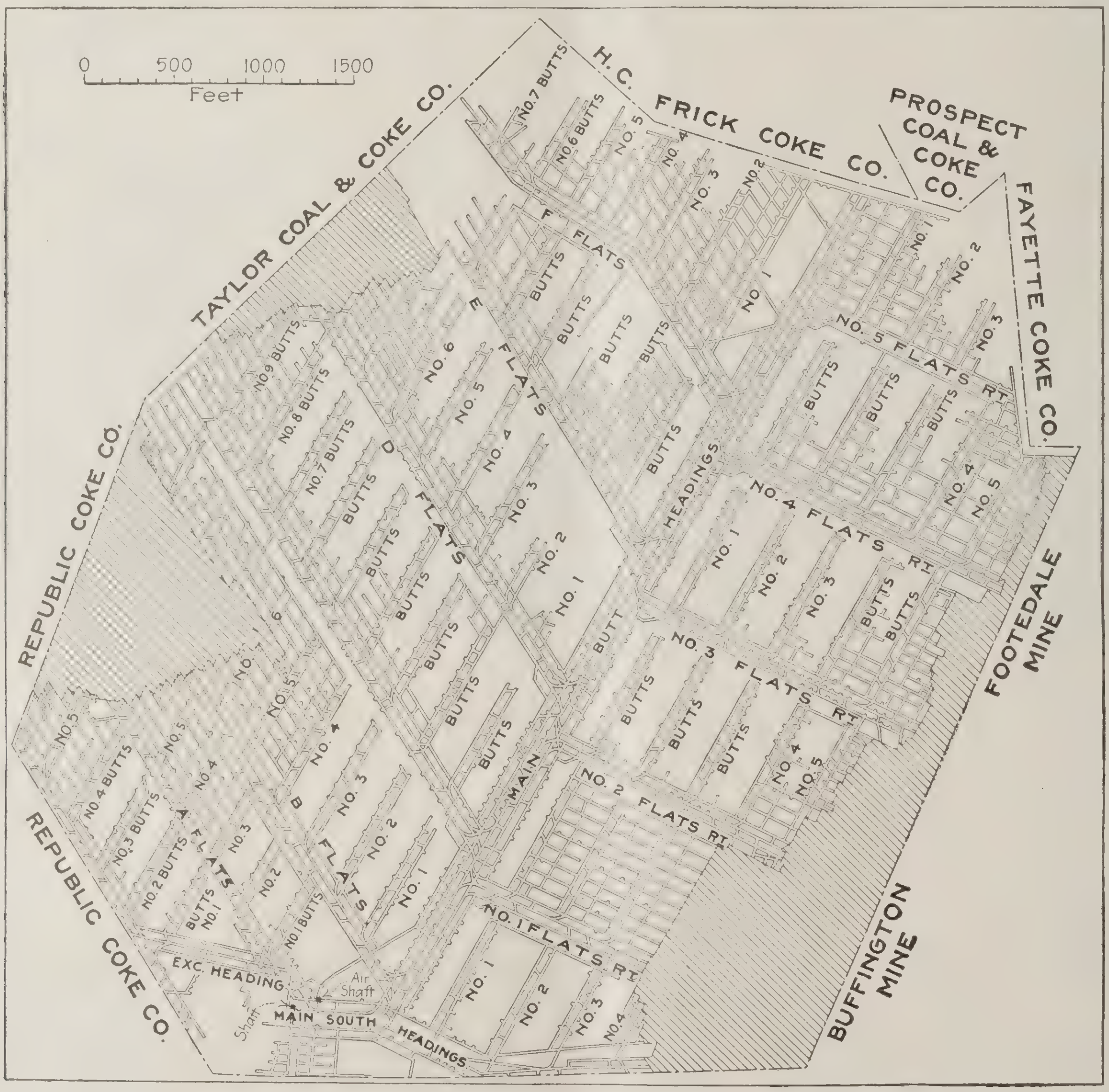
The locomotives when fully equipped weigh 10,500 lb. Overall they are 144 in. long, 55 in. wide and 46 in. high. Their wheels are 18 in. in diameter. The frame is of the open-bar steel type with deep face and steel end sills and with four coupler pockets on each sill. These pockets measure 7½, 10¾, 14¼ and 18 in. from the top of the rail to the pocket centers.

The locomotives are each equipped with 5x6-in. four-cylinder four-cycle engines of the vertical type, specially designed for mine-locomotive service and capable of delivering 25 hp. to the wheels at 800 r.p.m.

The engine is over the front axle, away from the operator, and drives a two-speed transmission direct through a universal coupling. Both the upper and lower sections of the engine crankcase are particularly massive in design and so constructed as to provide ease of access for the inspection and adjustment of the connecting rods and crankshaft bearings.

The transmission drives the rear axle through spur gears and is equipped with two friction clutches—one for forward and one for backward travel.

An electric generator provides current for both the ignition and lighting system, and is driven by a cross-shaft on the gear end of the engine, which permits it to be placed in a readily accessible position. A storage battery furnishes the current for the lighting system when the engine speed is low, and also supplies current for starting the engine. The voltmeter and fuse box with fuses for the protection of the headlights, together with a switch for controlling their operation, are conveniently located on the operator's end plate. The headlights, one at either end of the locomotive, are inclosed in cast-iron cases to protect them from injury, and a plug connection with an extension cord for an operator's trouble lamp is also provided.

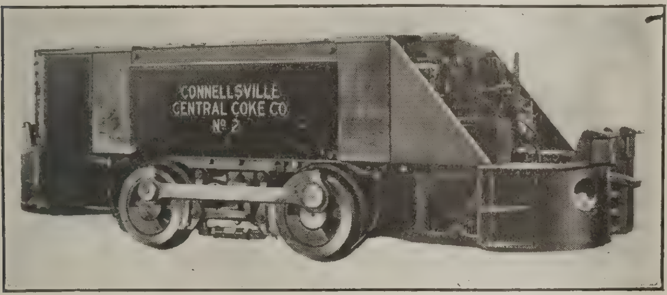


UNDERGROUND OPERATIONS OF CONNELLSVILLE CENTRAL COKE CO.

The cooling system consists of a radiator of special design and rugged construction and a conveniently located centrifugal water pump by means of which the water is kept in circulation and effectively cooled.

A detachable ratchet lever provides means for starting the engine. A safety starting device is also provided and is so designed as to protect the operator when cranking the engine in case of accidental backfire. This device consists of heavy pawls which engage in the rim of the flywheel and are automatically thrown into engagement when the operator throws in the starting crank. With this device, it is impossible to crank the engine without having the safety device engaged, and therefore no accidental backfire can cause any harm to the operator.

The special features in the construction of the locomotive are its open bar steel frame; its steel end sills; a four-cylinder vertical engine weighing 1800 lb. specially designed and built for this service; electric headlights and operator's lamp, with Edison storage battery and a heavy and reliable type of generator so constructed and arranged that lights are operated under all conditions, not only when the locomotive is in operation, but when the engine is running and the machine standing idle, and also when the engine is entirely shut off; a deodorizing tank embodied in the end sill of the locomotive by which the exhaust gases are neutralized; the safety cranking device whereby the operator is effectively protected against back kicks; a radiating system so efficient that these machines can be operated for three or four days at a time with a loss of not to exceed 1 qt. of water; gear and side-rod drive throughout, not a chain being used for power transmission. All the bearings and working parts of the locomotive are of exceptionally heavy and rugged construction and were especially designed for mine service.



TYPE OF GASOLINE LOCOMOTIVE INSTALLED AT HERBERT MINE

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Extracts from a Superintendent's Diary

For several months past we have had only enough demand for our coal to provide our men four days' work each week. On the two idle days they have wandered around like the Lost Tribes of Israel—now at the commissary, next at the railroad depot, then at a game of quoits or marbles at the ball grounds. Some have tried their hand at ball playing, but outside of the regular ball team very few of the men get much pleasure out of base ball, except when they are allowed to act as spectators. For the benefit of that crowd our regular team made strenuous efforts to get up a game with some of our rival neighbors, but the idle days at the different camps seem always to criss-cross.

Some of the men with gardens in their back yards have stuck around home mostly, and some of the others have hung around home pretty much also, much to the disgust of their wives, who would rather have them at work, especially since they grumble so much about the troubles they are going to have making ends meet.

I have been keeping pretty close tab on the doings of the men during the idle days and have come to realize more and more the necessity of devising some plan to furnish them work or amusement to keep their minds occupied while out of the mines. I have considered every suggestion that anyone has been kind enough to offer, and I have watched closely the results my neighbors have accomplished in dealing with the same problem. Last week one of our timber contractors suggested that we might turn all of our men and mules loose in a fallow field that is on company property about one mile from our camp and convert it into a turnip patch.

As a direct result of that suggestion, today has been a day that will be remembered a long time by most of the men, women and children of our camp. Curiosity to know what the mine mules would do when harnessed to plows was sufficient inducement to bring out most of the population, and once on hand as spectators, most of them could not resist the call of the earth, but had to try their hands.

We borrowed the necessary farm implements from our timber contractors, who, as it happens, are all farmers, and with plenty of mules and labor to spare the waste acres were quickly transformed into a planted field.

It proved to be a day of great fun for all who turned out, and the fun started early and continued throughout the day. Even if the seeds refuse to sprout and not a turnip plant raises its head above the ground, no one will regret the day's toil.

The mules also seemed to enter into spirit of the affair, and in spite of the years that must have passed since most of them were taken away from the farms where they were born, led off when put into harness in front of a plow, just as if plowing was everyday work for them. This was rather disappointing to some of the small boys who had looked forward to "Maud stunts" from some of the contrary mules with reputations to sustain.

A few more days like today and we would have enough turnips in prospect to supply the entire neighborhood during the coming winter. And the best part of it is that nearly every citizen of the camp would have an interest in the returns—a regular family affair, as it were.

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Wanted--An Engineer

Important and responsible mining interests wish to employ a safety and efficiency engineer who is thoroughly experienced and fully acquainted with general mining conditions in the United States. The man desired must be entirely familiar with all devices of life-saving practice such as are adapted for the prevention of accidents in and about mines.

Anyone who feels qualified to make application for this position should write to the Editor of *Coal Age,* stating briefly his experience and training in the lines designated. All applications will be kept in strictest confidence and will mmediately be submitted to the people desring such a man.

Power-House Chimneys for Steam Sizes of Anthracite

By Reginald Trautschold, M. E.*

SYNOPSIS—The draft required to burn coal may be divided into three parts—(1) that necessary to force the proper amount of air through the grates and fire bed, (2) that necessary to pull the products of combustion through the boiler, economizer and breeching to the base of the stack, and (3) that necessary to propel the gases up the stack and eject them. Much larger and higher stacks are required for buckwheat No. 3 than are necessary for pea coal.

About a hundred years ago it was not believed that anthracite coal could be burned. The first anthracite taken to Philadelphia, in 1803, defied all attempts at ignition and was finally broken up to furnish material with which to build a walk. A few years later, when Col. George Shoemaker sold a few wagon loads of it to some of the more advanced, or it might have been more ignorant, Philadelphians, warrants were issued for his arrest on the charge of taking money under false pretenses.

Today close to 100,000,000 tons of anthracite are mined in a single year, a large proportion of which is burned for power generation. So valuable has become this coal supply that only the smaller sizes can now be afforded for power purposes. Pea is about the largest size now burned under steam boilers, and within recent years even buckwheat No. 3 has become quite a common steam fuel.

Anthracite Is Burned Uneconomically

There is no question as to the ability of burning anthracite today, but there is a decided question as to whether much of the anthracite that is now consumed is burned economically or efficiently. To burn the steam sizes successfully, without the assistance of mechanical draft, requires chimneys of considerable height. The necessary stacks are far higher than any that could have been conceived a hundred years ago. The pioneers in the burning of anthracite would have considered a chimney of over 700 ft. in height, such as that of the Woolworth Building in New York City, even more of an impossibility than the burning of the supposedly incombustible material that they had been beguiled into buying.

Such a chimney is, of course, exceptional, and it is doubtful if this height record will again be equaled, except in some other skyscraper that permits such construction without unduly exorbitant cost, for the intensity of the draft secured by such a tall stack can be realized at a much lower initial cost by the installation of some kind of mechanical-draft equipment. Many power houses still depend entirely upon natural stack draft, however, and it would be little exaggeration to say that there is more money wasted in chimney construction than in any other equipment pertaining to the power house. Much of this waste cannot be avoided, it is true, but the correct design of chimneys is such an important consideration that any investigation of the subject is decidedly worth while.

A chimney is nothing more than an inefficient type of air pump that is affected by numerous conditions over which little control can be exercised. For instance, in localities where the temperature may drop to zero in the winter and approach the 100-deg. mark in the summer, the natural stack draft would be only about one-half as great on the hot day of the year as on the coldest day of the winter season.

This peculiarity possesses an actual advantage, however, for the chimney having perforce to be proportioned for adequate capacity in the summertime can usually accommodate the extra fuel that has to be burned in the winter for heating purposes without exceeding its capacity. Nevertheless this constitutes a waste, or inefficiency, since during the greater part of the year the chimney has to be operated far below its capacity.

The intensity and direction of winds also have considerable influence on the natural stack draft, with no redeeming advantage that can be counted upon. The shape of the stack and the material of which it is constructed also affect the available draft that a chimney can create. All in all, correct chimney design is an intricate matter—one that must necessarily be based on the most trying conditions that may exist and which perforce makes every chimney an inefficient piece of equipment.

What a Chimney Must Do

The work imposed on a chimney may be divided into two kinds: (a) It must create a draft sufficient to draw the requisite quantity of air through the firebed, draw the products of combustion through the boiler, fuel economizers or other heat reclaiming equipment, and through the breeching to the base of the stack. (b) It must produce the draft necessary to carry the products of combustion up the chimney and discharge them to the air.

The first requisite is dependent upon so many variable conditions as always to be a matter of conjecture when laying out a plant. In fact, even after a plant has been in actual operation and this value becomes known for certain conditions, these conditions can never be fixed, so that the furnace draft always remains decidedly unstable.

The draft necessary to carry the exhaust gases up the chimney also depends upon unreliable conditions—climate, temperature, winds, etc.—which require differing temperatures for the gases of combustion on delivery to the stack, if the draft is to remain constant. It is no wonder, therefore, that many power-house chimneys are inefficient—inefficient in being more powerful than necessary to meet economically even the trying demands made upon them.

If the grates are kept in good operating condition, the firebed free from undue accumulation of ashes, etc., the heating surfaces of the boiler and all passages to the base of the stack clean, the intensity of draft required for drawing the products of combustion through the furnace, or the furnace draft, depends upon the kind of fuel consumed and the rate of its combustion. Ordinarily, the smaller the coal the greater the draft required. For instance, considerably higher draft is required to burn buckwheat No. 3 than would be necessary to burn pea at the same rate of combustion. The increase necessary is pretty accurately known for average conditions, as is also the draft required to burn buckwheat Nos. 1 or 2 at the same rate.

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*Engineering economist, 42 Bank St., New York City.

The furnace draft needed to successfully burn any of the four steam sizes of anthracite may be considered as being required for two distinct operations—first, to draw the required amount of air through the grates and firebed into the combustion chamber and, second, to draw the products of combustion from the combustion chamber to the base of the stack.

The draft necessary for the first operation depends upon the size of coal consumed and upon the rate of combustion. For the second operation, the draft in the average well-designed and proportioned boiler is fairly constant at a given rate of combustion for boilers either with or without fuel economizers or other waste heat absorbing devices.

Furnace Draft May Be Accurately Computed

The furnace draft may be pretty accurately calculated for any well-designed boiler. The draft required to carry the exhaust gases up the chimney, though considerably less than that needed to draw them to the base of the stack, is nevertheless quite an appreciable proportion of the total draft.

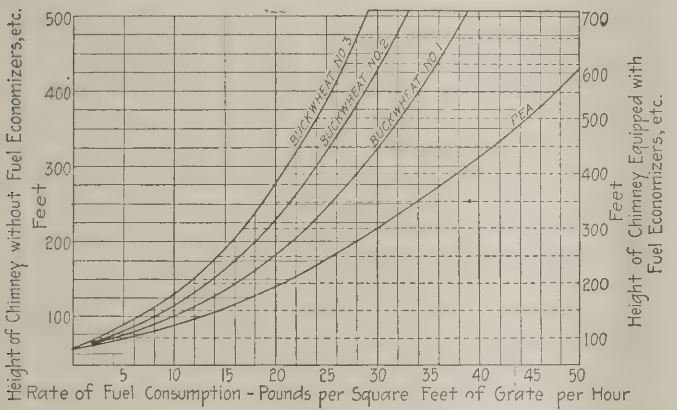

CHART 1. HEIGHT OF CHIMNEY REQUIRED FOR VARIOUS RATES OF COMBUSTION

The draft required to move the gases from the combustion chamber to the base of the stack, other conditions remaining the same, depends upon the temperature of the gases on delivery to the stack. This temperature in turn depends upon the efficiency with which the boiler is operated. It should therefore be taken as that temperature occurring under the best operating conditions, and may consequently be considered as fixed.

The total draft (natural) is dependent, of course, upon the height of the chimney, or the difference in elevation between the fuel bed and the top of the stack. This height consists of the sum of the heights necessary to create (a) the draft requisite for drawing the products of combustion from the combustion chamber to the base of the stack. This is a certain constant height for boilers with fuel economizers, etc., at a given rate of combustion and another fixed height for boilers without such heat reclaiming devices, and in either case is quite independent of the kind of fuel consumed. (b) Another height is necessary for the creation of the draft required to draw the requisite air through the firebed, etc. This depends upon both the rate of combustion and upon the size of coal burned. (c) Still another height is required for creating the draft necessary to elevate the products of combustion from the base to the top of the stack. This height must necessarily be taken as fixed and therefore that required during the hottest day of the year.

Ordinarily these three subheights are not calculated, empirical formulas being employed for arriving at the total height of stack. Probably such practice is justified by the fact that, at best, calculated heights must be liberal in order to meet the most exacting conditions that are liable to arise.

Based on results from a conservative formula for ascertaining chimney heights, checked and modified so as to accord with results attained in actual practice, the necessary heights of chimneys for various maximum rates of consumption of the four sizes of anthracite steam coals are graphically depicted in Chart 1. The data so presented is conservatively accurate for installations in most localities in the United States, but where the summer temperature is apt to go above 100° F., slightly higher chimneys should be employed.

A Chimney Less Than 60 Ft. High Is Useless

Some interesting points are brought out by this graphic presentation of facts, which are too seldom realized. For instance, if steam sizes of anthracite are to be used in a power house and no mechanical draft equipment is installed, a chimney less than 60 ft. in height is practically valueless, even if fuel economizers are not installed. If fuel economizers are employed, the chimney would have to be nearly 85 ft. in height before any fuel could be burned on the grates; the installation of such heat-reclaiming devices adds something like 37½ per cent. to the necessary height of the chimney.

The most striking fact brought out by the chart is, however, the alteration necessary in height of chimney when changing from the use of one grade of fuel to one of lower grade. As an example, if a plant without fuel economizers is to be operated on pea consumed at a maximum rate of 25 lb. per sq.ft. of grate per hour, the chimney necessary to produce the requisite natural draft would be about 175 ft. in height. Should it be advisable to change the plant fuel and burn buckwheat No. 3, the height of chimney necessary to secure the same rate of combustion would have to be approximately 385 ft.

Even with such a chimney, however, the same steaming capacity could not be attained, on account of the lower heating value of the fine coal—a more rapid rate of combustion would be necessary. The average relative heating values of pea and buckwheat No. 3 vary about as 1.5 : 1, so that the rate of combustion, in order to secure the same steaming capacity for the plant operating on the lower grade of fuel, would have to be increased to about 37½ lb. of buckwheat No. 3 per sq.ft. of grate per hour. Besides requiring a larger stack (greater in cross-sectional area) to accommodate the greater volume of exhaust gases, the chimney would have to be of entirely impractical height, unless mechanical draft equipment was installed—the necessary height being probably close to 1000 ft.

Though changing the plant fuel from pea to buckwheat No. 3, when the necessary maximum rate of combustion of the larger coal is 25 lb. per sq.ft. of grate per hour, would be quite out of the question, unless mechanical draft was resorted to, it might be possible to use buckwheat No. 1 to advantage. To secure the necessary draft for maintaining the rate of combustion with the lower-grade fuel, the chimney would have to be increased in height to about 245 ft. To secure the same steaming capacity, the rate of maximum consumption would have to be increased to 25½ lb. per sq.ft. of grate per hour, the relative heating values of pea and buckwheat No. 1 being about as 1.02 : 1, which would necessitate a chimney about 255 ft. high.

Disregarding the fact that in order to secure similar chimney efficiency the cross-sectional area of the stack should be somewhat increased, changing the plant fuel to buckwheat No. 1 would necessitate a chimney nearly 50 per cent. taller than the efficient height of chimney when burning pea. The cost of building a chimney 50 per cent. higher than another is more than 50 per cent. greater, both on account of the greater difficulties of construction and the fact that the foundation required for the taller chimney would be considerably more expensive than that necessary for the shorter stack. The difference in initial cost would be about 70 per cent. Remodeling a chimney would entail even greater expenditure, so that a conservative estimate of the cost of remodeling a chimney so as to increase its height 50 per cent. would be about equal to the cost of the original chimney.

A Larger Stack Is Necessary for the Smaller Sizes

The foregoing does not take into account the increase in cross-sectional area of stack required to accommodate the greater volume of exhaust gases. The cross-sectional area of the stack is of even greater importance to efficient boiler operation than is the stack height.

A stack that is too low for natural draft operation can still be used if its draft is supplemented by that from some mechanical-draft equipment. A chimney of some kind is always required to carry the products of combustion to a sufficient height to allow their proper diffusion with the atmosphere.

The size of chimney, likewise, must meet certain requirements. It must always be ample to receive the output of the breeching without creating undue resistance by throttling or the formation of dead spaces in the boiler due to the difficulty of the gases passing into the breeching. This accommodation must be capable of caring for all the exhaust gases at the maximum rate of combustion. This is true regardless of whether natural or mechanical draft is employed and is about the only condition that permits of no variation.

Of course the grade of fuel consumed affects the question, for the size of chimney is not dependent upon the heating value, but upon the total weight of fuel consumed in a given time and the quantity of air that must be admitted for its proper combustion. Leakage through the boiler setting, etc., has also to be counted on, and as more air is required for hand firing than when employing automatic stokers, it is usually advisable to proportion the stack capacity to care for the maximum possible demands.

The shape of the stack's cross-section and the nature of its internal surface modify the carrying capacity of a chimney, but as stacks are almost invariably either round or square, of steel or masonry construction, definite sizes for any rate of combustion can readily be calculated for "standard" chimneys. A circular steel stack permits the smallest cross-sectional area; a circular masonry chimney or a masonry-lined chimney requires a cross-sectional area about 5 per cent. larger, as does also a square unlined steel chimney; while a square masonry chimney or a square steel chimney lined with brick requires still an additional 5 per cent. in cross-sectional area in order to handle the same amount of exhaust gases.

The relationship between the size of chimney, of various shapes and constructions, and the maximum total coal consumption, based on hand-firing operation, either in pounds or tons per hour, is graphically depicted in Chart 2. With the assistance of this chart, almost any standard type of chimney can easily be properly proportioned, so far as its size is concerned. It provides also a valuable and accurate means of ascertaining whether an existing chimney would permit a change in the grade of fuel employed at the station.

Little Difference in Size of Stack When Using Pea or Buckwheat No. 1

Considering a plant burning pea, the maximum rate of consumption being as before 25 lb. per sq.ft. of grate per hour, with a total grate area of 260 sq.ft., the maximum coal consumption per hour would be 5750 lb., or 2⅞ tons. This, if the chimney had a circular masonry or masonry-lined stack, would require a chimney (stack) diameter of 6 ft. 9 in. Employing buckwheat No. 1 to secure the same steaming capacity would necessitate an increase of about 1½ in. in stack diameter. A chimney 6 ft. 10½ in. in diameter would cost about 2 per cent. more to build than one 6 ft. 9 in. in diameter, the cost for a given height of chimney being about proportional to the quantity of coal consumed at the maximum rate of combustion.

Though such comparatively slight advisable increase in diameter of stack might be overlooked, without much danger of ever overloading the chimney, if the change was from pea to buckwheat No. 1, an increase in diameter would be highly necessary if it were decided to install mechanical draft and use buckwheat No. 3. In such an event, the fuel that would have to be consumed in order to realize the same steaming capacity would be about 50 per cent. more by weight than when burning pea, so that the maximum coal consumption would be 8625 lb. per hr. instead of 5750 lb. This would necessitate a stack nearly 8 ft. in diameter, and the cost of a brick chimney so proportioned would be, for a given height, about 20 per cent. more than that of an equivalent and similar chimney for the use of pea.

The examples cited show directly, not only the heavy expenditures required to make alterations in existing chimneys, but also indirectly the great wastes that are represented by the use of chimneys of greater capacity than that actually required. The converse deductions are every bit as important as those that are brought out directly.

Though the charts presented and the general discussion have aimed to point out facts by which more efficient chimneys can be designed than those so frequently encountered, they serve equally well as guides by which existing chimneys can be modified so as to secure greater economy in the cost of steam generation. For instance, Chart 1 indicates at a glance when it would pay to install fuel economizers in a plant operating on natural draft. If the existing chimney is 37½ per cent. higher than necessary to produce the requisite draft for the most rapid rate of combustion—a state of affairs that is not at all uncommon—economizers could be profitably installed.

As any type of draft equipment is but a substitute for an additional height of chimney, this chart likewise provides a reliable measure of the draft-equipment capacity required for the fuel economizer, so that the exact monetary value of such heat-reclaiming apparatus can readily be calculated for any type of power plant.

Chart 2 is really the more valuable, however, both when designing new chimneys and for investigations of the possibilities of increased plant efficiency from higher rates of combustion, changes in fuel, etc. It is more important to have room for the accommodation of the products of combustion than it is to have a chimney of sufficient height to draw them from the combustion chamber, etc., and discharge them to the atmosphere without assistance of mechanical-draft equipment.

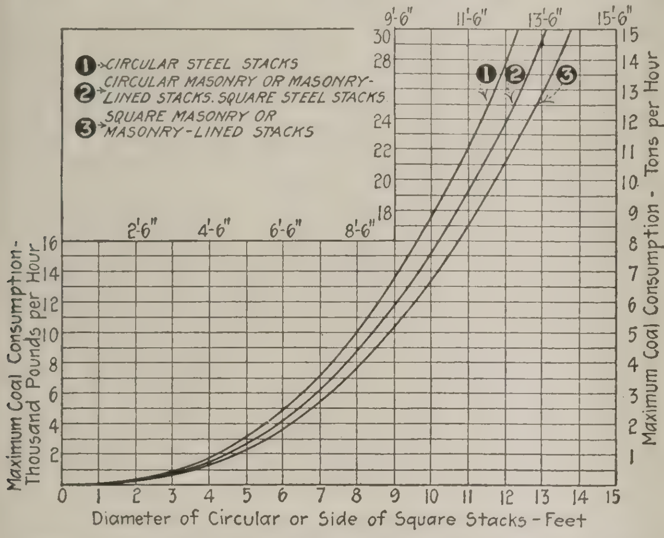

CHART 2. RELATION BETWEEN SHAPE, CONSTRUCTION AND MAXIMUM CONSUMPTION

It is well, therefore, to lay out a new chimney so as to be able to accommodate all the exhaust gases when using the lowest grade coal that the plant is ever liable to employ and at the maximum rate of combustion for that particular coal, not the maximum rate of combustion for the grade of coal for which the plant was planned. With the continually increasing price of coal, particularly anthracite, it is always possible that a plant may eventually realize economies by adopting a lower grade coal for its fuel than that most economical at the time the plant was erected. When such an occasion arises, the ability of the chimney to accommodate the gases from the lower grade fuel often governs the wisdom of the change.

It is more desirable to make the chimney big enough than it is to build it high enough. Most mistakes in chimney construction are made in building too high. The money wasted in such a way could be put to much better use in making the chimneys larger, for then a poorer grade coal could be used, should the necessity or opportunity therefor arise.

Electrical vs. Steam Winding

A few years ago the suggested employment of electric motors in place of steam winding engines would have been scoffed at. Today, as John Gregory recalled in his presidential address before the North Staffordshire Institute of Mining Engineers some months ago, in spite of an enormous increase of depth and load, there are few instances where, in laying out a new colliery, a considerable advantage cannot be obtained by their use.

The length of time occupied in a single wind is so short that the utmost attention must be devoted to the periods of acceleration and retardation, and it is here that the electric motor is particularly advantageous, while its even turning moment contributes to the steady running of the winding rope.

Generally speaking, however, it is only in new collieries that electrification is possible, and as yet the steam winding engine continues to be the principal means of raising coal to the surface in Britain. Mr. Gregory admits that the steam engine is well suited for such work, but the steam consumption is inevitably high, and in spite of the application of various forms of automatic cutoff, it was not until the development of the exhaust steam turbine that a serious waste could be checked.

Since their first application some 8 or 10 years ago, the use of exhaust steam, and more lately mixed pressure turbines, has rapidly extended, and today there are few collieries of any size in England where a plant of this description is not installed, either for the generation of electricity or the compressing of air for supplying auxiliary power.

Wellington Coals in the San Francisco Market

The coal coming from British Columbia is mostly the Nanaimo product mined by the Western Fuel Co. Some Comox coal is also brought down for bunkering purposes. There is little Ladysmith or Boat Harbor coal coming into this market.

The coal mined by the Western Fuel Co. is sold here as New Wellington or short Wellington coal. It took the name and reputation of the Wellington coal mined and introduced into San Francisco by Alek Dunsmuir, who had bunkers and yard at that city. In 1905 the agency for Comox and Ladysmith coal was taken over by the Western Fuel Co., as well as the bunkers and yard referred to, situated at Folsom St. The old Wellington coal originally brought into this market was well liked, and it established the reputation of Vancouver Island coal in general. It had only a feeble competition to contend with at that time, and coal users were not so particular in regard to fuel as they are now. The Wellington has lost much of its old-time glamor. It has been off the market for a considerable time owing to the strike on Vancouver Island. And also Wellington coal coming from Nanaimo is not up to the old standard of the original Wellington as it clinkers.

The Wellington coal is sold in the bunkering trade, for which purposes the Western Fuel Co. is also using some of the screenings. There are also a few thousand tons of Comox in stock at Oakland, which is used for bunkering vessels.

The wholesale price for Wellington coal, as sold to retail dealers, is $7.50 per short ton at this writing. Before the strike the regular price of Wellington coal used to be $8. In Oakland a still better price has been made to dealers in the storage season for coals contracted in quantities of more than 25 tons, for which a price of $7 has been asked. Screenings are wholesale to retailers at $5 a ton, but are difficult to sell and do not bring more than $3.50 to $4.50 in scow-load and carload lots.

Coal Mine Accounting System

By J. C. McNeil*

SYNOPSIS—The financial failure of many coal-mining companies can be traced to a faulty system of accounting. A mine like a bank should so keep its accounts that there will be no loss of capital.

The purpose of any accounting system is not to merely record the debits, or charges, and the credits, or payments and allowances made. Any accounting system which does not thoroughly analyze the transactions and give a complete history of the business is worse than useless.

With manufacturing, mercantile or any kindred business a portion of every dollar taken in revenue goes to increase the assets and to make the business more valuable. It is not so with mining. Every ton of coal taken from a mine decreases the value of the property to that extent. It is highly essential, therefore, that the cost of doing business be known accurately.

I know of a number of men who opened coal mines in the days when anything that was black sold for coal. They enjoyed a reasonable market for the output at a fair selling price. The miners were paid good living wages and there was little dead expense. At the end of every year the books were balanced, and when the bank balance showed up nicely and all the current bills were paid, the remainder was divided among the stockholders.

The years passed, and before they were scarcely aware of it, the mine had been worked out. Some of the stockholders suggested moving to other fields; but then that meant the organization of a new company, and refinancing. All of the stockholders in the old company were not able to go into the new one and enter the other field. The company itself could not make the change, as it had no assets. In the 20-odd years the company had been in business good dividends were paid the stockholders and they consoled themselves with this fact.

Suppose, for example, that they had put their money into bank stock, and at the end of 20 years the bank directors had come to them and said: "Let us have some more money. We have been in business for 20 years and have used up the capital." That would forthwith have called for an investigation; but they would never have gone that long in the banking business using up the capital. A proper accounting system would have prevented it.

In talking with another operator about his cost of doing business, I asked him for details as to his cost of production. The figures were given and they seemed fair enough. However, the item of royalty was missing. "How about royalty?" was put to the operator. Oh, he didn't charge any royalty; he owned the land himself! There is another case of not providing for the future.

It is as essential in getting into coal mining to provide an adequate accounting system as it is to get sufficient capital to enter the business. Some concerns sell their coal at about what it costs them to produce it, and sometimes below the cost of production (because an inadequate accounting system doesn't give the facts), and they depend on their merchandise profits and tenement rentals to pay their dividends. This is a mighty big investment for a mercantile business.

The revenues of a coal-mining company are derived from the sale of coal, from the sale of merchandise to employees, the rental of tenements to employees and from other sources. The principal expenses of a coal mining company are for production of output, maintenance of plants, maintenance of mines, distribution of output (sales) and general (miscellaneous) expenses.

In order that the revenues of the coal mining company may be accurately accounted for, an invoice should be prepared for every sale of coal made, whether the shipment is of one ton or several thousand tons, and the invoices must of course be properly recorded in a sales, or shipping, register. In order that a ledger account may be carried with every party to whom the coal is sold, a sales ledger should be maintained and a controlling account carried in the general ledger with this sales ledger. Thus all of the coal sales will be carried in the general ledger under one account.

From time to time sales of materials that are not purchased to be resold are made merely as accommodations to the purchasers. These are not revenue sales, but are primarily credits to expenses, and in order that proper sales may not be distorted, these invoices should not be carried in the sales account, but in a collection bills account. If the number of sales and bills are sufficient to so warrant, a separate ledger would be necessary.

All expenses should be handled on properly supported vouchers. In fact, all payments should be made by check or voucher, and the only cash that would be disbursed by the treasurer would be in the shape of payments to the bank for deposit on account. True, the payrolls cannot be satisfactorily paid by all companies in the form of a check and will have to be made in cash, but a voucher for the full amount should be drawn.

Other expenditures are made by mines in the way of improvements, additions to existing properties, putting in power plants, etc. These should not go into the expenses. They are sometimes paid for out of the surplus earnings, sometimes by the sale of additional capital, either in the shape of stocks or bonds. For these "capital" accounts, a general ledger account should be set up known as "additions and betterments."

It is a known fact that power plants will not last forever and that every ton of coal removed from the property decreases its value to that extent. These contingencies should be met by reserve funds which are set up as liability accounts and the offsetting charges made to the expense accounts. Some concerns reduce the investment accounts—lands, plants, etc.—by the amount of the charges to their expense accounts and reduce their assets in this manner.

By this method it is their intention to bring the property accounts down to zero by the end of the estimated period when the mine will be worked out. However, the writer's opinion is that the reserve accounts should be set up and the money actually taken out of the business and invested in securities of some kind. This, we believe, would be dealing more honestly with ourselves and would enable us to arrive more definitely at the real cost of production.

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*Artemus, Ky.

Railroads in their accounts work them out in such a manner as to find what it costs them to move a ton of freight one mile and what revenue they derive therefrom. So should it be with coal companies. The accounts should be kept accurately and the statistics worked out monthly so that it can be readily ascertained what each operation has cost per ton of coal mined. When these statistics are worked out, the operator can tell at a glance whether his price should be $1 or $1.25. If his average selling price is $1 and his costs according to the statistics are $1.07, after taking out his royalty, depreciation of plant, interest on investment, etc., it wouldn't take a seer to tell him to get into another line of business.

When an accounting system of this kind is adopted and the expenses are in plain figures, low prices and selling coal below cost of production to "keep the organization together" will fall by the wayside.

⁂

Automatic Sampling of Coal

A great deal has been written and many discussions have taken place regarding the proper methods to employ to correctly sample coal, says L. C. Bosler in *Power* for Nov. 3, 1914. It seems strange to the writer that some of the larger consumers of coal should continue to use the ancient and crude system of sampling coal by taking a handful or shovelful from each car or bucket unloaded, as the case may be. For a proper analysis of a quantity of coal the first and important thing to get is a representative sample, after which this can be reduced to a working quantity by an automatic machine.

The Philadelphia Rapid Transit Co. has perfected and put in its Beach power station an automatic coal-sampling device by which all of the coal received is sampled without the human element entering into the operation at all.

Coal is received in boats and is unloaded therefrom by two electrically driven locomotive cranes on the pier. The coal is dumped into cars where it is weighed and is then delivered to a conveyor and carried to the crusher. The coal at this point is reduced to a size not greater than 3 in. in diameter. It is then raised to a height equal to the elevation of the top of the coal bunkers and is then conveyed to them. The sampling device is in this last named conveyor.

Referring to Fig. 2, the hopper for catching the major sample is underneath. Beneath this is a No. 00 rotary crusher and automatic sampler, made by the Sturtevant Mill Co., which receives the coal from the hopper. This machine performs two separate and distinct functions; it first grinds the major sample to any desired size and then divides it into two parts, one of which is the final sample, it being drawn from the front spout, while the balance falls back into the bunker through the side spout. By operating the adjusting wheel on the grinder, any proportion desired can be obtained between the final and the major sample.

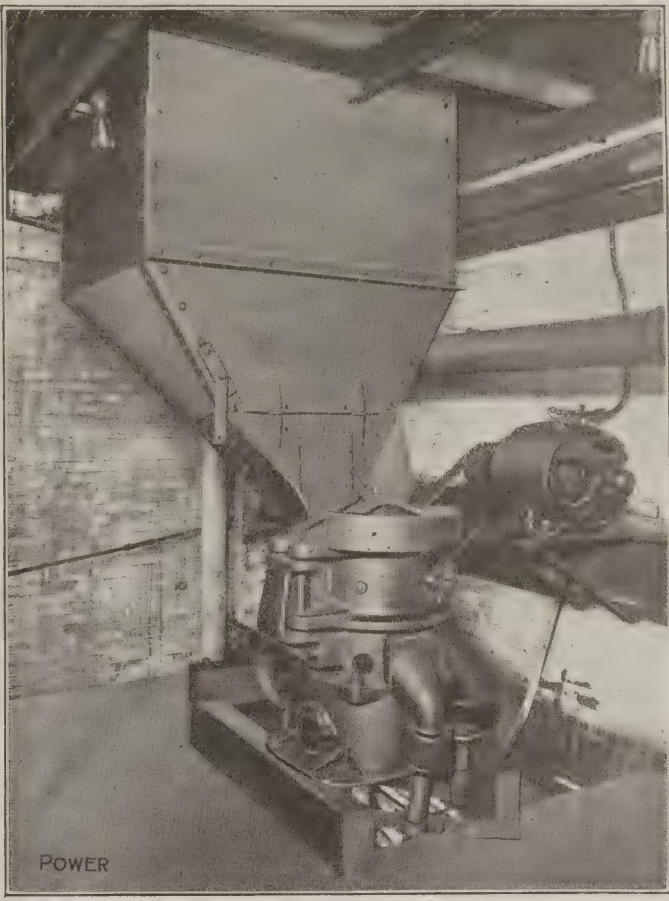


FIG. 1. AUTOMATIC COAL SAMPLER UNDER COAL CONVEYOR

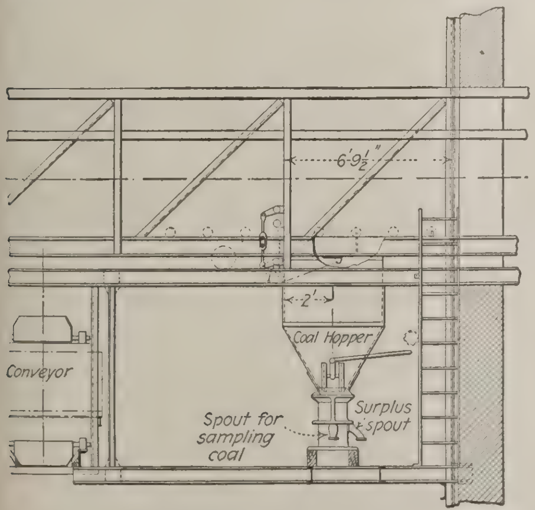


FIG. 2. CONVEYING AND SAMPLING MACHINE

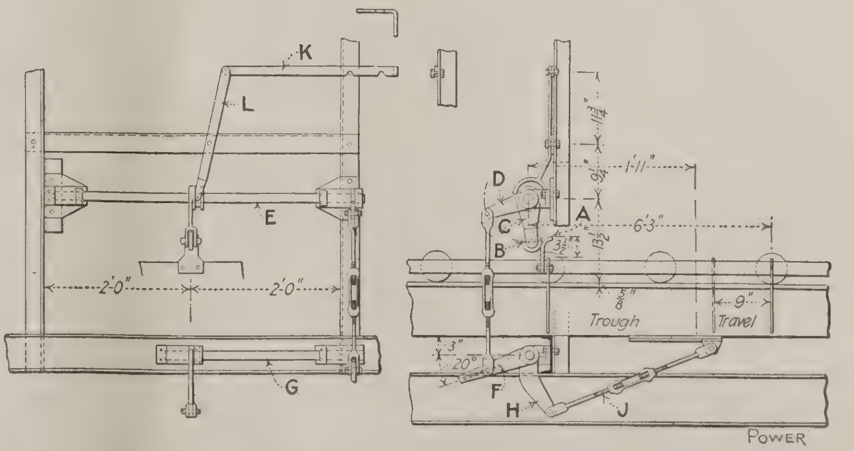


FIG. 3. GATE-OPERATING MECHANISM

Fig. 3 is a view of the gate-operating mechanism. On a flight of the conveyor is fastened a plate *A*. With the movement of the conveyor to the left this plate engages with the roller *B* and thereby raises the arm *C*. With this movement the arm *D* is also raised as both are keyed to the shaft *E*. As the arm *D* raises it pulls up the arm *F*, which, through the shaft *G*, is keyed to the arm *H*. At the end of this arm is fastened the rod *J*, which operates the gate. This gate is closed by the use of a counter-weight attached to the arm *F*. By the pull rod *K*, and yoke lever *L*, the arm *C* can be slid on the shaft *E* out of the path of the plate *A*, thereby cutting the apparatus out of service.

It will be seen that there must be a fixed relation between the position of the flight and the opening of the gate. With the gate wide open when the flight reaches the near side of the hole, the maximum discharge will take place as the coal is always banked against the flight.

The amount of coal desired in the major sample is governed by the number of openings of the gate per revolution of the conveyor and this in turn by the number of arms *A* that are fastened to the flights.

As an example, from each boat load, averaging 800 tons, a major sample of about 1500 lb. is taken. After passing the grinder and sampling machine the final sample is 6 lb.

In Fig. 1 the actual apparatus is shown under the coal conveyor in the boiler room. The two spouts referred to in the foregoing are seen near the bottom of the grinder.

During the recent special tests made by the company on six samples of 1000 tons each, three major samples of 1500 lb. were desired from each cargo. To accomplish this, it was necessary to have four gate openings per revolution of the conveyor, this delivering the required amount. The opening in the bottom of the conveyor trough through which the coal passes to the hopper is 4x6 in. and by actual experiment was found to deliver 3 lb. of coal per opening under ordinary conditions of moisture.

All of the apparatus except the crusher was designed and erected by the company's engineers and has been in continuous service for a year giving excellent results.

Supt. Jones on the New York Coal Specifications

The first test of the new tentative specifications for the purchase of coal for city departments, printed in *Coal Age* of July 24, took place when Patrick Jones, superintendent of supplies of the New York City Board of Education, opened nine bids for furnishing and delivering 23,700 gross tons of No. 3 buckwheat and mine-run coals. Previous to the opening of the bids Mr. Jones had received letters from two coal dealers protesting against the provisions of the specifications, in one instance the writer saying he would not submit a bid.

Mr. Jones refused to make public the names of the dealers, saying he had not yet made his report to the Board of Education, but he did make public his replies to the dealers in which is set forth his opinion of the specifications. In one letter Mr. Jones says:

"I wish to state that before the specifications were approved, the Bureau of Supplies was perfectly satisfied that said specifications would be in keeping with the market conditions. Our experience regarding the ash and B.t.u. for No. 3 buckwheat coal has been that it is always available. Besides, we cannot afford to get coal of an inferior grade, lest the idea which we have in mind be nullified.

"The specifications which we used last year for No. 3 buckwheat coal were practically the same as the present ones. You may recall my visit to your office last year in regard to the regular coal contract. At that time you raised the question of the unfairness of penalties when the contractor frequently delivers coal the quality of which is in excess of our specified requirements. The remission clause in the new specifications has been designed to overcome this difficulty and make the specifications more equitable to the contractor."

The second letter states:

"I was under the impression that the specifications for the present year were more favorable than those we have used in the past. We used practically the same specifications for the year 1914 and had no difficulty in getting bids, and we got the coal as well.

"However, since that time my representative has been coöperating with the Bureau of Standards with a view to making the specifications more equitable. The remission clause, in my judgment, is a very good thing, and many of the large coal dealers have so expressed themselves."

Canada's Coal Production

Sales, shipments, colliery and other mine-consumption and coking production of coal in Canada for 1914, says *Commerce Reports*, amounted to 13,594,984 short tons, valued at $33,433,108, compared with 15,012,178 tons, valued at $37,334,940 in 1913, a decrease of 1,417,194 tons, or 9.4 per cent., in quantity and of $3,901,832, or 10.4 per cent., in value.

Arbitrary values are assigned to coals of Nova Scotia and of British Columbia. These are rated as $2.50 per long ton for Nova Scotia and $3.50 per long ton for British Columbia. In the other provinces prices are those returned by the operators. Distribution of production is as follows:

Locations of Mines	Tons	Decrease	Value
Nova Scotia	7,338,790	641,283	$16,381,228
Alberta	3,667,816	346,939	9,367,602
British Columbia	2,238,339	476,081	6,994,810
Saskatchewan	232,541	19,644*	375,438
New Brunswick	104,055	33,744*	260,270
Yukon	13,443	6,279	53,760

*Increase.

Exports of coal in 1914 amounted to 1,423,126 tons, of a value of $3,880,175, compared with 1,562,020 tons, of a value of $3,961,351 in 1913, a falling off of 138,894 tons, or 8.89 per cent.

Imports during the year included bituminous, lump and run-of-mine, 7,776,415 tons, valued at $14,954,321, an average of $1.92 a ton; bituminous slack, 2,509,632 tons, valued at $3,605,253, an average of $1.43 per ton, and anthracites, 4,435,010 tons, valued at $21,241,924, an average of $4.79 per ton. This gives a total of 14,721,057 tons, valued at $39,801,498. Figures for these classes in 1913 were: Bituminous, etc., 10,743,473 tons, $21,756,658; bituminous slack, 2,816,423 tons, $4,157,622; anthracite, 4,642,057 tons, $22,034,839; total, 18,201,953 tons, $47,949,119. Of the 1914 consumption 45.4 per cent. was from Canadian mines.

The Labor Situation

SYNOPSIS—There are expectations that the Hocking Valley operators will secure a new and lower wage scale. Tom Lewis becomes a secretary for coal operators in West Virginia. Colorado mine workers accuse the governor, attorney-general, national guard and three company presidents of murder. In return those charged suspect that the union officials are guilty of subornation of perjury.

The executive committee of the Ohio branch of the Mine Workers of America held an important session at Columbus last week to discuss plans for securing work for miners in the Hocking Valley district. The demand of the Sunday Creek Co. that equal concessions in the dead-work scale should be given the operators in the Hocking Valley as were conceded in eastern Ohio was not discussed and the officials of the Ohio organization emphatically denied that any change would be made in the working conditions. It is claimed by John H. Winder, general manager of the Sunday Creek Co., that the concessions granted operators in eastern Ohio really mean a reduction of 5 to 15c. per ton on the cost of producing coal.

It was reported in mining circles last week that the miners were thinking of calling on their officials to grant concessions which would permit of the Hocking Valley mines being placed in operation. The business men and shopkeepers of mining towns are said to have been urging this move.

Destitution in Mining Regions of Ohio

In the meantime relief work progresses among the destitute miners and their families in the Hocking Valley. This relief is distributed through the office of the adjutant-general of Ohio. J. W. Wheatley and George A. Shust, miners of the Hocking Valley district, are touring the state and soliciting subscriptions for the relief of destitute families in the coal fields. They have secured substantial contributions of money, clothing and food in the cities visited. Both men have worked in the Hocking Valley district for more than 25 years, tilling small farms when the mines were idle.

The "Five-A Studios," a local moving-picture concern, has just finished the production of a drama called "Silent Valley," based on the troubles in the Hocking Valley field, and partly staged in the mining district with the aid of the miners and their families. The production has the approval of state authorities, and will be shown throughout Ohio to secure funds for the benefit of those in distress in the district.

Freight Rates and Wages in Hocking Valley

The books and records of the Hocking Valley Ry. are being examined by experts under the direction of the Ohio Utilities Commission. The railway company has as yet made no move to secure an injunction to prevent the examination of the books, and it is likely that none will be filed at this late date. The experts say that the data will be in shape for presentation to the commission when the hearing on the rate question is resumed, Oct. 5.

On a recent visit of John H. Wilder to Assistant Adjutant-General E. S. Bryant the former stated that not until there has been an adjustment of mining conditions will the Sunday Creek Co. be able to open its mines. The governor's office has been petitioned to act to assure the reopening of the mines in the Hocking district. The claim was made that the recent 15-per cent. reduction in freight rates by the Hocking Valley Ry. would enable the mines to reopen. It appears, however, that only 5 per cent. of the tonnage of the Sunday Creek Co. is shipped over the Hocking Valley Ry., while the remainder is transported by the Toledo & Ohio Central, which has yet made no move toward reducing its freight rates.

Tom Lewis Becomes Secretary for Operators

Through the influence of Quinn Morton, president of the Imperial Coal Sales Co., and Edward Schoenebaum, of the Marmet-Halm Coal Co., members of the executive committee of the recently organized High Volatile Coal Operators' Association of West Virginia, Thomas L. Lewis, of Bridgeport, Ohio, has been made executive secretary of the association.

This selection caused much surprise, for Lewis was at one time president of the United Mine Workers of America. However, there is general confidence in his ability and honesty, and the operators are well satisfied with his selection. The name of the association has been changed to the Splint and Gas Coal Operators' Association of West Virginia.

It appears that for several months the officers of the labor organization have maintained in Colorado a staff of nearly 40 private detectives who have endeavored to obtain evidence against the mine operators. As a result of their work it is said that charges of murder will be made against the governor and attorney-general of the state, the officers of the state national guard and Presidents Jesse E. Welborn, of the Colorado Fuel & Iron Co.; David W. Brown, of the Rocky Mountain Fuel Co., and John C. Osgood, of the Victor-American Fuel Co.

Union Detective Asked to Perjure Himself

On Aug. 28 the governor appointed a military court of inquiry, which was conducted by Colonel Boughton according to regular army rules. It secured sworn testimony from various persons involved in the accusations of the union leaders. It appeared that former Adjutant-General C. D. Elliott, of West Virginia, a union detective, had been instructed that it would not be necessary for him to substantiate charges he might bring against the operators or state officials, as he was expected to use such accusations only in attempts to induce the dropping of prosecutions now pending against mine workers and union leaders.

Written evidence in the form of letters that passed between these detectives and their employers was introduced to show that these agitators were responsible for the demoralization of the state militia. The coal-company presidents accused state that they are prepared to refute all charges and to prove that their persecutors are conducting this attack purely in retaliation for the conviction of John R. Lawson and the indictment of numerous other labor leaders in Colorado.

Michigan Increases Production

Michigan is not a big coal-producing state, yet the U. S. Geological Survey reports that unlike most coal producers it increased its output in 1914 over that of the previous year, the production being 1,283,030 short tons, valued at $2,559,786, an increase over 1913 of 51,344 tons in quantity and $104,559 in value.

Michigan's coal production has exceeded 2,000,000 tons in one year only, 1907; since then it decreased steadily until 1912, when it reached the minimum for the decade. The decrease is attributed to the competition of higher-grade coals from West Virginia and to the small demand for lump coal in the manufacturing plants of the state.

The mines were free from labor troubles, and no time was lost because of strikes. The coal-mining fatalities, as reported by the Bureau of Mines, consisted of one death from fall of roof and one from an accident in connection with mining machinery, a total of two, as compared with three in 1913 and eight in 1912.

Lamp Declared Permissible

On Aug. 21, 1915, the Bureau of Mines approved as permissible for use in gaseous mines the steel, flame safety lamp known as Koehler Model No. 1, manufactured by the Koehler Manufacturing Co., Marlboro, Mass. Approval No. 201 has been issued to the Mine Safety Appliances Co., 541 Fourth Ave., Pittsburgh, Penn., general agent for the lamp.

At present this approval extends to this type of lamp only when equipped with a flat wick and permanent horseshoe-magnet lock. The only globes so far approved for use with these lamps are those identified by the symbol "Macbeth High-Speed No. 210," manufactured by the Macbeth-Evans Glass Co., Pittsburgh, Penn. The only igniter so far approved for use with these lamps is the Koehler Model 1915 Pyro Igniter, manufactured by the Koehler Manufacturing Co., Marlboro, Mass. This lamp is the first to be approved by the Bureau of Mines according to the provisions of Schedule 7.

Editorials

Has Union Activity Helped Labor as a Whole?

A separate report was made to the Commission on Industrial Relations by the three labor leaders in that body, defending the purpose of unions and lauding their work. They evidently recognized that there were still many people who questioned the value of labor organizations to working men, and it must be admitted that there are reasons for the uncertainty which still prevails as to the value of solidarity as a means of raising the welfare of workingmen as a whole.

We are told that unionism has raised wages, but it is a fact that in the memory of men still living ablebodied men worked for 50c. a day at employment which was then, and is still, ununionized. The same work now pays $1.50 to $2 per day. Many men in 1890 worked for 10 hours and received only a dollar. Their services could not be secured for that today; yet these same men are still without a union. It is hard to show that any combination was the cause of the 200 or 300 per cent. increase in wage which has taken place since the middle of the last century.

Of course, it will be said that these men partook in the general rise secured by unionism. It is as useless perhaps to deny it as to attempt to prove it. The influence of example in the rise of nominal wages is so intangible that it is hard to evaluate.

But such gains as have just been discussed are really largely nominal, not actual, for the only real gain of the workers, outside of that arising from efficiency, is obtained by reducing the profit of the employers. If every dollar every employer received were handed on to his workers the wage would be the highest possible. Any higher wage would be merely reflected in higher cost of living and would be merely a nominal, not an actual, increase.

Consequently the proportion of the selling price which the worker receives is the norm on which his wage should be determined. It is absurd to figure it in money values except for purposes of comparison between workers. It is its fluctuation with the selling price of products which is important.

In general it is doubtful whether in recent years this ratio has increased much in many trades. Even the unions do not assert that it has. In some industries, it is true, it has reached a maximum. In the coal trade it has almost always been high except in newly opened coal fields or for brief periods of time. And in this case the union actually admits that the ratio is too high in some states—that is, the price of coal is so low that the operators cannot continue in business and pay their men the wages which the union believes they should be paid and which are provided in covenants with the union.

But as the receipts of the employer in excess of what he pays the worker should be almost wholly and are mainly expended as the capital by which business is made efficient, and without which the business of the company would come to an end, it is questionable whether the union helps the working man when it reduces the employer's profits, for it reduces his opportunity to be efficient. Some mines have suffered so much from enforced economies that they are now no longer economically run, and the miner may get all or nearly all the gross income and yet would be better paid if with better equipment he received a somewhat smaller percentage of the gross value of the output.

It is by no means certainly proven that the greater prosperity working men now enjoy is due to union activity. It is more probable that it arises from increased intelligence of employer and employee and from improved machinery. The union has concentrated its efforts on distribution. Someday we may realize that there cannot be a 100-per cent. division for the worker. We may learn that some part of the product must be kept back either as savings by the workman or as profits by the employer, whether that employer be an individual or the state.

But be that as it may, steadiness of work is an essential of prosperity, and it is not certain that the union has made the conduct of industry more regular. In fact, there are many who think that the union by its strikes, by its creation of inequalities of wage, whereby the industry in whole states is made impossible, and by the unrest it has occasioned, has caused much of the present idleness and dislocation of business from which the country suffers. Possibly this is partly true, though restrictive legislation alternated with unequally and unduly helpful enactments, such as tariffs, both fitfully applied, are at least as much to blame as union activity.

The unrest is not wholly in labor. Business is also in a turmoil and the unrest of one has completed the unsettlement of the other, for men in idle industries become impoverished and consequently discontented, and conversely companies with men on strike cannot pay the bills they have incurred or interest on their bonds and they become bankrupt. Thus the turmoil of business causes industrial unrest and the active protests of the men ruin what business is being conducted.

Some unions have succeeded in securing wages for their members above the average, in other trades or in the same trade in other fields, and this is the stock argument of the advocate of unionism. He points out that only the continuance of the union assures the payment of such larger wages despite the protests of the jobbers and the manufacturers. But it must be remembered that these wages are maintained at the cost of the consumer and therefore are burdens on other workers.

By the use of certain muscles a man can raise his arm. Strive as he will he cannot lift his whole body by hauling on his shoulder straps. Unions like muscles can lift a part of labor by agitation, but they cannot raise the whole body of labor by such methods. Raising the wage of the miner, for instance, inevitably increases the cost of living to all who have to buy a bucket of coal.

A well-organized industry with international power, manufacturing any commodity, could fix wages at any high level and make other men pay them if they could restrain strikebreakers. Some industry may yet succeed in raising wages to an unheard-of level, and with the trusts they may succeed in convincing the world that both unions and trusts must be controlled. Such control may seem so socialistic that the whole body of socialism will be accepted as the most satisfactory outcome.

The strike of the miners in Great Britain may have such an effect, even though not international. The British people will pay anything for coal which operators may demand. The operators can then pay any price to the miners. What remains if both or either are unreasonable? Legislative restriction. The miners resent this, though the operators have already consented to it. If the miners persist probably socialism will be inevitable. But there is nothing to show that the miners will be benefited by the change.

On the New York Post Office runs the proud motto, "Neither snow, nor rain, nor heat, nor gloom of night"—no, nor even children slain by motor cars on the streets—"stays these couriers from the swift completion of their appointed rounds."

Let the miners read it and remember that it is no idle boast, for the rules which back it are most stringent. A private concern could not brag so openly of the extremities through which, under bond, it forces its employees to comply with its contract.

* * *

Significance of Labor Day

Labor Day is the heaven-sent opportunity for the district attorney and candidates for office to make speeches about the dignity of labor in which they only half believe. They try to edge themselves in as laborers by referring to the fact that there is both body and brain toil. Their platitudinous utterances are little heeded and soon forgotten. The district attorney goes home, does as little muscle work as he can avoid and firmly decides that his children shall not do more.

In fact, he talks somewhat disconsolately and socialistically, bewailing that the trusts have cornered all opportunities and gives his children no chance. He knows that they have an opportunity to work at that muscle labor which he has just been praising, and which in his heart he condemns, but he has decided that for them a certain lucrative brain labor should be provided; and as he is doubtful of their ability he begins to rail that "every door is barr'd with gold and opens but to golden keys."

There is a great race, every member of which is a brain worker. It has produced and is producing despite handicaps many distinguished men. Yet it has not for ages been a nation. For the most part the people of the race do not want an independent national existence, for they know they lack muscle workers. Where the race has had a chance to get to the soil, it has failed. The muscle workers were lacking, and being for the most part shrewd, the people of the race have recognized the difficulty and respected their limitations. Most of them are opposed now definitely to any attempt at national existence which would to all appearances be futile and might be ridiculous.

The importance of the muscle worker is thus made apparent. Those who regret bitterly that the brain workers—"the better class," as they term it—do not multiply and replenish the earth might take this example to heart. Abraham Lincoln said, "God loves the common people or he would not have made so many of them." And perhaps Lincoln, though he did not allege it, realized how fully this thesis could be applied to the increase in the race.

It is perhaps well that it is the muscle workers who are doing the mosaical replenishment and not those brain workers who feel themselves so desirable. We may well rejoice that the former are so common. It would go ill with us if they were not. Are the sons of rich men such desirable people and will there not always be enough abnormal descendants of muscle workers to furnish us with the instructors and leaders of the race?

The muscle workers are for the most part inarticulate or imprecatory. In either case they do not command an audience, but their importance as the backbone of the nation is unquestioned. If their forensic eloquence was as marked as their muscle they would have had us all as much converted to the importance of their services as we are already convinced as to the value of brain work and human leadership.

* * *

Some "Bull" Features in Middle Western Market

Close observers believe that several factors are developing in the Western trade situation which will occasion price advances for free coal before the season progresses much further. One of these is the comparatively large number of mines which have been closed down in Western states during the past dull summer and abandoned permanently. No new operations have been opened to take their place, and the withdrawal of this tonnage from the coal marts must create an additional demand on other producers. The delayed ordering of coal is another factor in the situation; and the late harvesting of grain, which is likely to result in the movement of crops simultaneously with increased shipments of coal, will probably cause a congestion of equipment and car shortage. Finally, there is a lack of men in many mining districts, due to the return of foreign miners to Europe and to a decline in immigration.

* * *

Vich Iss der Cheepest?

The coal industry has its quota of buyers—usually those termed purchasing agents—whose sole standard is price.

How wide they often are of the mark of economic buying, and how far astray this standard sometimes leads, is aptly illustrated in this story.

A Hebrew approached the ticket window of the railway station in one of our large cities and said, "I vant a ticket please to Springfielt."

The agent hesitated a moment and then inquired impatiently. "Well, Springfield what? Springfield, Ohio; Springfield, Massachusetts; Springfield, Illinois; Springfield, Missouri—which Springfield do you want to go to?"

The Hebrew, coming closer to the window and holding his greasy purse a little tighter, replied, "Vich iss der cheepest?"

It may be trite to remark, but nevertheless it is true, that "cheapest in price" does not always mean "most satisfactory in service."

Sociological Department

Field Meet of the Utah Fuel Co.

SYNOPSIS—The meet of the Utah Fuel Co. does not bring together many teams, but it is most conscientiously undertaken, so as to be of the utmost value to the participants and to foster the work among the employees generally.

The annual first-aid and mine-rescue contest of the Utah Fuel Co. was held at Castle Gate, Utah, Aug. 21, 1915. As usual, this field day partook of the nature of an annual picnic or reunion, and social features were combined with the contest. Special trains were run from the Pleasant Valley and Sunnyside districts and brought several hundred people to witness or participate in the events. The uniformed bands from Clear Creek and Sunnyside helped the Castle Gate band to enliven the occasion. As each train arrived it was announced by the explosion of bombs, the visitors being met at the station by the reception committee and the Castle Gate band, which escorted them to the public square in the center of the town where the contests were to be held.

The meet this year was of particular interest and importance to everybody, especially the contestants, for in addition to the usual prizes given each year the company undertook to send the team which made the highest combined score in first-aid and mine-rescue work to the Panama-Pacific International Exposition at San Francisco to compete in the Third Annual Joint Field Meet of the Bureau of Mines and the American Mine Safety Association on Sept. 23 and 24.

WINNERS OF FIRST AND SECOND PRIZES AT MEET OF UTAH FUEL CO.

On the left the cup holders, Sunnyside No. 2 team, and on the right No. 1 team from Winter Quarters

ELIMINATION CONTESTS HELD AT EACH MINE

In order to aid in the selection of the best team, elimination contests were held at all Utah Fuel Co. camps on July 24, in which one team was selected to represent each mine in the main contest held at Castle Gate Aug. 21. In this way six teams were chosen which were supposed to be the pick of the mines, and they were given about a month of special training in preparation for the main event. An outside expert in mine-rescue work was employed for two months in thoroughly drilling the men in helmet work and thus supplementing the valuable instruction of the United States Bureau of Mines, which, on account of exhaustion of appropriations, had to discontinue the rescue-car training in Utah some time ago.

The team from Somerset, Colo., was entertained by the Castle Gate Welfare Association, while the other teams and visitors were provided with accommodations and refreshments by the company. Rest pavilions were erected at convenient places for the benefit of visiting women and children.

In the afternoon a ball game was played by the Sunnyside and Castle Gate teams at Riverside Park, the scene of last year's first-aid contest, and was won by the Castle Gate team by a score of 8 to 6. After the ball game the Castle Gate band gave a concert in the public square, which was largely attended. An enjoyable dance concluded the festivities.

Preparations for the meet were put in the hands of committees selected from the Castle Gate Welfare Association, the success of whose work was well attested by perfect accommodations and the smoothness with which everything was accomplished.

The contests, in both first-aid and mine-rescue work, were conducted strictly under the rules adopted for the joint field meet at San Francisco, and with the exception of the problem in rescue work, all the problems were selected from practice problems suggested by the Bureau of Mines and the American Mine Safety Association.

ELABORATE PROVISIONS FOR RESCUE EVENT

The grounds were laid off close to the Knights of Pythias Hall, in the basement of which was built an imitation of a mine for the mine-rescue contests. A plan of the workings is shown. The problem illustrated proved to be one of great difficulty. The teams had to go down the 30-per cent. incline to the entrance, which was a narrow doorway with a brattice hung over the opening to exclude outside light, then along the supposed entry made of posts, boards and brattice cloth about 4 ft. high. Opposite the room neck a small fire was supposed to have started, which had caused quite a fall of rock in the entry outby. The timbers had broken and were hanging, pointed toward the center of the entry from the posts, making an opening about 4 ft. square, through which the rescuers must pass. Trolley wire and power lines were hanging loose, but not touching. Two men who had to be rescued were supposed to have been working in a room which had no crosscuts off the entry inby the fire. These men had found that owing to the poisonous atmosphere they were prevented from making their escape and so had built a barricade in the room neck about 15 ft. from the entry.

So as to give an equal chance to all, all the four contesting teams were given the same rescue problem. This was read to them separately after they had finished the test-of-apparatus drill, and the men were enjoined not to disclose it to the teams following them. Naturally, they did not care to give any undue advantage to their competitors, so they kept the problem secret.

CARE TO AVOID INEQUITABLE JUDGING

The judges for all events were J. C. Roberts, mining engineer, United States Bureau of Mines, Denver, Colo.; J. E. Pettit, state coal-mine inspector for Utah, and H. H. Sanderson, of Salt Lake City, agent for the Draeger Oxygen Apparatus Co. As there were four field events in first aid, the judges could not be assigned to different teams each time, but each judge had to inspect the work of one team for two events. Thus it was that the teams had the same judges in the one-man and full-team contests. In the mine-rescue contest, H. H. Sanderson judged the inspection-of-apparatus work, while the two other judges, Roberts and Pettit, took the work underground. The men's pulses were examined by physicians of neighboring towns.

In the first-aid work six teams competed, one from Somerset in Colorado and the others from Clear Creek, Utah Mine, Winter Quarters, Castle Gate and Sunnyside in Utah, but in the rescue work two of these teams—those from Somerset and Utah Mine—did not compete.

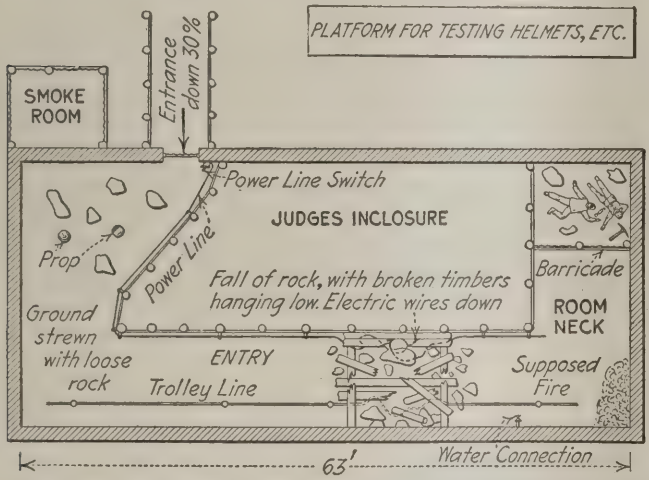
The judges met the evening preceding the meet and decided which problems should be presented. They also discussed the rules by which the events were to be judged. The greatest care was taken to make everything uniform and strictly impartial, and it is believed that absolute satisfaction was given by the decisions. The company feels very grateful to the previously mentioned officials for the services rendered, as their work was hard and unenviable.

PROBLEMS AND THEIR SUCCESSFUL SOLVERS

The problems were as follows:

One Man Event—A man has been overcome by gas in a place so low that he cannot be carried in an upright position. Transport him 20 ft. to a place where the bearer can stand upright and carry him 20 ft. further by the "shoulder carry." Perform artificial respiration by the Schaefer method for one minute. Time, 8 min. Winter Quarters No. 1 and Clear Creek No. 1 tied for first place in this event, both obtaining a perfect score. The second highest score was 96.

Two-Man Event—A man is found lying face up, with his shoulders resting on an electric wire. He is unconscious and his shoulders are burned. Rescue and give him treatment. Time, 8 min. Castle Gate No. 2 and Sunnyside No. 2 both made perfect scores, thus securing first place. Their nearest competitor scored 98.



PLAN OF AN ARTIFICIAL MINE IN WHICH ACTUAL DIFFICULTIES IN MINE RESCUE WERE DUPLICATED

Three-Man Event—A victim has a puncture wound of the palm of the right hand, with bright red blood, a small cut on the calf of the left leg, with slight bleeding, and his left ankle is sprained. Treat the case. Time, 8 min. The best score was made by Utah No. 1 team, which was in no way demerited. The second highest score was 98.

Full-Team Event—The victim has a compound fracture of the left thigh, a wound 3 in. long on the calf of the right leg and a cut on the outer surface of the right forearm, with profuse bleeding. Treat and carry the patient 25 yd. on an improvised stretcher. Winter Quarters No. 1 made a perfect score. None of the other competitors exceeded 97.

The team making the highest average score in all the events was Sunnyside No. 2. It secured a mark of 97.50. The team comprises the following members: M. H. Detweiler, captain; Zeph Thomas, T. J. Johnson, George Clark, J. W Littlejohn and George Usher.

Winter Quarters No. 1 made an average score of 97.25 and secured second place. The team comprises the following members: T. C. Harvey, captain; John Thorpe, James Hall, Horace Simpson, Stanley Harvey and Noah Potter.

Mine-Rescue Event—Smoke is discovered issuing from the mouth of the mine. The crew enters, encounters a bad cave and discovers a fire in the mouth of a room. Men have barricaded themselves against the fire, but have been overcome. Rescue them, working on the fire for one minute. The canary is overcome. Time, 12 min. This event was won by Sunnyside No. 2 Team, with Castle Gate No. 2 a close second.

SUNNYSIDE NO. 2 WINS TRIP TO SAN FRANCISCO

The team making the highest combined score in first-aid and mine-rescue work was Sunnyside No. 2, comprised as above. The average score for all events of the winning team was 91.25.

By winning both events, the Sunnyside team obtained possession of the silver loving cup for one year and a gold medal for each man, all given by the Utah Fuel Co., and in addition will be sent, at the company's expense, to the Panama-Pacific International Exposition in San Francisco, there to compete with teams from all over the country.

A RESCUE CREW BEING INSPECTED BEFORE ENTERING MINE

The members of the Winter Quarters team, for obtaining the second best score in first-aid work, were presented by the company with silver medals.

The work of all the teams was good and there was little to choose between them, there being only 2.5 points of difference between the lowest and highest scores. The scores for all would have been higher but for the fact that not enough time was allowed for the completion of the problem in rescue work. Obviously, it would not have been right to set a new time limit, so all teams were penalized alike.

The work of the first-aid and welfare societies throughout the camps has been of a high-class order, and much good has been accomplished. These societies have been formed by the miners and others residing in the various towns for the purpose of furthering the cause of welfare and first-aid work, and it is due to the voluntary and enthusiastic support of the men that such success has been attained.

For the winning team—Sunnyside No. 2—now commences a period of hard work in preparation for the California trip. It will have the support of the whole company in its efforts to "bring back the bacon" for Utah.

Model Anthracite Village

A model coal-mining village, which includes houses of steel and hollow-tile construction for the mining superintendent, foremen, assistants and miners, has been planned and laid out for the Locust Mountain Coal and Iron Co. The plant will operate the mining property of the Winton-Dodson Co., of which T. M. Dodson is vice-president and general manager.

The success of this model village will be watched with interest by all mining men of the region, for it is based on ideals of which many men are skeptical. There will be six four-family structures for miners, and each will have a living room, kitchen and bathroom on the first floor and three bed-rooms, with ample closet room, on the second floor. There will be front and rear porches, hot and cold water, electric lights in each house and furnace heat.

The superintendent's home will be placed between the houses for the mine foremen, and there will be a double house on each side for the foremen's assistants. A general store, garage and workshop will be built of the same steel and hollow-tile construction.

One of the big features of the plan will be a park for the miners' families, tennis courts, a baseball diamond, a swimming pool and an athletic field. There will be terraced lawns, hedges and bushes, which will give a landscape treatment to the village, an advantage which other mining towns do not possess. It is the intention of Mr. Dodson to have much care taken of the property, and a groundkeeper will be employed.

Mr. Dodson is a firm believer in giving the best possible surroundings and conditions to his employees and feels assured that when this is done a better class of men and better service may be expected. The work will be in charge of George S. Welsh, an architect, from Wilkes-Barre, Penn., who expects to have the plans completed by about Jan. 1, 1916. The coal operation has been recently started and a breaker, which is one of the finest in the region, has just been erected.

Gardens in Concrete City

At Concrete City the Delaware, Lackawanna and Western R.R. coal department gives rewards every year for the best-kept lawns and gardens. As shown in these four illustrations, the homes are better tended than many residences of the wealthy.

JOHN MARTIN'S HOUSE TAKES SECOND PRIZE

JOHN P. EVANS TOOK FIRST PRIZE FOR THE TASTEFUL GARDEN AND LAWN SETTING WITH WHICH HE ADORNED HIS HOUSE

JOHN ALLEN'S LAWN DRAWS THIRD PRIZE

FOURTH PRIZE IS AWARDED TO WILLIAM WRIGHT

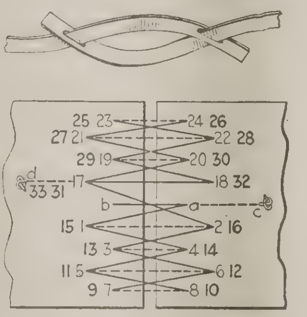
Discussion by Readers

Mining Machinery--Belting

Letter No. 3—I have used a somewhat similar method of lacing belts to that described by "Chief Electrician," *Coal Age*, Aug. 7, p. 227, but differing from his in two particulars.

First, I prefer to begin the lacing of a belt in the center rather than on the edge; and, second, I do not find it necessary to tie the ends of the lace, further than to make a simple knot, as illustrated in detail in the accompanying figure. By starting and finishing the lacing at the center of the belt, the ends of the lace, if they come loose, do not strike passersby or flap against the guardrails. I have always had some difficulty in keeping the ends of a lace tied unless a large and unsightly knot is made.

Referring to the figure, I have numbered the holes in the belt in the order in which the lacing is passed through them, except the two center holes *a* and *b* and the outer holes *c* and *d*, used for knotting the ends. The general position of the holes is the same as that previously described in Letter No. 1.



LACING A BELT

The method of lacing I prefer is as follows: First, to secure one end of the lacing, it is run through hole *a* from the top and carried underneath to hole *b*; this is repeated by running the lace again through holes *a* and *b*. The end is then carried down through *a* and up through *c*, and a simple knot is tied in the end of the lace on the upper side of the belt, as shown in the figure.

Now, taking the other end of the lace, it is passed down through hole 1, up through 2, down through 3, and up through 4, continuing this order to the side of the belt. The lace is passed twice in succession through the holes at the side of the belt, as indicated by the numbering of the holes. Emerging from hole 10, the lace is carried down through hole 11 and up through 12, this order being continued until it emerges from hole 16, when it is carried across the center, missing holes *a* and *b* and run down through hole 17 and up through 18. The same order is continued across the other side of the belt and back to 31 and 32, and finally passed down through 33 and up through the outer hole *d*, where a knot is tied on the upper side of the belt, in the same manner as before.

By this method the lacing presents only parallel lines on the side of the belt next to the pulley, as indicated by the dotted lines in the figure. The full lines in the figure show the lacing as it appears on the upper side of the belt.

The small detail sketch just above the belt, in the accompanying figure, shows a good method of tying together two ends of the lacing, should this be necessary. I may add that the first line of holes in each end of the belt may be set back a short distance sufficient to permit of the ends of the belt being cut off should the belt be required to be shortened at any time.

George N. Lantz.

New Straitsville, Ohio.

[There is one point in which the order of lacing described by correspondent is open to criticism. Let someone suggest what this is and how the order of lacing could be slightly changed to avoid the difficulty. Also, state what would be the tendency of a belt when laced in the order here described.—Editor.]

*

New York Coal Specifications

The issue of *Coal Age*, July 24, p. 132, contained an interesting account of new coal specifications that are to be adopted shortly by the New York City departments. Almost at the beginning of the article an admission is made that the City pays more per ton for a certain grade of coal and secures a poorer quality than certain individual consumers. If observation has brought such a situation to light, it would be the part of wisdom to learn the cause before attempting a remedy. But the article to which I have referred seems to indicate that the city authorities concluded that the fault lies in the specifications and proceeded to correct them. Just how the city expects to lower the price of its coal by elevating its specification standards is difficult for a novice to comprehend.

It is not intended to criticize the transposition of the buckwheat sizes; information has been ample to have justified such a correction years ago. Neither is it the purpose to analyze the new specifications and assemble their inconsistencies. Reference might be made in passing, however, that the "premium" hook is not well baited. For instance, deductions made for excess moisture will not be remitted, although the major tonnage in a given contract may fall materially below the percentage of moisture permissible. Then again, "the total offsetting tonnage shall never exceed the tonnage deductions on the 1-per cent. basis for ash and B.t.u."

In spite of all issues in detail, interest clings to the fact that the city is not a successful buyer in a field where the most talent seems to be concentrated. It is rarely able to secure widely competitive bidding. Some dealers are suspicious of the mechanism of "specifications" in the hands of officials. A superintendent of one of the city departments once admitted to the writer, in explanation of heavier penalties having been imposed in one borough over other districts, that the dealer holding the contract in that borough did not have the good-will of "the boys" and they took advantage of every condition against him. The undeniable inference is that "the boys" were lenient in favored cases. There has been also much criticism, and not without some justification, against the work of the Central Testing Laboratories upon which the city departments depend for their reports of fuel efficiency. The Department of Education requires the dealer to transport and set up cumbersome portable scales at delivery points. Supervision at the dealer's scales would be quite as efficient and cheaper.

But thoughtful consideration of the specification method of purchasing anthracite coal when such a contract cannot secure support from the source prompts one to ask this question, What would be the effect if all buyers of anthracite coal were to impose conditions similar to those adopted by the City of New York? All the anthracite steam coal available for this market is sometimes barely sufficient for the requirements. If one customer or a selected few are to be given the right of choice, they should expect to pay a premium. But is it moral to give preference to a few, in return for a bonus, and serve the balance of the trade at usual prices with the "left-overs"?

M. Gibbs.

——, Penn.

Preventing Mine Explosions

Letter No. 8—I have been much interested in reading the several letters on this subject. In my opinion two main things are necessary in order to reduce the possibility of an explosion occurring in a mine generating gas: First, all mining operations and mine workers should comply with the law in a true sense. Second, mine officials should use sound judgment in respect to every detail of the work, especially the ventilation of the mine in their charge. If these two points are strictly observed, I think it would go far toward eliminating mine explosions.

There are, however, weak points in the bituminous mine law of Pennsylvania (1911), and I will draw attention to some of these which occur to me. Art. 9, sec. 1, of the law requires an air volume of 200 ft. per man per min., and sec. 2 permits 70 men to be employed on a single air split. This makes it necessary to circulate 14,000 cu.ft. of air per min. in a split where the full quota of men is employed. The law is deficient, however, in that it makes no mention whatever of the area ventilated by this split.

Suppose, for example, the split ventilates three butt headings. The air volume required by law (14,000 cu.ft. per min.) is ample when these headings are being driven up and rooms are turned. As the rooms are finished, however, and the work of drawing back the pillars is started, conditions change. Heavy falls of roof occur, and more gas is generated, often suddenly. The air current becomes more charged with gas and may reach the danger point at any time, but the worst is yet to come. The number of men employed in this section is soon reduced to, say 30 men. With this number of men the law requires only an air volume of 6000 cu.ft. per min., which is insufficient in most cases for the proper dilution of the gas given off.

Perhaps there is another section adjoining this one, also drawing back the pillars, and it is decided to throw these two sections into one, employing a total of 40 men and ventilating that section with a current of 8,000 cu.ft. per min. In this case the danger is much increased. The air circulating through this larger area becomes heavily charged with gas, and a blownout shot, with a slight quantity of coal dust thrown into the air, is enough to cause a mine explosion.

Here is where the sound judgment of mine officials must be exercised. The requirements of the law are insufficient for the practical needs in the mine. I recall one case where from 23 to 30 men were working in a certain section generating gas. The law required a current of only 6000 cu.ft. per min. in this section. Instead of that, however, there was an air current of from 18,000 to 26,000 cu.ft. per min. circulated in this split, so as to keep the place safe for work. This air current was circulated around some worked-out and abandoned places, containing old gobs. The instance I have cited is no exception in this state.

Another dangerous condition arises in the use of open lights on the return airways of pillar workings. This is prohibited in art. 10, sec. 1, of the bituminous law. But often sufficient precaution is not taken to prevent open lights from being carried into such places. The safety lamps required in pillar work frequently become an element of danger when an unexpected fall drives a quantity of gas down on the lights. Too often a safety lamp is regarded as providing the necessary protection against the gas generated in the workings, but the test may prove too severe and the lamp must be carefully guarded.

In the effort to prevent the occurrence of mine explosions, all gobs should be ventilated directly into the return airway. No open lights should be permitted to enter the return of any section where roof falls are frequent. No electric pumps or wires should be allowed in the return of pillar work. Wherever possible, doors should be avoided, as a door is a very uncertain thing in the ventilation of a mine. Whenever a small air current is passing through an extended section of a mine it should be carefully watched. As a further precaution, permissible powder should be used and all shots should be fired with a battery.

Another practical point that must be considered in guarding against explosions is the complete removal of all the coal, not only to insure the closing of all abandoned places, but in most cases such a removal of coal will be followed by a surface break that permits the free escape of gas from the strata.

F. M.

——, Penn.

Longwall vs. Room-and-Pillar Mining

Letter No. 3—Referring to G. R. Waddell's Letter No. 2, *Coal Age,* July 31, p. 181, I observe he states that he is "a great believer in the longwall method of mining." There are many others besides, who have strong faith in the general application of longwall to the mining of coal, but Mr. Waddell seems to think that this is the one and only method whose advocates can claim that they are following the motto, "Safety the first consideration."

In my experience, I have worked in several mines where it would be absurd to apply the longwall method for the extraction of the coal. Again, I have seen that method tried in a certain mine in Northumberland, where the coal seam lay almost flat and was of a uniform thickness of 4 ft. throughout. The method, however, proved an absolute failure in this seam, which I could show by giving further particulars, if desired. It may be claimed that there was something wrong, as probably there was; but the real trouble is to be found in the local conditions, which did not permit of a successful application of the longwall method.

I want to say that it is practically impossible to state positively that any one method of mining is the best to employ in all cases. We might as well say that a certain method of mine haulage is the best system to employ in a mine or attempt to advise what is the best boiler to use in a power plant. There are always numerous circumstances and conditions that must modify one's decision in a particular case, and this is very true in coal mining. For that reason, the only way to determine the best plan to adopt in a particular mine is to be guided by the conditions on the ground, and even then the development must be carefully watched to observe the success of the method employed.

Mr. Waddell states that he does not think that "there is any record of an explosion occurring in a longwall mine." I want to draw his attention to the following list of fatal mine explosions, all of which were in mines worked by the longwall system:

Sept. 11, 1878, Ebbw Vale colliery, Abercarne..........	268
Jan. 13, 1879, Dinas pit, Rhondda Valley................	63
July 15, 1880, Risca mine, near Newport................	120
Dec. 10, 1880, Penygraig, South Wales..................	101
Dec. 23, 1885, Mardy colliery, Pontypridd...............	81
Feb. 6, 1890, Llanerch colliery, Abersychan.............	176
Mar. 10, 1890, Morfa colliery, Glamorgan...............	87
Aug. 26, 1892, Park Slip colliery.........................	112
May 24, 1901, Universal colliery, Senghenydd...........	81
Mar. 10, 1905, Clydach Vale	33
July 11, 1905, Wattstown colliery........................	119
Oct. 14, 1913, Universal colliery, Senghenydd...........	427

All of the explosions recorded above occurred in mines located in a single coal field, where the longwall method of mining was thoroughly understood. I have worked in mines employing almost every system of mining known, and if asked which of these methods would be the best for general adoption, I would be compelled to say that I could not answer that question without making a careful study of the conditions existing in the mine.

R. J. Brown.

Fernie, B. C., Canada.

Operations in Longwall

Letter No. 1—Referring to the answer to an examination question asking for a description of the operations in advancing a working place in a longwall face, *Coal Age*, Aug. 14, p. 272, I want to suggest one or two points in which my experience of six years as a mine official in longwall work differs from the method outlined in this letter.

After explaining the duty of the miner to examine carefully the condition of the roof and face of the coal and to reset any timbers that may have been displaced by the falling coal during the night and then proceeding to load the fallen coal, the answer goes on to say, "Having loaded all the fallen coal and cleaned up the face, any new timbers required should be set in position."

I would say that a longwall miner must not clean up all his coal before he sets any new timbers. These should be set as soon as there is room for them. They should be set 4 or 5 ft. apart, as the work of cleaning up the coal proceeds. If the miner waits until he has cleaned up all his coal, he is bound to be working under a great area of unprotected roof. Longwall work is subject to sudden breaks, and it is necessary to keep the face well timbered in order to guard against falling roof.

The answer now goes on to say, "The work of undermining the coal should then be commenced, setting the necessary sprags and timbers as this work proceeds." I would suggest that the miner should set sprags along the coal face before commencing to undermine the coal, so as to keep in place any loose coal that may fall. Miners have been slightly injured at times by small pieces of falling coal because they have not set these sprags before starting to undermine the coal.

The answer further states, "Before leaving the place for the night, the miner draws all sprags or other timbers supporting the coal at the face, so as to permit the gradually increasing roof pressure to break down the coal during the night." I want to ask, How is a mine examiner to examine the coal face for breaks or bad top when the coal is not supported? In my experience the miner leaves his place at night well timbered, and his coal if undermined should be well spragged, so that the mine examiner can make a careful inspection of the working face for gas, open breaks in the roof or loose top, with safety. After the miner has examined his place in the morning and set any necessary timbers to make it safe, he should take out his sprags one or two at a time. He should load the coal that falls and set more timber before taking out the other sprags and loading more coal. By so doing he will never be working under a great area of unsupported roof, but his place will always be well timbered.

Assistant Mine Foreman.

Sullivan, Ind.

[We are glad to have correspondent draw attention to his experience and practice in longwall work. Much depends on the toughness and yielding nature of the roof. There should always be maintained a systematic system of timbering in which the posts are set from 4 to 5 ft. apart in rows paralled to the working face. The posts standing in the row next to the face are liable to be dislodged by the falling coal, and these must be reset before any attempt is made to load coal. In loading out the coal from the longwall face it is necessary to keep the space between the first row of timbers and the face of the coal clear, so that the coal can be transported to the head of the road. When working longwall under a frail roof all that the correspondent has said is true and should be observed. The time of drawing the sprags depends on the length of time required to break the coal. This depends again on the nature of the roof, depth of cover, thickness of the seam and hardness of the coal.—Editor.]

Mining Laws and Legislation

Letter No. 10—I have been much interested in the discussion of the responsibility of the assistant mine foreman, and particularly in the case cited by Oliver Young, in letter No. 7, *Coal Age*, Aug. 7, p. 229. The instance given is one in which a miner was killed by a fall of rock or slate after he had been notified to set the timbers required to make the place safe. Failing to obey these instructions promptly, the miner was killed by a fall which took place shortly after the instructions were given.

Mr. Young asks, "Can this assistant foreman be held responsible for the neglect of the miner, after having given him instructions to make his place safe?" and cites the Pennsylvania bituminous law which makes the miner responsible for the safety of his working place and compels him to keep it in a safe condition or to cease work and inform the mine foreman or the assistant foreman of the danger.

In my opinion the responsibility for the safety of a workman rests equally on the workman himself and on the foreman or the assistant foreman in charge of that section. If the miner knew of the bad condition of his working place before being notified or continued to work there after he was notified of such condition, he is responsible for his own neglect or delay in making the place safe.

It seems to me that in this case, however, the assistant foreman was in part to blame for this accident because he did not remain long enough to see that the miner started to obey his orders and set the necessary timber. Instead of walking away after giving this order, he should have satisfied himself that the work would be done or he should have brought the man out and fenced the place off and prosecuted him for his neglect to obey promptly the order given. Had he done this, the miner would have been alive today.

I would ask, What are the duties of the assistant mine foreman in charge of a section of a mine? Evidently he is placed in charge of that section for the purpose of making it safe for work. He is supposed to visit all working places in his charge once or twice a day. In case he finds a place that is dangerous and cannot be made safe at once, it is his duty to withdraw the men working in that place and fence it off until it can be made safe for work. The assistant foreman's motto at all times should be, "Safety First." If an assistant foreman finds his section is too large for him to give proper attention to each working place therein, he should appeal to the boss for help.

Like Oliver Young, I am a firm believer in a uniform system of timbering, but am sorry to say that too many miners are opposed to this plan, preferring to set timbers where they think they are needed, and too often they do not discover the need until too late. Many times I have had to fence off places owing to bad timbering. In most cases miners when left to themselves will not set timbers until the place actually becomes dangerous. My motto is, "If a place is safe, keep it safe by systematic timbering, and don't wait until the roof becomes dangerous before setting timbers." If this rule was followed, there would be fewer accidents from falls of roof and slate.

JACOB RILEY.

Sullivan, Ind.

* * *

Study Course in Coal Mining

By J. T. BEARD

The Coal Age Pocket Book

PRACTICAL PROBLEMS

Example—A current of 25,000 cu.ft. per min is passing in a shaft mine. The shafts are 8x12 ft. in section and 250 ft. deep. The airways are 6x10 ft. and 15,000 ft. long, including the return. (a) What is the water gage due to this circulation? (b) Assuming the power applied to the fan shaft remains unchanged and the current is divided into two equal splits, at a point 3000 ft. inby from the foot of the shaft, what volume of air may be expected to be passing; and (c) what will be the water-gage reading on the fan drift and at the bottom of the shaft, after splitting?

Solution—The rubbing surface and sectional area of the shafts and airways are, respectively, as follows:

		Sq.Ft.
Shafts—		
Rubbing surface	2(8 + 12)2 × 250 =	20,000
Sectional area	8 × 12 =	96
Airways (total)—		
Rubbing surface	2(6 + 10)15,000 =	480,000
Sectional area	6 × 10 =	60
Main airway—		
Rubbing surface	2(6 + 10)3,000 =	96,000
Sectional area	6 × 10 =	60
Two equal splits—		
Rubbing surface	2(6 + 10)12,000 =	384,000
Sectional area	2(6 × 10) =	120

The relative part potential factors are then:

Before splitting—

Shafts $\left(\frac{1}{X}, \frac{1}{X_p^2} \text{ or } \frac{1}{X_u^3}\right) = \frac{s}{a^3} = \frac{20,000}{96^3} = 0.0226$

Airways (total) $= \frac{480,000}{60^3} = 2.2223$

General relative mine potential factor $\left(\Sigma \frac{1}{X}\right)$ 2 2449

After splitting—

Shafts (as before) 0.0226

Main airway $\frac{1}{X} = \frac{s}{a^3} = \frac{96,000}{60^3}$ 0.4444

Splits $= \frac{384,000}{120^3}$ 0.2222

General relative mine potential factor $\left(\Sigma \frac{1}{X}\right)$ 0.6892

(a) **Water gage** (before splitting)—

$$w.g. = \frac{1}{5.2}\left(kQ^2 \times \frac{1}{X_p^2}\right) = \frac{0.00000002 \times 25,000^2 \times 2.2449}{5.2} = 5.4 \textit{ in.}$$

(b) For a constant power on the air, the quantity varies as the cube root of the mine potential; but, for a constant power applied to the fan shaft, owing to the efficiency of the fan varying inversely as the 3/5 power of the potential X_u, the quantity varies as the 4/5 power of that potential.

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The mine potentials, in this case, are,

Before splitting— $1/X^3_{u1} = 2.2449$; and $X_{u1} = \frac{1}{\sqrt[3]{2.2449}} = 0.7637$

After splitting— $1/X^3_{u2} = 0.6892$; and $X_{u2} = \frac{1}{\sqrt[3]{0.6892}} = 1.1321$

Then, for a constant power applied to the fan shaft, the quantity of air in circulation varies as the 4/5 power of the power potential, which gives for the circulation after splitting

$$Q_2 = Q_1\left(\frac{X_{u2}}{X_{u1}}\right)^{\frac{4}{5}} = 25,000\left(\frac{1.1321}{0.7637}\right)^{\frac{4}{5}} = 34,250 \textit{ cu.ft. per min.}$$

(c) **Water gage** (after splitting)—In the fan drift the gage is

$$w.g. = \frac{0.00000002 \times 34,250^2 \times 0.6892}{5.2} = 3.1 \textit{ in.}$$

To find the gage at the shaft bottom it is necessary to deduct the potential value for the two shafts from the total poential value for the mine after splitting; thus

$$\frac{1}{X} - \frac{1}{X_o} = 0.6892 - 0.0226 = 0.6666$$

Then, since the gage is proportional to this potential factor, the gage at the bottom of the shaft is

$$w.g. = 3.1 \times \frac{0.6666}{0.6892} = 3.0$$

Relative Variation of Factors—The following relation of some of the more important factors in the ventilation of mines by means of centrifugal fans is based on the results of many experiments:

Power on Air Constant (KU = u)—

Unit pressure, p *varies as* Q^2

p *varies as* $\sqrt{X} = \sqrt{\frac{a^3}{s}} = a\sqrt{\frac{a}{s}}$

Quantity, Q *varies as* $\sqrt[3]{X} = \sqrt[3]{\frac{a^3}{s}} = \frac{a}{\sqrt[3]{s}}$

Power Applied to Fan Shaft Constant (U)—

Efficiency, $1/K^5$ *varies as* $X_u^3 = X_p^2 = X = a^3/s$

K^5 *varies as* n^3

Effective power, u *varies as* K

Quantity, Q^6 *varies as* X_u^4

Speed, $1/n$ *varies as* X_u

Mine Potential Constant ($X = a^3/s$)—

Effective power, u *varies as* Q^3

Quantity, Q^5 *varies as* n^4

Water gage, $(w.g.)^6$ *varies as* n^8

Speed, n *varies as* U, practically

Efficiency, K^5 *varies as* n^7

Inquiries of General Interest

Working Thick Inclined Seams

I wish to inquire how you would mine an 86-ft. seam of bituminous coal having an inclination of 18 deg. with the horizontal.

S. P. Dickinson.

San Francisco, Cal.

Illustrations of such mining are to be found in the St. Etienne coal field of France, where seams of varying thickness and inclination occur. One of these, the Grand Couche, is 82 ft. thick in places and has an inclination varying from 30 to 90 deg. This seam is reached by cross-measure drifts driven from a vertical shaft to strike the seam. When these cross-tunnels reach the middle of the seam horizontal levels are driven to the right and left on the strike of the measures. The seam is then divided into panels by driving inclines about 400 ft. apart, center to center. These are driven up the pitch to strike the level of the lift above. A similar incline is then driven up the center of each panel. These inclines are driven on the full pitch and about in the middle of the seam.

The coal lying in the seam between two consecutive lifts is now divided into, say four or five equal stages, each stage being worked separately in about five substages, the substages having each a height of 6 or 7 ft. for convenience in timbering. The stages are worked in order, from the top of the panel downward, the upper stage being about one-third worked out when the stage next below is started. The substages are worked in order from the bottom of each stage upward, until the coal in that stage is exhausted.

The method of extraction in each stage is as follows: Beginning at the bottom of the upper stage of the panel, crosscuts are driven from the center incline horizontally across the seam. The work of extraction is then begun, simultaneously, at the head of each of these crosscuts, by driving levels to the right and left the entire width of the panel, a distance of nearly 200 ft. As these levels advance, they are followed by other levels in succession, the head of each level being a few yards in advance of the next one outby. This creates a stepped longwall face in each half-panel, which is worked out on the retreating system. The entire coal in this substage is thus taken out back to the middle of the seam, the space being built in with refuse or filling brought from the surface, as the work proceeds.

The work on the next substage above is commenced by driving crosscuts, as before, in both directions from the center incline; but these crosscuts are driven a little to one side of the crosscuts below, so as to rest on the coal not yet taken out and on the refuse in the worked-out portion below. In this manner the substages are worked out successively, the coal being replaced by material brought from the surface or by the refuse of the seam. While at work the miners in each substage above stand on the refuse or building in the substage below. The filling of this refuse must be done in a careful manner. The packwalls must be built as solid as it is possible to make them. In the system here described, the work of extraction is being carried on in three successive stages at the same time.

In the case cited by correspondent and illustrated in the accompanying figure, it may be assumed that the seam outcrops on the property. In that case the mine should be opened by an incline or slope driven in the middle of the seam. The accompanying figure is a diagram and shows but a single main slope driven in the middle of the seam. This is shown in cross-section on the right and in elevation on the left. It is advisable, however, to drive three or four parallel slopes, the center slope or slopes being used for haulage, while those on either side are employed for manways, ventilation and drainage. The same system may be employed as that just described and in use in the French mines.

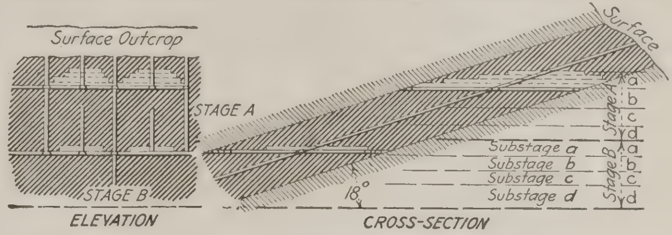

DIAGRAM SHOWING METHOD OF WORKING THICK INCLINED SEAM

In the figure two stages are shown, the upper being stage *A* and the lower stage *B*. Each of these stages is divided into four substages, marked *a, b, c, d*. The development in the upper stage is shown as having progressed further than that in the lower stage.

The seam is first divided into panels by driving the main slopes from the outcrop, about 400 ft. apart. These slopes are driven in the middle of the seam and correspond to the main inclines previously described. The panels are now completed by driving levels or lifts on the strike of the seam, at certain specified distances apart. Inclines are driven up the center of each panel, as indicated in the elevation on the left.

Now, beginning at the bottom of the upper stage in each panel, level crosscuts are driven, as previously described, in both directions from the center incline. The work of extraction is begun at the head of each crosscut by driving levels to the right and left across the entire width of the panel. Other levels follow these, as has been described, the face of each level being a few yards behind the one preceding so as to form a longwall face on the retreating plan.

The success of the method here described depends to a very large extent on the care and thoroughness observed in packing the space previously occupied by the coal. It will seldom occur that the refuse of the seam will be sufficient for this purpose and the necessary material must then be brought from the surface.

Examination Questions

Miscellaneous Questions

(Answered by Request)

Ques.—(a) What dangers arise in dusty mines from the blasting of coal and the lack of judgment in placing holes for blasting the coal? (b) Would you consider it safe to permit blasting to be done in mines generating explosive gas? (c) If so, what percentage of gas would you consider safe, and under what restrictions would you permit blasting?

Ans.—(a) The danger of blasting coal in dusty mines consists chiefly in the dust being thrown into suspension in the air by the force of the blast and the dust cloud thus formed being ignited by the flame of the powder and gases projected from the hole. The ignition of the dust causes a local explosion that may, under favorable conditions, be extended throughout the mine and cause a mine explosion. Bad judgment in the placing of shots or in the amount of powder required to charge the hole may result in a blownout or a windy shot, either of which is always dangerous in a dusty mine.

(b) When blasting coal in a mine generating explosive gas, special precautions must be taken to avoid trouble. Only permissible powders should be used, and all shots should be inspected, charged and fired by competent shotfirers after the men have left the mine. The shotfirers should use moderate charges of powder and tamp the holes with clay. They should start to fire the shots on the return end of a section of the mine and proceed in order against the air, giving time for the explosive gases and dust to be carried away before firing each successive shot. A shotfirer should refuse to fire any hole that in his judgment is unsafe. He should examine each place for gas before firing a shot therein.

(c) It is difficult to say what percentage of gas can be considered as the limit for safe blasting in mines. Much depends on the dusty condition of the mine, the fineness and inflammability of the dust, the kind of powder used, and the precautions taken in charging and firing the shots. In hard-coal mines, blasting is performed safely in 2 per cent. of gas, while in the mining of soft, inflammable coal producing much fine dust, blasting becomes dangerous when the gas falls below 1 per cent.; and it is important then to ascertain that there is no accumulation of gas at the face, before firing a shot. Under these conditions, blasting should only be permitted when all of the precautions mentioned in the last answer are observed.

Ques.—Under what conditions would the use of open lights be safe in gaseous mines, and under what conditions would you forbid the use of open lights in such mines?

Ans.—When it is impossible to prevent the possibility of gas accumulating at the working face or above falls, or in other void places in the mine, locked safety lamps should be used exclusively. Also, in mines where gas is generated in such quantities that there would be danger arising from a possible derangement of the air current for a short time, caused by the setting open of a door or an unexpected fall of roof in an airway, or other unavoidable cause.

Ques.—How would you prove that a potash cartridge is fit for two hours' work?

Ans.—If the cartridge has not been used, it would be necessary to disconnect the seals, shake the cartridge and if the contents were loose and rattled freely, it may be considered as good for two hours' work, but this can only be proved by using it for that time in an apparatus properly charged at 120 atmospheres and giving off 2 liters of oxygen per minute.

Ques.—How would you prove that the oxygen cylinder is charged sufficiently for two hours' work?

Ans.—By opening the main valve and examining the pressure gage. If the cylinder is properly charged, the gage will register 120 atmospheres or more. Then, try to determine by the water gage or meter that 2 liters of oxygen per minute is being released or given off, as 120 atmospheres at 2 liters per min. will last two hours, providing all joints are tight and there is no leakage.

Ques.—What is the last thing you would do before turning on the oxygen supply, supposing you were on the point of entering a danger zone?

Ans.—Examine all connections to determine that they are air-tight; inflate the breathing bag from the outside air: then turn on the oxygen and examine the gage and rest a few minutes until breathing is normal and obey the leader.

Ques.—When would you retire from a dangerous zone if you were one of a rescue party?

Ans.—If my apparatus was working satisfactorily, I would obey the leader, but would consider it time to retire when one-third of my oxygen was used, regardless of time or distance from fresh air.

Ques.—What is the purpose of the emergency valve or bypass and when should it be used?

Ans.—The purpose of the emergency valve or bypass is to enable the wearer to supply the breathing bag with oxygen direct from the cylinder, in case the reducing valve got out of order and failed to supply the necessary amount of oxygen required. It should only be used in cases of emergency.

Ques.—A sinking bucket is 4 ft. 6 in. deep, 3 ft. 3 in. in diameter at the top and 2 ft. 9 in. at the bottom. What is the cubical contents of the bucket, and what weight of water will it hold?

Ans.—The bucket is 54 in. deep, 39 in. across the top and 33 in. at the bottom. It is therefore the frustum of a cone, and its cubical contents is

$$Vol. = 0.7854 \times \frac{54}{3} \times \frac{39^3 - 33^3}{39 - 33} = 55{,}092 + cu.\ in.;$$

or 55,092 ÷ 1728 = 31.88 cu.ft.

Since water weighs 62.5 lb. per cu.ft., the weight of water that the bucket will hold is 31.88 × 62.5 = 1992.5 lb., or say 1 ton.

Coal and Coke News

Harrisburg, Penn.

The Interstate Commerce Commission on Sept. 3, postponed until Dec. 1, the effective date of its order reducing freight rates on anthracite railroads. The order was to go into effect Oct. 1.

In their petition asking for an extension the anthracite roads expressed a general intention to comply with the reduction, but suggested that a complete checking of the proposed tariffs required labor and time. The commission, following its custom in important cases, decided to grant the extension. A thorough checking of the tariffs may lead to further requests for minor modifications, but it was believed here today that for the present there is no prospect of litigation by the railroads to test the order.

It is predicted here that the price of anthracite promises to be as high, or higher, this winter, and those who have postponed buying their coal in the hope of getting cheaper prices for Oct. 1 will be disappointed. The new transportation rates for anthracite entailed a cut of 10 per cent.

Railroad men connected with anthracite carriers expressed great satisfaction with the delay. According to the railroads, there has been a big falling off in earnings on anthracite transportation since the drastic decision was handed down last month. The individual consumers postponed their orders, they said, and thereby caused the retailers and jobbers likewise to curtail orders.

October and November are big months in the anthracite business. It appears now as if the railroads by getting the prevailing old rates for transportation during these two months, will practically not suffer at all this calendar year as the result of the commission's decision.

The railroads, in the order in which they will profit by the postponement of the new transportation rates are the Lehigh Valley, the Reading, the Lackawanna, Delaware & Hudson, Central R.R. of New Jersey, Erie, Pennsylvania and Ontario & Western. The assumption that a cut of 10 per cent. in the transportation rates after Dec. 1 will cause a cut of 10 per cent. in the price of anthracite to the consumer is contested by the railroads. They maintain that the public will have to pay the same prices in any event and that the gain will go wholly to the retailers and jobbers.

August was a third month of low anthracite production, although there was slight improvement over the previous month, and it is probable that the total output for the first 8 months of the year is nearly 2,000,000 tons less that for the first 8 months of last year. This will mean an anthracite shortage at certain points later in the year, as it is impossible to produce, prepare and ship the coal to market as fast as necessary unless the demand is fairly evenly distributed throughout the year.

The official figures of the amount of coal shipped to market by the initial railroads will be sent out this month from Wilkes-Barre by the Anthracite Bureau of Information, which has absorbed the Bureau of Anthracite Statistics hitherto located in Philadelphia.

While the official figures will be announced later in the month, the amount shipped to market will probably fall short of the tonnage in August 1914, which was 5,483,743 tons. From this time on the demand for anthracite should be more brisk, and both dealers and consumers will begin to stock up so as to avoid a shortage later in the season.

PENNSYLVANIA

Anthracite

Hazleton—The colliery machine shops in this region are having difficulty to keep a full complement of employees, as many of the men are being attracted by the high wages offered by plants working on war material.

Wilkes-Barre—Over 200 mine workers, principally natives of the warring European countries took the examination for certificates as miners here on Aug. 29, preferring to work in this country than to fight in Europe. While the applicants appeared eager to pass and obtain the coveted certificates only one-third of them were able to reach the required standard of knowledge that would insure the safety of themselves and fellow employees as practical miners.

Wyoming—Several hundred men and boys employed at the Westmoreland colliery of the Lehigh Valley Coal Co. went out on strike on Aug. 30, following the refusal of several workmen to obtain buttons of the union by either joining the organization or paying back dues.

Pottsville—The mines of the anthracite region still continue to experience great difficulty on account of flooding due to the excessive rainfall of the past summer. In several instances the accumulation of water has been such that the pumps at some of the collieries could not cope with it and as a result numerous shutdowns have resulted. In the vicinity of Shenandoah City the pumps could not begin to keep the water down and as a consequence a number of these machines were submerged. New pumps have been sent in and are being installed as rapidly as possible. Men of long experience in mining state that the continuous high water is the worst in the history of the region, and is costing the operators heavily.

Plymouth—All of the collieries of the Wyoming Valley are operating on nearly full time, the demand for coal being good. Collieries of the Delaware & Hudson Co. have been operated on good time for several weeks past, the Plymouth division producing an unusually large amount of coal. The breaker at No. 5 colliery has been closed for repairs for several weeks, but coal produced at this colliery is being prepared at No. 2 breaker at which double time is the rule. Several hundred mine workers at No. 5 colliery of the same company at Parsons will be thrown out of work until Nov. 1, by the closing of this colliery. Repairs will be made to the breaker and the capacity will be increased so as to care for the coal taken from the Baltimore tunnel. While repairs are being made at Baltimore No. 5, the coal mined at No. 5 will be prepared at the Baltimore Tunnel breaker which will be abandoned after Nov. 1.

Bituminous

Bradenville—The No. 1 mine of the Atlantic Crushed Coke Co., near Bradenville, Westmoreland, Co., Penn., has reopened in full after a long shutdown. The Atlantic company also expects to resume operations at its No. 3 mine. With the opening of these two mines the Atlantic company will have in full operation three plants as the big New Derry plant is operating with as many men as can be had. The Duquesne plant of the Bradenville Coal & Coke Co. at Bradenville is running full. Numerous and extensive improvements are being made at this plant.

Uniontown—Charles Ford, of Jefferson Township, Fayette County, Penn., has sold to the H. C. Frick Coke Co. ten acres of coal underlying his farm for $800 per acre. A large portion of the $8,000 consideration was paid in cash on the consummation of the deal. The property is located near Braznell.

Connellsville—The coke production of the Connellsville region recently rose to 391,000 tons per week, being a gain of approximately 9,000 tons over the previous week. Merchant ovens are now operating up to the average of 1913 which was one of the best years in the coke business.

Charleroi—The Hazel Kirk and Dunkirk mines of the Pittsburgh-Westmoreland Coal Co. at Charleroi recently resumed operations, giving employment to about 400 men.

Altoona—The Pennsylvania R.R. Co. is using every inch of available space in this district for the storing of fuel. Great piles of coal containing thousands of tons are being stored at South Altoona and at the lower end of the yards, and it is believed that the Pennsylvania will continue to store fuel until all available space is filled. Precautions are being taken to pile the coal in such a manner that the danger of spontaneous combustion will be reduced as far as possible. Other large railroads are storing coal but Altoona is the principal storage place in this district for the Pennsylvania system.

WEST VIRGINIA

Clarksburg—The Consolidation Coal Co. recently paid its miners for work done during the first half of August. This pay in the Clarksburg district amounted to $50,000, but was not considered a heavy payroll. Difficulty has been experienced in securing enough cars and boats to take care of the tonnage. This condition has been bettered somewhat, and September tonnage promises to be heavy.

Huntington—The August loading of the Chesapeake & Ohio R.R. totalled 2,420,630 tons, as against 2,232,305 tons in July. It had been anticipated that the August loadings would reach the 2,500,000 ton mark, and the actual loading was a close approximation to this figure. At the present rate of increase, the total tonnage for the current fiscal year will reach approximately 25,000,000 tons. Usually the coal loading falls off after July and August, but this year some operators affirm that the new pace is to be maintained, and that the total for the fiscal year ought to be nearer 30,000,000 tons than 25,000,000 tons.

VIRGINIA

Lynchburg—Trial of 17 ejectment cases instituted in the Federal district court here against 1,200 defendants, by the Virginia-West Virginia Coal Co., of Charleston, W. Va., will begin shortly. The plaintiff is seeking to oust occupants of coal lands to which it claims the title, occupancy dating in some instances as far back as the Civil War. By agreement, two cases will be tried as test cases, and judgment will be entered in the others accordingly.

ALABAMA

Birmingham—A bill has been introduced in the legislature by Mr. Rogers, of Sumter County providing for the working of convicts in the development of the coal mines owned by the University of Alabama, and that an appropriation of $250,000 be made to establish a system of mining the coal lands of the University. The school owns a large quantity of coal lands along both sides of the Warrior River, and the opening of lock 17 gives access to the sea.

KENTUCKY

Louisville—The Harlan Coal Mining Co., of Louisville, has had a successful contest under way whereby dealers are being interested in the choice of a name to be used by the company in connection with its leading domestic coal, mined in Harlan County, Ky. The company offered a car of its coal as the prize for the winning suggestion. A great many dealers submitted names, and the contest will be hard to decide. The company has announced that in order to permit additional names to be submitted, the date for closing has been changed from Sept. 1 to Sept. 15. As the coal market is rising at present, the value of the prize is also ascending, and competition for it is naturally keen.

The Cumberland Telephone and Telegraph Co., with headquarters in Louisville, has begun the construction of an important long distance line from Hazard to Jenkins, Ky. The line will be by way of Cornettsville, Blackey, Whitesburg, Kona, Seco, Fleming and McRoberts. At present the Elkhorn and Boone's Fork coal fields are entirely out of reach of Louisville by phone, and the extension will prove of great value to all those interested in the coal industry.

Hazard—One of the best indications of improved coal business in eastern Kentucky is the fact that a car shortage has made its appearance in that district. Operators on the Louisville & Nashville report that they are having trouble getting sufficient cars, and their neighbors in West Virginia are also experiencing a similar shortage. The mines are running five or six days a week, and the demand is so good that the railroads are having trouble taking care of the business.

OHIO

Coonville—Reports indicate that the mine near here, which is and has been for some time in the hands of a receiver, will shortly be reopened, in order to take advantage of the fall and winter business.

Columbus—One of the features of the Ohio State Fair, recently held at Columbus, was the display of the efficiency of mine rescue apparatus by the Ohio Mining department. Under the direction of Chief Inspector J. M. Roan, a deputy entered a glass cage with two guinea pigs. Equipped with the apparatus the deputy was able to withstand carbonic acid gas while the guinea pigs suffocated.

The New York Coal Co. has filed two suits against the Sunday Creek Coal Co. in the Franklin County courts to collect $13,116 and $20,000 respectively on royalties claimed to be due for coal mined, calculated on the basis of 10c. per ton.

Lost Run—The Essex Coal Co., of Columbus announces that coal will be loaded from the new mine at Lost Run in Hocking County shortly. Another opening is being made within a mile of the Lost Run mine, which will be in operation in 30 days. Each of the new operations will have a capacity of 800 tons daily.

West Wheeling—The West Wheeling Coal Co.'s mine, which has been working only about 25 men, is ready to resume in full with promise of a steady run. When working to capacity, this mine employs about 100 men.

Blairsville—The Graff Bros. are operating all their mines to their full capacity, and it is stated that they could use 300 more miners at the present time. The total capacity of these mines is about 7,000 tons per day.

Athens—Officials of the Pittsburgh Coal Co. recently announced that Mine No. 10 would begin operations shortly. This mine has been idle for nine months, and will employ about 300 men. Other mines around the city, except those of the Sunday Creek Co. are working well.

ILLINOIS

Oliver—The people near Oliver who have given coal leases on their land to the Coal Hill Coal Co. were recently notified that the leases were to be transferred to the St. Marys Coal Co., which would buy the coal rights at once, with the intention of developing the field.

Lenzburg—An involuntary petition in bankruptcy has been filed in the United States District Court at Danville, Ill., against the Tirre Coal & Mining Co. of this place. The petitioners are Mrs. Mollie E. Tirre and F. E. Tirre, both of St. Louis, and William F. Zager, of Lenzburg. Mrs. Tirre alleges that she loaned the company $14,441. F. E. Tirre says the company owes him $1,680 and is unable to meet its obligations. Adam Karr, Theodore Karr and Fred Engelke, of Belleville have obtained in the Circuit Court at that place a distress warrant against the company on the allegation that it is indebted to them $1,727.69 for rents and royalties.

MONTANA

Great Falls—A petition has been filed in the district court by the Brown Coal Co. of Sand Coulee, asking that the court grant an injunction restraining William Pattkovitch and his wife, Mary, from interferring with the plaintiff or its employees. The petition alleges that Pattkovitch and his wife have threatened the lives of the plaintiff's employees for trespassing on the land they are farming. The company claims to have leased the land from the owner, who reserved the surface rights, except to permit the necessary operation of the coal, Pattkovitch and his wife drove the agents of the company from the land.

WASHINGTON

Seattle—At a recent meeting in Seattle of 75 per cent. of the coal producers of the state, the Coal Producers Association was organized. The object of the association is to increase the demand for coal produced by the mines of Washington, actively campaign for the extended use of coal and to promote legislation that will result in restoring the duty on foreign coal brought into this country, or put it on the same basis as that imposed on shipments of coal from this country into foreign countries, to conduct negotiations with various railroads looking to the securing of equitable rates to all points and on all railroads, particularly as compared with freight rates from other states or foreign countries into this state. It is expected that all the small as well as the large coal operators of the state will become active members. The mines of Washington, it is asserted, have not been working more than half time during the past year owing to general depression of business and the introduction of oil during the past few years. The matter of extensive advertising by the association, through magazines, newspapers and billboards of the advantages of the use of local coals and the support of home industries, to offset the heavy advertising of British Columbia coals, was discussed and arrangements made for an assessment of the Washington coal companies to raise a sufficient sum to cover the state with advertising next year.

FOREIGN NEWS

Amsterdam, Holland—It was recently reported that the miners in the Charleroi district and in Hainaut, Belgium, have ceased their strike and returned to work. The demand of the miners for increased wages was granted, the employers steadily refusing the offer of intervention by German soldiers.

PERSONALS

John Harshman, formerly superintendent for the Tower Hill-Connellsville Coke Co., is now superintendent for the W. J. Rainey Co., at Mount Braddock, Penn.

Charles H. Crocker, of Johnstown, Penn., was recently appointed mine inspector by Governor Baumbaugh. He will assume his duties Sept. 18, with headquarters in Blairsville, and will have charge of the new field in district No. 13, including part of Indiana and Westmoreland Counties.

Kenneth Ream, a 12 year old boy from mine No. 38, Seanor, Penn., carried off the individual prize in the Berwind-White employees' first aid contest held recently. Young Ream was entered in the problem contest set by the Du Pont Powder Co. and won over much older and more experienced competitors. The prize was a solid gold scarf pin.

INDUSTRIAL NEWS

Birmingham, Ala.—Wage workers of the bankrupt concern known as the Wadsworth-Cahaba Coal Co., who were preferred creditors recently received 50 per cent. of the money due them. There were 94 such creditors, the amount due being $2,500.

New Orleans, La.—It is stated that the Pratt Consolidated Coal Co. of Birmingham, represented in this city by the New Orleans Coal Co., will before long put into operation a through barge service from the Alabama fields to New Orleans.

Philadelphia, Penn.—A cargo of coal was recently shipped from Philadelphia to Africa, carried by the British steamship "Strathgarry," clearing from this port for Algiers. The cargo was valued at $17,955.20 and was loaded at the Greenwich coal piers.

Hickman, Ky.—After considerable delay due to protests filed by consumers at Hickman, Ky., and other points, the Nashville, Chattanooga & St. Louis R.R. has been permitted to make effective increases in the rate from mines on its road to Hickman from $1.20 to $1.50.

St. Louis, Mo.—Members of the St. Louis Coal Club were the guests recently of the M. W. Warren Coke Co. and inspected the new $2,000,000 by-product coke plant of the company, now in operation at Corondelet, on the Mississippi River, in the southern part of the city. The Warren company's product is becoming a formidable competitor of anthracite. It is handled by most of the St. Louis dealers.

New Orleans, La.—Six 500 ton barges are being built at Slidell, La., by the Salmen Brick & Lumber Co., for Henry DeBardeleben, head of the W. G. Coyle Coal Co. of this city, to transport Sipsey coal from Cordova to Mobile and thence to New Orleans. Other coal companies operating in the New Orleans territory are considering the establishment of barge lines from New Orleans to the coal fields of Alabama.

Great Falls, Mont.—A hearing was held here recently by the Montana Railroad Commission, upon the petition of the Nelson Coal Co. for better rates for their product from Sand Coulee over various lines of the state. The Commission has been petitioned to grant from 30 to 40 days during which time the various parties to the hearing will file their briefs. A decision on the matter will not be forthcoming for several weeks.

Philadelphia, Penn.—The Pennsylvania R.R. Co.'s supply of empty coal cars has been insufficient to meet the demands put upon it for the storage of cars of bituminous coal in desired quantities along its lines. Accordingly great piles of coal are being made at various points between Philadelphia and Harrisburg and on the middle division east of the soft coal region. These heaps of coal far surpass anything of the kind ever seen in Pennsylvania before.

Middlesboro, Ky.—The Louisville & Nashville R.R. has added another through freight crew from Corbin to Norton. This brings the total number of crews up to any previous record. Most of the coal mines in the Middlesboro district are operating five to six days per week, as against an average of less than three days for several months. Mines producing commercial coal have plenty of contracts and some are refusing contracts running over long periods.

Philadelphia, Penn.—The owners in this city have been advised that the coal barge "J. B. Walker," which left here a few days ago with a cargo of anthracite for Portsmouth, N. H., was compelled to put into the Delaware Breakwater on account of bad leaks developing, which together with serious trouble to the pumps endangered the vessel. It is expected that it will be necessary to beach the boat, as it has not been found possible to decrease the amount of water in her hold.

St. Louis, Mo.—The Missouri, Kansas & Texas Ry. Co., with headquarters in this city, has let a contract to Dorset Carter, of Oklahoma City, Okla., for 800 cars of coal a day. Machinery is being installed at Lehigh for stripping the coal. For this purpose one of the largest steam shovels ever made is to be used. Its capacity is 7 cu.yd. The land from which the coal is to be taken is five miles from Lehigh. The strip pit is three and a half miles long. A railroad spur has been built from Lehigh to the field.

Rockport, Ky.—A movement has been started in the western Kentucky coal district to construct a highway from Beaver Dam to Central City, and to call it the duPont Highway, in honor of one of the leading owners of coal mining properties in the district. The managements of the coal companies along the route of the proposed road are much interested in the movement, and a meeting was held at Rockport, Ky., Sept. 4 for the purpose of completing details of the project.

Frankfort, Ky.—The Kentucky Railroad Commission has decided to approve coal rates on the Chesapeake & Ohio R.R. from originating points in eastern Kentucky on a sliding scale basis with five miles as the unit. The road operates over the Ashland Coal & Iron road for 22 miles east of Ashland, Ky., and at this point a wide range of charges has been in effect. The commission was asked to equalize these rates, and instructed the road to file a tariff based on a sliding scale, as was done some time ago in a western Kentucky coal case.

Pittsburgh, Penn.—Coal dealers in western Pennsylvania, believing that the storage of coal by the Pennsylvania and other railroads is significant of the possibility of labor trouble in the mines next spring, are laying up large quantities themselves. All available storage room the wholesalers have is being filled with various grades of coal for the coal men view with uncertainty the attempts that will be made next April to renew the four-year agreement, that then expires between the producers and the United Mine Workers. The large mining companies are storing millions of tons in an effort to be able to meet the increased demand this winter. More coal is being exported from the country than ever before.

Olympia, Wash.—County Assessor Sams, of Thurston County Washington is contemplating a systematic coal survey of the county. This action is the direct result of the board of equalization, failing to reduce the assessment of the Washington Union Coal Co., of Tono which asked a reduction of $56,000. The case is an interesting one, as the coal company now threatens to sue the county, and it is not definitely known whether the lands of the company contain deposits of any great value or not, although it is generally thought that they do. If the company sues the county, it will be up to the county to show that the lands do contain large deposits, and this will greatly increase the value of the lands to the company, at the expense of the county. The stated object of the survey is to locate other lands that are believed to be valuable.

Pittsburgh, Penn.—By an agreement filed in the United States District Court the opposition which the Pennsylvania R.R. has waged against the Wabash R.R. has ceased. The document which has just been approved by the court provides for a switch connecting the lines of the Pennsylvania with those of the Wabash at a point 11 miles outside this city. By this connection 3,400,000 tons of bituminous coal originating on the Wabash road will have access to the markets reached by the Pennsylvania R.R. Thus has ended a fight of many years, which was begun by the Pennsylvania before the Wabash even got into Pittsburgh and has continued ever since. While the Wabash has had connections for a long time with other roads in this territory, the shippers of coal were not satisfied until their product had an outlet into the Pennsylvania territory.

Anaconda, Mont.—Complete electrification of the Washoe coal mine, belonging to the Anaconda Copper Mining Co. is now under construction. The electric power plant will consist of a 150-kw. turbine generator, the power of which will operate the tipple. Later on, more generators will be installed as the work of electrification nears completion. The company is preparing to embark in the commercial coal business on Oct. 1. Shaker screens of five different sizes are being installed for the following grades of coal: Lump; egg; No. 1 nut; No. 2 nut and slack. Three new bunkers to hold 225 tons are being built for the nut and slack coals, while the old tipple is being reinforced for use in loading the egg and lump coal. Six hundred tons of coal are being mined per day at present, and the increased production from the No. 3 vein, now under development will increase this to 800 tons before winter. Heretofore the Copper company has used its entire product itself, and this will be its first venture into the commercial field with coal.

Coal Trade Reviews

General Review

Fall buying of anthracite opening up. Bituminous feeling the impetus of the improved industrial conditions. Profitable figures on export business. Lake trade shows a gratifying increase. Notably better tone in the Middle West.

Anthracite—The return of householders from summer vacations started coal moving into the consumers' bins, and there is a noticeably better feeling in anthracite circles. Most of the new business has gone to the independent operators at their cut rate figures, but they are now covered with orders close to capacity, and are taking a notably firmer position as regards prices. Moderate concessions will continue the rule until well into the winter, as is always the case, but it is noted that conservative dealers are generally planning to carry full stocks through to Apr. 1, when the new wage scale comes up for consideration. Long-term credits continues to exert an unsettling influence on the market, but the announcement that the new rate decision will not become effective until Dec. 1, has restored confidence of the buyers for the time being.

Bituminous—The bituminous trade is slowly responding to the improved conditions, and there is sufficient business now on hand to keep the accumulations at the loading piers down to a healthy basis. The movement on regular contracts is larger, and manufacturers are showing a disposition to follow the example of some of the larger railroad systems by accumulating surplus stocks. There is less demurrage coal at the distributing centers, and the trade is maintaining an even price level though there is still a slight indication toward heaviness. On the better grades it is generally agreed that they are in a strong position for the balance of the season.

Exports—The off-shore business continues brisk with inquiries plentiful. It is now developing that most of this business is being negotiated at about 10c. per ton above ruling figures on domestic contracts, and generally with the understanding that payment be made before shipment. High ocean freights continue the ruling feature in this branch of the trade. In the coastwise service, quotations on vessel tonnage are nominally unchanged, but are undoubtedly stiffer and susceptible to the least intimation of any general expansion in the demand for vessels.

Lake Markets—There has been a general and decided impetus to the Lake trade, as the end of the season approaches, and it is expected that this will now continue about normal until the close of navigation. Reports from the Northwest are to the effect that coal is moving out to interior points much more freely, and the situation in this department is decidedly more cheerful, though the tonnage for the season will undoubtedly show a heavy loss. Fuel consumption in iron and steel lines in the Pittsburgh district is probably very close to the maximum. The improvement has also spread to the domestic trade, though to a lesser degree. The cool weather has started coal moving out of the retail yards, forcing the dealers into the market, and there is a tendency to buy more freely.

Middle Western—The first half of the current month has witnessed a gratifying expansion of business with renewed activity, and there is a genuine feeling that the market has taken a definite turn for the better. There are quite a few companies that are carrying over some low-priced business from the recent period of depression, while the new advanced circulars have had a tendency to restrict buying, but this is generally regarded as only temporary, and a vigorous demand is expected to develop before the end of the current month. The screenings situation continues to drag, the larger domestic demand having resulted in an increased production of screenings as well. The current market in the Middle West is characterized by a generally close adherence to list prices, and a snappy demand.

A Year Ago—Anthracite trade steadily improving as the season advances. Operations active and the full circular prevails. Bituminous steam trade disappointing in all parts of the country, but operators continue confident as to the future. Market well maintained. Domestic grades beginning to open up as the season advances.

BUSINESS OPINIONS

Boston News Bureau—The sensational position of sterling exchange not only tends to restrict business in exchange, but in all branches of trade save those engaged in producing war munitions. War orders for the allies are being received in such volume that even a loan of $500,000,000 would not restore sterling exchange to the normal. As it is, exchange is accumulating and is being pressed for sale on a market where there is no demand of consequence. Few men are found who are willing to predict the course of trade or prices the next few months. Money is becoming so abundant that the banking element is extremely confused as to how to invest its idle surplus. We are still dominated by war developments. Fundamental conditions could hardly be more encouraging. We are rich in money and products and these resources must finally restore confidence. The present resting spell may prove beneficial.

Iron Age—A significant turn in the steel trade is the beginning of rail orders for spring rolling. The Louisville & Nashville has bought 43,000 tons from the Steel Corporation and the Atlantic Coast Line 20,000 tons for such delivery. The New York Central Lines are taking up their next year's requirements, and an Eastern road is figuring on rollings before winter for rails it will lay in the spring. The steel industry is makink new production records. In August the Steel Corporation produced more ingots than in any other month. Its statement of unfilled orders is expected to show an increase for August, but only a moderate one in view of the large amount worked off in the month.

American Wool and Cotton Reporter—Waiting for the London sales to open and also for word in regard to the embargo on crossbred wools largely influenced the course of the wool market last week. Partly owing to the week-end holiday there was less activity than usual. As a limited quantity of crossbred wools may be exported from London, it is expected that some of these will arrive in the American market within a few weeks.

Marshall Field & Co.—Improvement and better feeling have been apparent in dry goods trading during the week, due in part to more seasonable weather for retail selling and for the maturing of crops. Wholesale shipments have about equaled the unusually heavy distribution of the corresponding week a year ago. More retailers have visited the market, and collections are normal. Our retail sales this week have been especially heavy.

Dry Goods Economist—Importers are naturally gratified at the action of the British Government in permitting the shipment to this country of all goods bought or contracted for by American firms from German and Austrian houses prior to Mar. 1 last.

Bradstreet—Growth in trade and in leading industries is of a cumulative character. Misgivings as to the future seem to have practically disappeared, and though there are some unsettling factors, such as the very weak condition of foreign exchange and the fickleness of labor, the general tendency is onward and upward. This week's chief stimulus to trade is furnished by fall festivals, by visits of country merchants to the larger centers, improvement in house trade, larger road orders, rather freer orders for fall delivery, and by still geater activity in the steel industry.

Dun—Restraint upon new enterprise slackens as international diplomatic relations improve, but the derangement of foreign exchange continues a distrubing element in financial and export circles. Depreciation of European funds in this market has reached the stage where interference with oversea trade is threatened, although no actual check to merchandise shipments has thus far occurred. Important problems, however, are diminishing in number and there is a growing belief that current business progress will not be seriously impeded. Even the notable revival of activity in some directions is less impressive than the general restoration of confidence, without which a return of full prosperity would not be possible.

ATLANTIC SEABOARD

BOSTON

Pocahontas and New River have become generally firm, with only light accumulations. An optimistic feeling is now generally apparent. Georges Creek unchanged but Pennsylvania grades show slight improvement. Anthracite begins to move to the consumer and wholesale trade is looking up.

Bituminous—Practically no shading has been reported on the standard grades and all the important shippers have such an amount of business in hand that accumulations of coal at the loading piers are relatively small. The export trade is steadily improving and the balance of 1915 will probably show the record tonnage for foreign clearances. A few of the agencies are accepting what little spot business offers at $2.85 f.o.b. for coastwise delivery, but not so much because they need business as to keep in touch with New England buyers.

Little is heard about possible proposals on the Boston & Maine R.R. contract. This particular order has been held for several years by interests shipping via Norfolk but not from the Pocahontas or New River fields. It would be a sizable order for any shipper to lose and it will be decidedly interesting to see whether this tonnage stays where it is or whether the order is awarded to interests that ship over the Western Maryland or the Baltimore & Ohio.

Full contract figures are being realized for what Georges Creek reaches this territory. The tonnage continues small, with loading at Baltimore still subject to the claims of foreign bottoms for preference in loading.

Only a hand to mouth business is being done by the shippers of Pennsylvania grades. Inquiry is slightly improved, but not enough to make prices any firmer. The minimum range still obtains, but less coal is on demurrage at the loading piers and fewer sacrifice sales are reported. A fair amount of tonnage is coming to this territory in conjunction with anthracite in barges from Philadelphia.

Water Freights—While coastwise rates are nominally unchanged, the market is very susceptible to the least intimation of any charter demand; 75@80c. is the prevailing rate to Boston from Hampton Roads, but quotations to points other than Boston, Providence, or Portland are rather higher than the usual differential calls for. Bangor charters are ordinarily to be had for 15c. up from the Boston rate, but recent charters have been made at $1@1.10.

Anthracite—The companies appear to be moderately well supplied with orders for the present. Retail demand has started up throughout New England and shipments that were to be withheld are now required as promptly as possible. Some of the more conservative dealers are frankly pursuing the policy of keeping a full stock throughout the fall and winter. While receipts during the summer were somewhat lighter than in 1914 it is predicted now that the fall months will more than make up for any deficit.

Bituminous prices at wholesale are about as follows:

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines*	$0.90@1.40	$1.15@1.65	$1.67@1.77	
Philadelphia*	2.15@2.65	2.40@2.90	2.92@3.02	
New York*	2.45@2.95	2.70@3.20	3.22@3.32	
Baltimore*	....	....	2.85@2.95	
Hampton Roads*	....	....	....	$2.80@2.85
Boston†	....	....	....	3.58@3.78
Providence†	....	....	....	3.50@3.73

* F.o.b. †On cars.

NEW YORK

Better feeling in anthracite circles. Many new orders received. Improvement in line trade. Bituminous situation encouraging. Contract holders taking full quota. Railroads continue to store.

Anthracite—A slightly better feeling exists in the anthracite trade. Dealers are receiving many new orders, some for immediate delivery, and there has been a noticeable improvement.

The announcement from Washington that the Interstate Commerce Commission had extended until Dec. 1, the time for putting into effect the new rates and orders affecting a change in the transporting of hard coal, had a quieting effect on the trade. Wholesalers now feel they can go ahead on a safe basis for at least a few months.

With the passing of Labor Day and the practical ending of the vacation season many householders will return to their winter homes within a short time. This will enable retailers to fill many empty bins. While they have plenty of coal on hand to care for these orders the diminishing of stocks will cause them to place new orders and this will mean an improvement in the general situation.

More improvement has been noticed in the line trade than at tidewater. There has been an increase along Long Island Sound and in New England. The mines worked about four days this week but a better working schedule may be expected shortly.

Demand for the various sizes show little change. Egg and stove are in fair demand but there is a surplus of chestnut. The steam sizes are dull. Pea coal continues plentiful, as is also No. 1 buckwheat. Nos. 2 and 3 buckwheat, of the better grades, are practically out of the market.

Current quotations follow:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$5 05		$5.10	
Egg	5.30	$4.80@5.30	5.35	$4.90@5.35
Stove	5.30	4 80@5.30	5.35	4.90@5.35
Chestnut	5.55	5.00@5.55	5.60	5.10@5.60
Pea	3.50	3.25@3 50	3.55	3.50@3.55
Buckwheat	2.75	2.25@2.75	2.80	2.25@2.80
Rice	2.25	1.75@2.25	2.30	2.00@2.30
Barley	1.75	1.45@1.75	1.80	1.75@1.80

Bituminous—Interest in the bituminous trade is concentrated on the opening of bids for furnishing from 500,000 to 600,000 tons of coal for the Panama R.R. Many dealers take the prices made on this business as a basis for next year's contracts (see contract 1327, p. 446).

While large consumers continue to take better tonnages on their contracts, spot coal demand shows no improvement. There is a well-defined belief that the coming fall and winter will see a shortage of supply and some manufacturers who permitted their stock piles to dwindle are making inquiries. The railroads who are good barometers continue to place large orders for storage purposes. Shippers, as a rule, are sending full quotas on contracts. Fears of a serious car shortage and the prospects of labor trouble in the spring are increasing among the trade.

Prices remain about the same as a week ago. There have been slight changes in quotations but these were not permanent. The gas-coal situation has improved considerably. Exporters report good business with many new inquiries being received.

Current quotations are on the following basis:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.20@3.30	$3.20@3.30	$3.20@3.30	$1.75@1.85
Georges Creek Tyson	2.90@3.00	2.90@3.00	2.90@3.00	1.35@1.45
Clearfield:				
Medium	2.65@2.80	2.55@2.65	....	1.10@1.25
Ordinary	2.55@2.60	2.55@2.60	....	1.00@1.10
Broad Top Mountain	....	....	....	1.10@1.45
Cambria County:				
South Forks	2.90@3.05	....	....	1.35@1.50
Nanty Glo	2.75@2.80	....	....	1.20@1.25
Barnesboro	2.65@2.70	....	....	1.10@1.15
Somerset County:				
Quemahoning	....	2.70@2.85	2.70@2.85	1.20@1.30
Medium	2.65@2.70	2.60@2.65	2.60@2.65	1.10@1.15
Latrobe	2.45@2.55	....	....	.90@1.00
Greensburg	2.75@2.80	....	....	1.10@1.15
Westmoreland	3.15@3.20	....	....	1.35@1.45
West Virginia Fairmont ¾		2.60@2.70	2.60@2.70	.80@ .90
Fairmont mine-run	....	2.45@2.55	2.45@2.55	.75@ .85
Steam	....	2.45@2.50	2.45@2.50	.90@ .95
Western Maryland	....	2.35@2.40	2.35@2.40	.85@ .90

PHILADELPHIA

Anthracite shows fair improvement. Pea coal stronger but chestnut continues weak. Other sizes slightly off circular, but the outlook is more favorable. Bituminous picking up slowly. Short labor and car supply interfering with shipments.

Anthracite—The slight improvement recorded last week continues. All companies report a fair increase in orders, due probably to the recent very cool weather. One of the largest retail companies put on forty extra teams in one day. Of course this was only temporary, but it goes to show that with the first touch of cold weather the people are compelled to order coal on account of very little having been stored so far. Unless all signs fail, September is going to be up to the average or better.

Most of this increased business has gone to the individuals, who still have prices low enough to attract the greater portion of the trade. However, there is no doubt that this condition will change from now on, as the small shippers are practically up to their capacity and when the heavy demand begins the dealers will turn to the large companies. Price cutting by the individuals may be continued long into the fall, even though it should only be from ten to fifteen cents a ton; however, this is all dependent on climatic conditions. It is expected, too, that late in the year any limited price cutting would be of small effect and the dealers will then no doubt be tying themselves up with the largest shippers in order to avoid any risk of depleted stocks and a possibility of paying premiums when the rush comes about.

It has recently come to light that considerable August coal was bought subject to November billing. It was hoped that the market had seen the last of the long-time credits which have been a feature for many months, for they do not create a healthy condition by any means, as some shippers are sure to learn to their sorrow. It is certainly going to be a difficult matter to get the trade back on a 30- or even 60-day basis.

Pea continues to strengthen slightly and the very low prices of the past several months are only history now. The larger companies, who claim not to have sold any lower than $2 have stated to their customers that they cannot promise shipments at this price beyond the present month, and it would not be at all surprising if $2.25 were asked before the close of next month. There appears to be a concerted effort to get pea back to the position where it is felt it should be as compared with the price of prepared coal. Chestnut continues to cause anxiety with scarcely any tonnage moving into the yards of the dealers.

The prices of the leading companies, according to the September circular, to which the state tax of 2½% must be added, are as follows:

	Line	Tide		Line	Tide
Broken	$3.50	$4.75	Pea	$2.50	$3.25
Egg	3.75	5.00	Buckwheat	1.25	2.25
Stove	4.00	5.00	Rice	.85	1.75
Chestnut	4.15	5.25	Barley	.50	1.50

Bituminous—The bituminous trade is beginning to respond to the improved business conditions. There is no rush, but fair orders are being received and a good many of the shippers report full-time operations at the mines. Labor shortage is acting as a slight deterent, and the current week also showed a car shortage in certain of the mining districts, especially on the lines of the B. & O. Shippers are reporting a good tonnage to the lake district.

Export business continues brisk, with inquiries very plentiful and vessel tonnage still short. It has been learned that most of this business is being taken at about ten cents a ton higher than the domestic trade, with the money generally in hand before shipment. The market is quotable as follows:

Georges Creek Big Vein	$1.65@1.75	Fairmont gas, ¾	$1.20@1.30
South Fork Miller Vein	1.50@1.60	Fairmont gas, mine-run	1.05@1.15
Clearfield (ordinary)	1.00@1.20	Fairmont gas, slack	.70@ .80
Somerset (ordinary)	1.00@1.15	Fairmont lump, ordinary	.90@1.00
West Va. Freeport	.85@ .95	Fairmont mine-run	.85@ .90
		Fairmont slack	.60@ .70

BALTIMORE

Steady improvement to the coal trade. Normal fall conditions about in sight.

Prices are stiffening slowly as the tide of demand is wiping out the surplus production of the mines. Very little low-grade coal is now offering below 80 and 85c. Ordinary coals of Pennsylvania are now bringing from 90c. to $1. Slack, selling recently at 45 to 50c., is now commanding from 65 to 75c. The Baltimore Retail Coal Exchange has set the following fall schedule for the trade: Lykens Valley, No. 2, $8.35; No. 3, $8.60 and nut, $8.60. Sunbury, No. 2, $7.60; No. 3, $7.85, and nut, $8.10. Hard, No. 1, $7.10; No. 2, $7.35; No. 3, 7.60; nut, $7.85, and pea, $5.60.

Exports are holding up well. During August a total of 215,796 tons, valued at $624,389 was loaded here for foreign delivery.

HAMPTON ROADS

Export shipments continue heavy. Little free coal available. Dumpings for month of August amount to 1,561,284 tons.

Coal shipments from Tidewater have been heavy to the foreign markets and there has also been a fair movement coastwise and some government takings. The export movement has been the heaviest to Italy although the largest single cargo of the week went to Cristobal, Canal Zone. Coastwise shipments have gone principally to New England ports with some small cargoes South, and have consisted of high volatile, Pocahontas and New River.

The total dumpings over the three railway piers for August reached the enormous figure of 1,561,284 tons. This is just about one thousand tons below the July movement and is somewhat disappointing as it was expected that the total figures would at least reach 1,600,000 tons. Of the total dumpings the Norfolk & Western handled 790,860 tons, the Chesapeake & Ohio Ry. 467,147 and the Virginian Ry. 303,277 tons. The movement via the Virginian and C. & O. both show an increase over July shipments but there is some falling off in the Norfolk & Western dumpings. The Virginian gain over July figures is only small, but the C. &. O. Ry. showed a decided increase and came within a few thousand tons of making a record for that road.

Railroad Tonnages—Dumpings over the local piers for the past several weeks compare as follows:

	Week Ending				
Railroad	Aug. 7	Aug. 14	Aug. 21	Aug. 28	Sept. 4
Norfolk & Western	135,357	171,252	172,546	211,699	232,394
Chesapeake & Ohio	110,861	83,390	129,826	103,472	82,485
Virginian	64,397	63,066	77,136	82,131	....
Totals	310,515	317,708	379,508	397,302	....

Ocean Charters, Clearances and Freights

VESSEL CLEARANCES

The following steamers have cleared from various ports Aug. 27 to Sept. 3:

NORFOLK

Vessel	Destination	Tons
Tatra	Naples	6,636
Carignano	Buenos Aires	3,700
Vesuvio	Genoa	7,100
Nereuse[1]	Gib for orders	6,000
Wimborne[1]	Genoa	8,790
Brighton[2]	Kingston	900
Leonatus[3]	Havana	2,800
Gregory[4]	Para	500
Silvia	Genoa	5,600
Balgray	Dakar	5,300
Ellin[5]	Leghorn	6,993
Carmen[1]	Gib for orders	5,000
Virginia[5]	Bagnoli	5,220
Southwaite[6]	Buenos Aires	4,886
Ulysses	Canal Zone	12,000
Pendleton	Horta, Fayal	711
Genista	Naples	2,793
M. Lawrence	Lisbon	4,100
HERCULES	Gib for Order	6,620
Llanishen	Savona	5,440

NEWPORT NEWS

Vessel	Destination	Tons
Formand	Cardenas	2,045
Kathleen	Montevidoe	4,785
Hans Borge	Havana	2,100
Nolisment	Genoa	7,520
Jata Mendi	Spezia	5,830

NEWPORT NEWS—Continued

Vessel	Destination	Tons
Lolo	Buenos Aires	4,965
Knud II	Port au Spain	2,615
Gantoise		4,520
Trafalgar	Havana	3,200
Southport		5,800

BALTIMORE

Vessel	Destination	Tons
Silverton	Argentina	3,418
Sesostris	Italy	4,848
Titania	Italy	4,589
Georgios	France	4,134
Bendew	Spain	5,655
Gyfarthfa	Brazil	4,199
Hellenio	Sweden	6,200
Constantinos	Argentina	3,689
Pasqualo Lauro	Italy	1,706
Atland	Sweden	6,904
PFimo	Italy	4,300
Patras	Italy	4,508
Veniero	Italy	6,500
St. Theodore	Italy	7,800

[1] Flat Top Fuel Co. [2] Hasler Bros. Inc. [3] New River Coal Co. [4] Chesa. & Ohio C. & C. Co. [5] Pocahontas Fuel Co. [6] Va. Coaling Corp.

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	To	Tons	Rate
E.W. Hinkly	Gyayanilla	558	
A. Manning	Boston	870	.80
R.M. Walls	Calais	516	1.35
Hawkins	Yabucoa		4.00
C.K. Klink	Biddeford		1.10
F.A. Allen	Calais		1.30
J. Bohannon	Savannah		1.30

BALTIMORE

Vessel	To	Tons	Rate
St. Theodore	Genoa	3,175	
Luisa	Valencia	2,345	
Primo	Italy	2,220	
Bendew	Barcelona[1]	2,305	
Atland	Stockholm	2,744	
D.N. Luckenbach	Key West	1,851	
Avona	Sweden		

[1] Or Valencia.

VIRGINIA

Vessel	To	Tons	Rate
Skogstad	Havana	2,357	
Laertis	River Plate	2,380	8.16
Aldersgate	River Plate	2,364	8.16
Gantoise	River Plate	2,508	
Veerhaven	River Plate	2,007	
Doonholn	Italy	2,777	9.96
A. Stathatos	River Plate	1,749	8.16
Roddam	Montevideo[1]	2,055	7.80
Embiricos	Buenos Aires	1,663	7.92
A.I. Davenport	Rio Grande	952	9.00

[1] Or Buenos Aires.

ATLANTIC RANGE

Vessel	To	Tons	Rate
D. Palmer	Portland	2,331	
G.B. Warren	Sewells Point	1,616	
Maritime	San Fran.	3,598	4.25[1]

[1] Sept. $1.20.

OCEAN FREIGHTS

There has been very little change in the freight market during the past week, and although we chartered a number of steamers for export coal they were all at or about rates recently quoted. We would quote freight rates on coal by steamer as follows:

To	Rate	To	Rate
Havana	$2.50@3.00	Bermuda	**$3.00**
Cardenas or Sagua	2.75@3.50	Vera Cruz	3.50@3.75
Cienfuegos	3.25@3.50	Tampico	3.50@3.75
Port au Spain, Trinidad	3.75	Rio	8.04@8.16
St. Lucia	3.50@3.75	Santos*	8.16@8.40
St. Thomas	3.00@3.25	Montevideo	**8.04**
Barbados	**3.75**	Buenos Aires or La Plata†	**8.04@8.16**
Kingston	2.75@3.25	Rosario	**8.40**
Curacao	3.25	West Coast of Italy	9.84@10.08
Santiago	2.75@3.25	Barcelona**	9.12@9.36
Guantanamo	2.75@3.25	Valparaiso or Callao	7.00
Demerara	4.50@5.00	Marseilles	9.36@9.60

Note—Rates noted in **bold face** type are only approximate.

* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British steamers; neutral steamers are more difficult to obtain and the rates are always higher.

W. W. Battie & Co.'s Coal Trade Freight Report.

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge. 24c. per net register ton per day demurrage."

LAKE MARKETS

PITTSBURGH

Heavier Lake movement and demand better in other quarters. Operations increased and now between 60 and 70%. Prices firmly maintained.

There has been a decided increase in the Lake movement and expectations are entertained that from now to the end of the season the movement will be practically normal, though even this will make a low total for the season. The ore trade has livened up in remarkable manner. The August ore movement was by far the best of the season and the prediction is made that shipments from Sept. 1 to the end of the season will be equal to the record for that period.

The iron and steel industry has increased its consumption of coal somewhat and consumption in this direction is probably equal to the best rate ever reached. There has been a slight increase in the requirements of other industries. Railroads are also taking somwhat more coal. Retailers are beginning to stock for the regular fall movement but shipments to retailers are thus far not very heavy.

Mine operations in the Pittsburgh district are between 60 and 70% of capacity, probably nearer the higher figure, and somewhat heavier operations are likely in the next two months.

Prices for free coal are quite firmly maintained as follows: Slack, 50@60c.; nut and slack, 90@95c.; nut, 95c.@$1; mine-run, $1@1.05; ¾-in., $1.10@1.15; 1¼-in., $1.20@1.25, per net ton at mine, Pittsburgh district. On contracts to Apr. 1 the market is firm as follows: Slack, 85@95c.; mine-run, $1.15; ¾-in., $1.25; 1¼-in., $1.35.

BUFFALO

Fairly good reports in bituminous. Tonnage increasing. Prospects good for active fall trade. Dealers eager for better movement. Stir in anthracite should begin soon.

Bituminous—Shippers are somewhat puzzled over the increased demand. They agree that it has increased, but it comes so irregularly that it is hard to estimate. There is at least improvement enough to cut out all the very low-priced coal of the earlier part of the year. Slack is stronger and is now back to its old price of about 35c. lower than Pittsburgh mine-run, where it will no doubt stay till after the Lakes close. The Lake trade, when in active condition, turns out a large amount of slack, on account of the shipping of so much three-quarter, but the Lake trade has been dull lately, so that slack should be strong in December.

There is no further report of coal-car shortage, but it is sure to happen as soon as the crops begin to move. The roads have already withdrawn their gondola cars mostly from the coal trade, as they are primarily intended for carrying iron and steel. Some of the leading Pittsburgh coal companies having made a special fall price for the Buffalo market, which they seldom do, and the following will be the basis till further notice: $2.65 for best Pittsburgh lump, $2.50 for three-quarter, $2.40 for mine-run and $2.05 for slack. Allegheny Valley sizes remain about 25c. below Pittsburgh.

Anthracite—There is a slight stir among the buyers at retail, but the demand is not likely to be at all large for some weeks yet. It requires actual starting of fires to make any impression on most consumers. Reports from beyond Lake Michigan are that buying has begun in a healthy way. Lake shipments of anthracite from this port are mainly dependent on such buying and they have been light. For the week the total was 109,237 tons, for the month of August, 509,935 tons and for the season to September they were 2,380,325 tons. The amount last season to September was 2,728,345 tons. The excess of last season was almost entirely on account of the light shipments last July. It is not likely that the loss will be made up.

Anthracite mines are still running slow and in addition are obliged to stock considerable of their output. It is said that the slow buying is largely on account of the readjustment of freight rates, some idea being that there may be a still further change.

COLUMBUS

A marked improvement is noted in every department of the coal business. Domestic and steam trade both more active. Future prospects are brighter.

The trade is showing a definite improvement in every way. Orders for both steam and domestic sizes are coming in better with the result that prices have stiffened materially. The whole tendency is toward higher levels and the worst of the depression is now believed to be over. There is a more optimistic feeling in coal circles and future prospects are brightening.

Dealers' stocks were not large and when the better demand came these soon dwindled so they were forced to put in orders for large shipments to come forward at once. Comparatively few orders are taken for delivery at a future date. Rural dealers are also experiencing a better demand since the farmers have time to haul their winter's supply. Retail prices are stiff and some small increases have been recorded.

The steam business is more active in every direction. Manufacturing is on a larger scale and fuel reuisitions are gradually increasing. Railroads are also stocking up tonnage to be on the safe side. Steam grades are stronger in price and the tendency is to buy more liberally.

The lake trade is more active as the end of the season approaches. Reports from the Northwest show that the movement off the docks to the interior is larger. Chartering of boats is going on actively and a large tonnage will be moved to the head of the Lakes from this time to the close of navigation. A large percentage of the coal loaded at Ohio Lake ports comes from West Virginia.

Prices in Ohio fields are as follows:

	Hocking	Pomeroy	Eastern Ohio	Kanawha
Re-screened lump.......	$1.50	$1.50		
Inch and a quarter......	1.40	1.40	$1.30	$1.30
Three-quarter inch......	1.25	1.25		1.25
Nut..................	1.15	1.25		1.15
Mine-run...............	1.05	1.10	1.00	1.05
Nut, pea and slack......	.65	.70	.55	.65
Coarse slack...........	.55	.60	.45	.55

Mines have been working at about the following percentages of full capacity:

District	Week Ended Aug. 14	Aug. 21	Aug. 28	Sept. 11	District	Week Ended Aug. 14	Aug. 21	Aug. 28	Sept. 11
Hocking....	25	30	35	45	Cambridge.	30	35	35	40
Jackson....	20	20	20	20	Masillon...	25	30	50	40
Pomeroy ..	40	40	45	50	Eastern O..	30	55	55	60
Crooksville.	30	30	30	35					
					Average..	30	33	34	41

CLEVELAND

Warm weather has somewhat interfered with the retail business. The lake trade will be much heavier by Sept. 15.

The closing down of factories over Labor Day gave the plants two idle days that cut into the demand for coal. The market cleaned up well, however, and prices are the same as they have been for the last two weeks. The receipts over Sunday and Monday were held firmly the few hours offices were open Labor Day.

The retail trade has suffered because of the warmer weather but this is only temporary. Discounts ended on hard coal and coke delivered prior to and paid for on Sept. 1, but not so many people took advantage of these as usually do.

In the Lake trade very little is expected at Lake Erie ports for a week. The mines will hardly get back in full operation before the last of the week and Lake coal will not be forthcoming in quantities until next week. Shipping orders have been received for a large tonnage to be floated, but operators cannot get to this business until about Sept. 15 because of the break in mining operations.

Jobbers are looking for a drop in the prices of fine coals after the middle of the month as the Lakes take practically nothing except three-quarter coal. Most jobbers are buying slack only as they have call for it for this reason.

Quotations to jobbers for shipment are as follows:

	Pocahontas	Youghiogheny	Fairmount	Bergholz	Ohio No. 8
Lump.............	$3.70			$2.30	
Lump, 6-in........				2.30	
Lump, 1¼-in.......				2.10	$2.10@2.15
Lump, ¾-in.......		$2.15@2.20	$2.00	2.00	2.00
Egg..............	3.70			1.95	
Mine run.........	2.70	2.10@2.15	1.90	1.85	1.80@1.85
Slack............		1.55	1.70	1.50	1.50

LOUISVILLE

Improved tone to the market. Buyers in the market for larger tonnages.

The coal market is in much better condition than it has been, and the feeling is generally stronger. Prices have been advancing somewhat, and the buyers are covering their requirements as much as possible on the present price levels, since it is evident that an upward movement is on. Dealers have hesitated to stock up, but recent cool weather, which has stimulated the movement to consumers, has likewise resulted in a better demand from the yard men.

The regular run of Eastern Kentucky coals are selling at $1.60 to $1.75 for block, with egg at $1.25 to $1.30 and nut and slack from 65 to 70c. These prices represent a fair advance as compared with last week, and likewise are significant of a change from a buyer's to a seller's market. Fancy Jellico lump coal is being held around $2 a ton. Western Kentucky coals are also profiting by the improvement.

CINCINNATI

Sluggishness in the domestic market continues. Prices low, and no improvement in sight.

With a firm impression prevailing among retailers, that they can get all the coal they want the domestic market is dull. It is a fact that while dealers stocks are much below normal, they have some coal bought at bargain prices, which is relied on to last them should an unexpected demand develop. Steam consumption is still much below what it should be, also, making the entire market sluggish. The only factor, it seems, which can liven things up is something like a normal fall demand.

COKE

CONNELLSVILLE

Prompt furnace coke low but with limited offerings. Trade trying to develop a price for first-half deliveries. Another byproduct plant. Production slightly increased and shipments slightly decreased.

Sales of prompt furnace coke have continued at $1.60 and there are only very limited offerings at this figure, most operators quoting $1.75. The great question before the coke operators now is the price furnace coke should bring for the first-half of 1916. There have been some tentative inquiries from furnace interests but buyers and sellers are far apart. No bids have been made and it cannot be found that any definite quotations have been put out by operators. With the iron and steel trade so prosperous operators think they should obtain say $2.50 for the first-half, but it is practically out of the question to expect to obtain such a price when prompt coke is $1.60. Sliding scales, based on basic pig iron at valley furnaces, are being discussed. For the balance of this year $2 is mentioned in a general way but negotiation might develop a lower figure.

Andrews & Hitchcock have put in a second blast furnace at Hubbard, Ohio, and prospects are that two or three furnaces in the Shenango Valley will blow in shortly. The La Belle Iron Works, Steubenville, Ohio, which has contemplated building a byproduct coke plant for some time, has let a contract for 96 byproduct ovens, to have an output of about 1000 tons of coke daily. The market is quotable as follows: Prompt furnace, $1.60@1.75; September furnace, $1.75; furnace to Jan. 1, $2; prompt foundry, $2.25@2.60; contract foundry, $2.30@2.60, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Aug. 28 at 391,310 tons, an increase of 8,704 tons, and shipments at 388,107 tons, a decrease of 5,521 tons.

Buffalo—There is a good movement, prices holding firm. It does not appear likely that an advance will take place right away, as efforts to secure one do not succeed. Still the iron trade is very active here. Late sales have about taken the local output for the entire year and pig iron has lately advanced. The Buffalo prices of coke remain firm, on the basis of $4.25 for best 72-hr. Connellsville foundry and $3.30 for stock coke.

Chicago—Shippers of furnace and foundry coke are still enjoying a brisk business, and a further advance in prices is expected on spot deliveries very shortly. Byproduct sizes have been quiet during the past week, and gas house coke has not been so strong. Quotations are as follows: Byproduct foundry, $4.90@5.10; byproduct domestic, $4.65@4.75; Connellsville, $4.75@4.90; Wise County, $4.75@5; gas coke, $3.75@3.90.

MIDDLE WESTERN

GENERAL REVIEW

Strengthening seen in all directions. Demand for domestic grades stiffened. Screenings steady in the face of increased production. Anthracite orders in better volume.

Expansion of business and renewed activity has ruled during the closing days of August. There is a genuine feeling that the market is on an upward trend, and at a rapid pace at that. A great many operators in Indiana and Illinois claim that they have enough domestic orders to absorb production of coarse sized coals for the next three or four weeks. Inquiries are abundant; but little cheap coal is offered; the attitude towards contracting at low prices has changed; car shortages are reported more frequent, and some announcements are being made of delivery of cars to mines on a percentage allotment basis.

All domestic sizes have materially stiffened, and shippers are feeling encouraged over the immediate outlook. In some quarters it is reported that the higher prices quoted since the first of the month have slowed up orders the last few days somewhat, but this is considered only temporary in view of the possibilities of car and labor shortages in the near future, and renewed buying of a vigorous kind is expected by the middle of the month.

Industrial plants with heavy output are showing a disposition to increase their stocks. In the case of steel and allied industries, coal consumption is now exceeding the normal amount, and with the evident desire on the part of Western railroads to put coal in storage for future emergencies, the coal operator believes that better times are at hand.

CHICAGO

Mines working better and orders more plentiful. Smokeless more active. Advance in anthracite freights causes no increase in prices as yet.

Mines in southern Illinois are running almost full time, and those in the central district are doing better. It is said some of the Franklin County mines are now three weeks and more behind their orders on certain coarse sizes. Franklin and Williamson County screenings show a tendency to decline due to increased production of major sizes. Considerable fine coal tonnage is reported sold around 55c. Increased orders have been received for Harrisburg steam lump.

Conditions in the Springfield district are showing a steady improvement. The shippers report considerable increased activity with many inquiries, and a fair volume of orders. Springfield domestic lump advanced to $1.65 on Sept. 1. Screenings have gone forward steadily at prices ranging from 60 to 65c.

Orders for Indiana domestic lump have rapidly increased. Sullivan County mines have a surplus of egg and nut sizes which are being sold at from 10 to 15c. per ton under list. Clinton Third and Fifth Vein steam lump shipments have been very quiet. The Indiana retailers are coming into the market rapidly for local domestic coals for stocking purposes, and the difficulty now is to market the small sizes.

Smokeless contracts have been closed recently which had been hanging fire for a number of weeks past, and prior to Sept. 1 there was a brisk flow of orders. Few orders have been booked by smokeless operators for immediate delivery since Aug. 1. Cancellations and suspensions have been frequent for orders given in July with the expectation that the market would stiffen early in August.

Some of the splint operators have notified their customers that Sept. 1 their prices will be advanced, and current quotations will not be protected. This has caused some quickening in orders early this week.

A revival has occurred in Hocking domestic trade. Some of the operators are starting off September with strict adherence to the $1.50 price for 3-in. lump, $1.75 for 6-in. lump, and 1¼-in. lump at $1.35. Strength is exhibited in the small sizes, and fine coal is bringing around 55c. to 65c. Generally prices for Hocking coals are much better maintained than they have been for many months past.

All Kentucky coals are still dull.

Anthracite shows improvement, and so far Chicago representatives have not advised the trade of any advances to equalize the recent increase in freight charges on all-rail coal to Chicago. It is said that dealers are sending in more orders the last few days, which causes some to think that September will make a very good record for shipments.

Quotations in the Chicago market are as follows:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump......	$1.60@1.75	$1.50@1.60	$1.45@1.60	$1.35@1.50	$1.45@1.60
Steam lump	....	1.25@1.35	1.15@1 30	1.15@1.25	....
2½ and 3-in. lump	....	....	1.40@1.50	1.15@1.25	1.30@1.35
1¼-in. lump.	....	....	1.30@1 35	1.15@1.20	....
Egg	1.45@1.75	1.35@1.50	1.15@1.25	1.05@1.15	1.15@1.25
Nut	1.45@1.75	1.10@1.25	1.00@1.10	.95@1.05	1.00@1.10
No.1washed	1.60@1.75	....	1.40@1.50	....	....
No.2washed	1.35@1.50	....	1.35@1.40	....	....
No. 1 nut . .	1.60@1.75	....	....	....	....
No. 2 nut .	1.25@1.40	....	....	....	....
Mine-run...	1.20@1.25	1.00@1.10	.85@ .95	.90@1.00	.85@1.05
Screenings..	.60@ .65	.65@ .75	.65@ .75	.55@ .65	.75@ .80

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump......	$1.50@1.75	$1.35@2.25	$2 00@2.25	$1.75@2.00	$1.40@1.60
1¼-in. lump.	1.20@1.35	....	....	....	1.25@1.35
Egg	1.35@1.60	1.25@1.85	1.90@2.25	1.65@2.00	1.35@1.50
Nut.......	....	1.15@1.50	1.75	1.25@1.40	....
No. 1 nut..	1.50@1.60	....	1.40	....	....
No. 2 nut..	1.25@1.40	....	....	....	....
Mine-run...	1.00@1.10	....	1.25@1.40	1.00@1.25	1.00@1.15
Screenings..	.55@ .65	.50@ .70	....	....	.55@ .65

West Virginia splint 4-in. lump, $1.25@1.35; 1¼-in. lump, $1.15@1.20.

ST. LOUIS

Prices advanced though some low-priced contracts are carrying over. Demand strong on domestic grades.

With the first of the month at hand Franklin County domestic lump prices have advanced considerable. Many mines still have orders at lower prices, which were taken last month. The filling of these orders have been delayed on account of the shortage of cars produced by flood conditions in August.

The demand is strong on all grades of standard domestic sizes, while screenings are just a little weaker, with a steady demand. The better grades of DuQuoin coal are in strong demand at from $1.50 to $1.65 per ton mine for domestic 6-in. lump and egg, while screenings are moving freely at 55@60c.

Quotations are as follows:

	Big Muddy	Frank Co.	Carterville	DuQuoin
8-in. lump	$2.25			
4-in. lump	2.10			
2½-in. lump	2.00			
6-in. lump		$1.65@$1.75	$1.50@$1.60	$1.50
3x6-in. egg		1.65@ 1.75	1.50@ 1.60	1.50
No. 1 nut		1.60@ 1.75		1.25
No. 2 nut		1.50		
No. 1 washed			1.50	
No. 2 washed			1.25	
No. 3 washed			1.20	
No. 4 washed			1.15	
No. 5 washed			.70	
Screenings	1.00		.50@ .60	.55

Prices quoted above are f.o.b. mine. The rates from mines to St. Louis are: Big Muddy, 70c., Franklin County and Williamson County, 72½c., DuQuoin, 62½c. East St. Louis rates are 35½c. per ton less.

INDIANAPOLIS

Mines have begun to increase output of domestic lump. Buyers looking for lower prices for slack but operators slow to accept lower figures.

The arrival of September put many Indiana mines to making domestic lump, preparatory to the first of the heavy buying by private consumers for the fall and winter season. An attempt was made, it is said, by some operators to start the season off at prices showing some increase over the summer schedule but it was found that other operators were content to sell at the old scale and it is evident that there can scarcely be an advance maintained until cold weather appears.

It is difficult to learn whether any of the operators have accepted the low bids of the buyers of slack but it is known that some of the mines are not disposed to sell at below the cost of production as was done last winter. There is practically no change in the railroad or industrial demand. The movement of domestic grades to schools, public buildings, apartments, etc., is taking on some activity.

PORTLAND

Local prices expected to advance shortly in conformity with the increase announced at mines in Utah and Wyoming. Fair volume of business looked for here the coming fall.

The coal business is quiet, but the outlook is for a fair volume of business in the fall as soon as cooler weather sets in. Coal men find buyers showing little disposition to put supplies in storage and hence they expect that when the cooler weather sets in orders will come briskly.

The mines in Utah and Wyoming announced an advance to $2.75 per ton on lump at the mines, a short time ago, but the retailers here have not yet added the increase. The freight to Portland from the mines in Utah is $4.50 per ton and from Wyoming 25c. less, leaving a margin of about $3 per ton for handling. Washington coal, from the Centralia district, is selling at $6 per ton, retail.

FOREIGN MARKETS

Aug. 27—There is a pronounced absence of business on the coal market and the general demand is unimproved. Quotations are nominally as follows:

Best Welsh steam	Nominal	Best Monmouthshires	$5.76@6.00
Best seconds	Nominal	Seconds	5.28@5.52
Seconds	$5.76@6.00	Best Cardiff smalls	4.56@4.80
Best dry coals	5.76@6.00	Cargo smalls	2.88@3.36

The prices for Cardiff Coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of Wharfage.

Freights—Chartering is on a fairly active scale but tonnage is still scarce. Rates are approximately as follows:

Gibraltar	$3.96	Naples	$6.96	St. Vincent	$4.32
Marseilles	6.76	Alexandria	7.44	Rio de Janeiro	5.04
Algiers	5.22	Port Said	7.20	Monte Video	4.80
Genoa	6.96	Las Palmas	4.08	Buenos Aires	5.04

CONTRACT NOTES

Netherlands—There is great demand and agitation for coal. The Netherlands Oversea Trust will now issue licenses for American coal.

Louisville, Ky.—The Alfred Shuck Co. consume about 450 tons of nut and slack coal per year. Deliveries are made by railroad at the rate of 40 tons per month, and they have a storage capacity of 100 tons.

Philadelphia, Penn.—Smedley Bros. Co. at this place consume about 300 tons of bituminous coal per annum. Deliveries are made by railroad and they have a storage capacity of 100 tons. Address Secy. R. L. Hilles, Smedley Bros. Co., Frankford, Philadelphia, Penn.

Paraguay—A dealer in builders supplies in Paraguay informs an American consular officer that he desires to buy foundry and furnace coke. He has been paying $13.51 per ton f.o.b. Buenos Aires, and $20.26 per ton c.i.f. destination. He buys about 300 tons per annum. Correspondence should be in Spanish.

Cincinnati, Ohio—The King Machine Tool Co. uses approximately 750 tons of 1¼-in. screened gas coal. Deliveries are made by railroad. They have a storage capacity of 400 tons and deliveries are made only twice a year. They do not contract. Address Pur. Agt. E. A. Muller, King Machine Tool Co., Clifton Ave., Cincinnati, Ohio.

Louisville, Ky.—The Belknap Hardware & Manufacturing Co. at this place consume about 8000 tons of pea and slack coal per annum. Deliveries are made by railroad at the rate of 100 to 200 tons per week, and they have a storage capacity of 200 tons. Address Pur. Agt. J. N. Hall, Belknap Hardware & Manufacturing Co., Louisville, Ky.

Alliance, Ohio—The contract for furnishing the local schools with coal during the ensuing year has been awarded to **Wright & Zehner** on Hocking ¾-in. at $2.15. Other bids were J. H. Miller & Son, Alliance, Pittsburgh No. 8 lump at $2.25; E. M. Lincke, Alliance, Bergholz ¾-in. coal at $2.15; I. G. Tolerton & Son, for Pittsburgh No. 8. ¾ in. at $2.30.

Madison, Wis.—Contract of the Northern Electric Works of the General Electric Co. at Madison, Wis., for 1200 tons of screenings annually, and for 1500 tons of screenings annually consumed by the Edison Lamp Works of the General Electric Co. at Fort Wayne, Ind., has been awarded to the **Consolidated Indiana Coal Co.** on Argyle, W. Va., screenings, at a price of 75c. per ton f.o.b. mines. Address Purch. Agt. Geo. F. Hinman, General Electric Co., Schenectady, N. Y.

Russia—For small parcels, not contraband, Tornea-Bergen is the best route for exports from Russia; for large consignments, Archangel-New York. Fourteen days is the time for the regular service. The steamers of the Russian American Line sail every 11 days. Train connections in Russia are uncertain.

Oklahoma City, Okla.—The coal contracts for the Oklahoma state institutions have been let as follows: State University, Norman, 500 tons mine-run, at $3.14, to **M. B. Schofield & Co.**; School for the Deaf, Sulphur, 250 tons, mine-run, $2.25, **McAlester Fuel Co.**; Hospital for Insane, Norman, 550 tons, mine-run, $3.10, **National Fuel Co.**, and 950 tons, commercial lump, $3.90, **McAlester Fuel Co.**; School of Mines, Wilburton, 800 tons, mine-run, $2.25, **S. J. Katigan**; Colored Agricultural and Normal University, Langston, delivery to be made at Coyle, 800 tons, mine-run, $3.10, **McAlester Fuel Co.**; Institute for Feeble Minded, Enid, 500 tons, mine-run, $2.89, **M. B. Schofield**; Deaf, Blind and Orphan Asylum, Taft, 250 tons, mine-run, $2.40, **M. B. Schofield**; Girls' College, Chickasha, 120 tons, mine-run, and 80 tons nut, $3.40, **McAlester Fuel Co.**; East Central State Normal, Ada, 150 tons, mine-run, $2.57, **Fidelity Fuel Co.**; Northeastern State Normal, Tahlequah, 250 tons, mine-run, $3.30, **McAlester Fuel Co.**; Southwestern State Normal School, Weatherford, 508 tons, mine-run, $3.40, **Fidelity Fuel Co.**; Northwestern State Normal School, Alva, 250 tons, mine-run, $3.34, **M. B. Schofield**; Southeastern State Normal School, Durant, 250 tons, mine-run, $2.66, **McAlester Fuel Co.**; University Preparatory School, Tonkawa, 250 tons, mine-run, $3.09, **M. B. Schofield**; Eastern Oklahoma Hospital for Insane, Vinita, 1500 tons, mine-run, $2.75; **Catale Coal Co.**; Oklahoma State Home, Pryor, 120 tons, mine-run, $2.48, **M. B. Schofield**; Confederate State Home, Ardmore, 250 tons, mine-run, $3.30, **W. E. Beatty**; State Training School, Pauls Valley, 250 tons, mine-run, $3.05, **J. W. Hinton**, Dewar; State Hospital for Insane, Fort Supply, 2500 tons, mine-run, a carload trial order to be submitted by McAlester Fuel Co. at $4.36, M. B. Schofield at $3.59, J. W. Hinton at $3.95 and Fidelity Fuel Co. at $4.38.

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

For the official advertisements of bids wanted see the Contracts-to-Be-Let Section on Page 16.

✚Indicates contracts regarding which official information has been received.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

1044—Kansas City, Mo.—The Sewell Paint & Glass Co. will continue buying in the open market on this contract (p. 116), but are still looking for a favorable opportunity to cover their requirements. Address Purchasing Agent, The Sewell Paint & Glass Co., Kansas City, Mo.

1180—Columbia, Mo.—Bids were received on this contract (p. 244), which provided for furnishing the local Water and Light Department with approximately 8,000 tons of washed Nos. 3, 4 and 5 slack coal until 7:30 p.m., Sept .7. The contract becomes effective Sept. 12, and expires Sept. 1 of next year. Certified checks for $500 were required with each bid. Address City Clk. John S. Bicknell, Columbia, Mo.

1263—New Orleans, La.—It is understood that the Crescent City Stock Yards & Slaughter House Co. have already concluded arrangements for their coal on this contract (p. 324). Address Pur. Agt., Crescent City Stock Yards & Slaughter House Co., New Orleans, La.

1326—Dalton, Ohio—Bids have been received on this contract (p. 367), which provides for furnishing the fuel requirements for the Board of Education of Sugarcreek Township (p. 367), from John Caldwell, at $3.10 per ton, and E. P. Gerber, $3.25. These are the minimum figures, the prices going upward according to the length of the haul. Address Clk. Clayton L. Arnolud, Bd. of County Comrs., Dalton, Ohio.

1327—New York, N. Y.—Bids on this contract (p. 367), which provides for furnishing all or any part of the Panama R.R. Co.'s fuel requirements, estimated at from 500,000 to 600,000 tons of the best quality, semi-bituminous mine-run coal, were received, as follows:

Bidder	Tonnage	Price	Name	Delivery Point
J. W. Weaver & Co.	500,000	$2.60	"B" or "Miller Vein"	Philadelphia
B. Nicoll & Co.	500,000	2.50	"Belmont"	Newport News
B. Nicoll & Co.	50,000	2.60	"Cambria Smokeless"	Philadelphia
		2.53	"Cambria Smokeless"	Baltimore
New River Coal Co.	100,000	2.85	"New River Steam"	Sewalls Point
Corona Coal & Iron Co.	100,000	3.85	"Corona"	Mobile, Ala.
Archibald McNeil & Sons Co.	100,000	2.89	"New River"	Newport News
Central Coal & Coke Co.	200,000	4.25	"Arkansas Semi-Anthracite"	Port Arthur, Tex
W. C. Atwater	500,000[1]			
	300,000	2.60	"W.C.A. Pocahontas Semi-Bitu. Steam"	Norfolk
	300,000	2.64		Lambert's Pt.
Crozer-Pocahontas Co.	100,000	2.60	"Pocahontas" or "No. 3 Vein"	Lambert's Pt.
C. G. Blake Co.	120,000	2.75	"Blake New River Smokeless"	Hampton Roads.
Willard Brothers	100,000[2]	2.84	"New River"	Newport News or Lambert's Pt.
Castner, Curran & Bullitt	600,000	2.90	"C.C.B. Pocahontas" "C.C.B. New River"	Hampton Roads
Chesapeake & Ohio C & C Co.	180,000	2.74	"Admiralty New River Smokeless"	Sewalls Pt. or Newport News
Chesapeake & Ohio C & C Co.	225,000	[3]2.72	"Admiralty New River Smokeless"	Sewalls Pt. or Newport News
Chesapeake & Ohio C & C Co.		[4]2.79	"Admiralty New River Smokeless"	Sewalls Pt. or Newport News
Pocahontas Fuel Co.	600,000	2.85	"Pocahontas" or "New River"	Hampton Roads.

[1] to 600,000 tons. [2] Not more than 10,000 tons a month. [3] 15,000 tons per month. [4] Chesapeake & Ohio Coal & Coke Co. in their second bid of 225,000 tons offered to furnish 15,000 tons per month from Sept. 15, 1915 to Apr. 15, 1916, at $2.72 per to, and 24,000 tons per month from Apr. 15, 1916 to Sept. 15, 1916, at $2.79 per ton.

Address Asst. Pur. Agt. R. E. Rutherford, Panama R.R. Co., 24 State St., New York, N. Y.

New Business

✚**1365—Pittston, Penn.**—Bids will be received by the School Board until 8:15 p.m., Sept. 14, for furnishing and delivering fresh-mined coal for the school term of 1915-1916. Bids to be submitted on all sizes and certified check for $100 payable to the School Board for faithful performance of contract to be furnished. Address Secy. James A. Joyce, Bd. of School Dirs., Pittston, Penn.

1366—Chisholm, Minn.—Bids were received until 8:30 p.m., Sept. 8, for furnishing the Independent School District No. 40 with approximately 2,000 tons of Pocahontas mine-run coal, to be delivered in carload lots at the High and Lincoln School, 225 tons of Youghiogheny screened lump steam coal to be delivered in bins in carload lots at Myers, Shenango and Monroe schools, and some additional small tonnages. A certified check for 5% of the total amount of the bids must accompany all proposals. Address Clk. M. Tripp, Independent School Dist., Chisholm, Minn.

1367—Springfield, Mo.—The County Government will soon advertise for bids to furnish the court house, county jail and almshouse with coal during the ensuing year. About 50 cars will be required. The present contract has been held by the Merchants' Ice & Fuel Co. Address County Clk. John L. Likens, Springfield, Mo.

1368—New Orleans, La.—The St. Charles Hotel, at this place, is requesting bids on their coal requirements for the period from Oct. 1 of the current year, to June 30, of next year. About 3000 tons will be required. The coal will be bought on a heat unit basis. Address Secy. Treas. S. A. Trufant, St. Charles Hotel, New Orleans, La.

1369✚West Point, Neb.—Cuming County will receive bids until noon, Sept. 14, for furnishing 50 tons of Hocking Valley dock screened lump coal. Address County Clk. R. Brazda. West Point, Neb.

1370—Newark, N. J.—The State Board of Education will receive bids until noon, Sept. 11, for furnishing 250 gross tons of pea coal for the State Normal School at Newark. Deliveries are to be made as required during the period beginning Sept. 12 and ending Feb. 12 of next year. Address Pres. Joseph S. Frelinghuysen, Dept. of Public Instruction, State House, Trenton, N. J.

1371—New Orleans, La.—The Dixie Brewing Co., at this place, is said to be in the market for its annual contract which will be placed some time during the current month. They consume about 3000 tons of coal a year. Address Pres. Val Mertz, Dixie Brewing Co., New Orleans, La.

1372—Latrobe, Penn.—The School Board of Derry Borough will receive bids until 7 p.m., Sept. 13, for furnishing and delivering Jamison No. 1 grade mine-run coal to the three school buildings of the Borough. Address Pres. J. D. Neely, School Bd. of Derry Borough District, Latrobe, Penn.

1373—Chapel Hill, N. C.—The Blanche Hosiery Mills Co. at this place usually contract some time during September for their annual requirements of coal involving approximately 200 tons of Pocahontas mine-run. They have a storage capacity of 50 tons and deliveries are made by railroad. Address Purchasing Agent, The Blanche Hosiery Mills Co., Chapel Hill, N. C.

1374—Erie, Penn.—Sealed bids will be received for furnishing the Soldiers and Sailors Home with coal during the six months beginning Oct. 1 of the current year and ending Mar. 31 of next year. All proposals must be on forms prescribed, which may be obtained on application. For notice of the contract covering this business for the six months' period beginning Apr. 1 of this year, see "Coal Age," Vol. 7, p. 447. Address Col. John P. Nicholson, Flanders Bldg., 15th and Walnut St., Philadelphia, Penn.

1375—Newton, Iowa—The Newton Lodge No. 1270 B. P. O. E. will receive sealed bids for furnishing the local Post Office Building with coal during the period beginning Oct. 1 of the current year end ending July 1 next year. Bids are requested on mine-run, steam, and lump coal, and should include cost of delivery in the bins at the building. Address Secy. Lee Brown, Newton Lodge No. 1270, B. P. O. E., Newton, Iowa.

+1376—Ankeny, Iowa—The Ankeny Independent School District will receive bids until Sept. 15, for furnishing and delivering coal to the local school building as may be required during the ensuing year. Address Pres. G. E. Goughnour, Independent School Dist., Ankeny, Iowa.

1377—Louisville, Ky.—The coal contract for Levy Bros. at this place, involving about 50 tons of nut and slack coal per month, expires Sept. 28. Delivery is made by wagon. Address Fred C. Levy, Levy Bros., Third and Market St., Louisville, Ky.

+1378—Beaver Falls, Penn.—The Chippewa Township School Board will receive bids for furnishing 175 bu. of coal to be delivered at the four school houses in the township. Address Secy. J. R. Gormley, Chippewa School Bd., Beaver Falls, Penn.

1379—Wheeling, W. Va.—The Board of Education at this place usually contracts some time in October for their annual requirements of coal. The amount involved and price at which the business was done in the past few years was as follows: In 1909, 28,429 bu., at 7½c.; 1910, 34,597, 7⅓c.; 1911, 41,744, 7⅓c.; 1912, 34,097, 9½c. The call for bids is advertised. Address Clk. Frank Stanton, Bd. of Edu., Wheeling, W. Va.

+1380—New Sharon, Iowa—The Independent School District will receive bids until Sept. 13, for furnishing coal as may be required at the local school building during the ensuing year. Address Secy. J. B. Heitsman, New Sharon Independent School Dist., New Sharon, Iowa.

+1381—Chicago Junction, Ohio—The Board of Public Affairs at this place usually contracts about Oct. 1 for their annual requirements of coal involving approximately 2500 tons. The contract last year was let at $2.20 f.o.b. the plant for Pittsburgh No. 8, ¾-in. and Fairmont mine-run. Business is done on competitive bids. Address Clk. E. K. McMorris, Bd. of Pub. Affairs, Chicago Junction, Ohio.

+1382—Birmingham, Ala.—The Municipal Water & Light Department at this place usually contracts about Oct. 1 for their annual requirements of coal. On the current contract 1920 tons of mine-run coal is being used which was bought at $1.20 at the mine. Business is done on competitive bids. Address Supt. W. H. Abernathy, Municipal Water and Light Plant, Birmingham, Ala.

+1383—Miller, S. D.—The Hand County Board of Commissioners received sealed bids until noon, Sept. 7, for furnishing anthracite nut and Hocking Valley coal to be delivered in any part of Miller City as may be required. Address County Audr. D. A. Lewis, Bd. of County Comrs., Hand County, S. D.

1384—Louisville, Ky.—The Atherton Realty Co. will contract some time in October for its annual supply of coal, involving three or four tons per day. It uses nut and slack coal. Address Supt. Sanders, Atherton Realty Co., Atherton Bldg., Louisville, Ky.

+1385—Corydon, Iowa—The County Board of Supervisors will receive bids until 10 a.m., Sept. 13, for furnishing coal required at the Court House and County Home during the coming season. Lump coal is required; that for the court house is to be delivered in the basement and that for the County Home should be on track at Corydon, Iowa. Address County Audr. George S. Moore, Corydon, Iowa.

+1386—Mott, N. D.—The County Government received sealed bids until 2 p.m., Sept. 8, for furnishing 100 tons of lignite coal. The successful bidder will be required to furnish a bond for $200. Address County Audr. E. C. Roberts, Hettinger County, Mott, N. D.

+1387—Missoula, Mont.—The City Government will receive bids until 10 a.m., Sept. 15, for furnishing approximately 75 tons of coal. Address City Clk. L. E. Harris, Missoula, Mont.

+1388—Carlisle, Penn.—The Carlisle School District will receive bids for furnishing approximately 200 tons of bituminous coal to be delivered as required. Bids are to include cost of delivery to the various buildings. Address Chn. C. M. Liggett, Property Com., Carlisle, Penn.

+1389—Yankton, S. D.—The Board of County Commissioners received bids until 2 p.m., Sept. 7, for furnishing the best grade of screened Hocking Valley coal for use at the Court House and Jail during the period beginning with September of this year, up to and including April of next year. Address County Audr. W. O. Nelson, Yankton, S. D.

+1390—Trenton, N. J.—The New Jersey State Hospital will receive bids until Sept. 15 for furnishing coal as may be required during the ensuing year. Address Warden Daniel T. Atchley, New Jersey State Hospital, Trenton, N. J.

1391—Knoxville City, Iowa—The Independent School District of this place will receive bids until 7 p.m., Sept. 13, or furnishing a good grade of merchantable lump coal to be delivered at the three or more school buildings of Knoxville in such quantites that a reasonable supply will be on hand all the time. The successful bidder will be required to furnish a bond for $500. Address Secy. T. G. Gilson, Independent Dist., Knoxville, Iowa.

+1392—Anamosa, Iowa—Sealed bids will be received by Jones County for furnishing approximately 150 tons of Christopher 6-in. lump coal, to be delivered in October and November. Bids will also be received on 30 tons of anthracite range coal. Address County Audr. E. J. Hines, Anamosa, Iowa.

1393—Troy, Ohio—The Miami County Board of Commissioners will receive bids until 2 p.m., Sept. 15, for furnishing approximately 500 tons of 1½-in. screened lump coal, to be delivered at the boiler house on Water St., as may be required, during the period ending Aug. 1 of next year. Bids will also be received for furnishing 500 tons of 1-in. screened lump coal, to be delivered in carload lots at the County Infirmary during the same period. All bidders must furnish a certified check for $50. Address County Audr. M. T. Staley, Miami County, Troy, Ohio.

1394—New Castle, Penn.—The County Government will receive bids until noon, Sept. 16, for furnishing coal as may be required at the Court House and County Jail during the coming season. Bids are requested on Pittsburgh 1¼-in. screened coal and deliveries are to be in such quantities as required. Address Clk. James R. Lamoree, County Comr., New Castle, Penn.

+1395—Pinckneyville, Ill.—The Board of Education, District No. 50, will receive bids until Sept. 10 for furnishing coal as may be required during the school year ending June 30, 1916. The successful bidder will be required to furnish a bond for $200. Address Clk. C. H. Roe, Jr., Pinckneyville, Ill.

1396—Beckley, W. Va.—The Board of Education at this place will receive bids for furnishing coal as may be required at the various schoolhouses during the ensuing year. Address Secy. M. R. Jennings, Bd. of Edu., Beckley, W. Va.

1397—Pomeroy, Ohio—The Salisbury Township Board of Education will receive bids until Sept. 11 for furnishing and delivering a good grade of clean lump coal to the various school districts, as follows: Subdistrict No. 1, Silver Run, 300 bu.; No. 2, Long Hollow, 150 bu.; No. 3, Bradbury, 450 bu.; No. 4, Laurel Cliff, 300 bu.; No. 5, Rock Springs, 300 bu.; No. 6, Bull Run, 150 bu.; No. 7 Hiland, 150 bu.; No. 8 Coal Valley, 150 bu.; No. 9 Jacobs, 150 bu.; No. 10 Midway, 150 bu.; No. 11, 150 bu.; No. 12, Bailey Run, 150 bu.; No. 13, Rose Hill, 300 bu.; No. 14, Long Hollow, 150 bu. Prices are to include cost of delivery, which is to be completed before Oct. 15. Address Clk. Leo J. Byrne, Salisbury Township Bd. of Edu., Pomeroy, Ohio.

+1398—Vandergrift, Penn.—The school district of Vandergrift received bids until Sept. 8 for furnishing carload lots of Pittsburgh nut coal or No. 1 coal from the local banks. Address Secy. W. A. Wiggins, Vandergrift School Dist., Vandergrift, Penn.

+1399—Lewiston, Idaho—The County Government will receive bids until 9 a.m., Sept. 13, for furnishing 40 tons of furnace coal, to be delivered at the Court House. Address Clk. R. N. Wright, Lewiston, Idaho.

+1400—Wellsburg, W. Va.—The Wellsburg Board of Education will receive bids until Sept. 14 for furnishing and delivering coal to the various school buildings during the ensuing year, as may be required. Address Secy. J. A. Gist, Bd. of Edu., Wellsburg, W. Va.

1401—New Orleans, La.—The Robert Werk Pressing Cloth Co. is in the market for its annual requirements of coal, aggregating about 300 tons of lump or mine-run. The coal is to be delivered direct to the company's factory. Address Robert Werk, the Robert Werk Co., 2519 St. Philip St., New Orleans, La.

1402—New Lexington, Ohio—The Board of Education at this place will receive bids until noon, Sept. 18, for furnishing from 120 to 160 tons of lump and mine-run coal to be delivered to the local school building during the coming school year. The successful bidder will be required to furnish a bond for $300. Address Clk. J. H. Cookson, Bd. of Edu., New Lexington, Ohio.

1403—Omaha, Neb.—The Board of Education at this place will receive bids until 2 p.m., Sept. 15, for furnishing approximately 8,200 tons of bituminous and 350 tons of anthracite range coal to be delivered to the various school buildings. Bids will also be received for delivery according to districts as provided in the specifications and f.o.b. track. In bituminous the specifications call for lump, nut, mill and slack coal. The specifications are made more elastic this year in order to enable dealers in different parts of the city to benefit by their proximity to the various schools, to bid. Address Secy. W. T. Bourke, fifth floor, City Hall, Omaha, Neb.

1404—New Orleans, La.—The New Orleans Cotton Exchange is said to be in the market for their winter's supply of coal. Address Chn. Chaffee, New Orleans Cotton Exchange, New Orleans, La.

1405—Baltimore, Md.—The Shawinnigan Electro Products Co. at this place are now in the market for the fuel supply for a new plant they are completing and expect to put in operation about Nov. 1. Approximately 6,000 tons of anthracite steam sizes will be required. Address Purchasing Agent, The Shawinigan Electro Products Co., Baltimore, Md.

1406—Ogden, Iowa—The Independent School District of this place received bids until 5 p.m., Sept. 10, for furnishing the best grade of lump and mine-run coal to be delivered in car load lots at the school buildings during the coming school year. Address Clerk, Bd. of Edu., Independent School Dist., Ogden, Iowa.

1407—Augusta, Ga.—The City Government received bids until 5 p.m., Sept. 7, for furnishing the coal required during the year beginning Oct. 1. Bids were requested on Jelico coal in half-ton, ton and carload lots, on blacksmith coal in half-ton and ton lots, on nut, egg and furnace coal in half-ton and ton lots and on carload lots of steam coal. Address Clk. Wm. Lyon Martin, Finance Com., City Council, Augusta, Ga.

1408—Antigo, Wis.—The Board of Education at this place received bids until Sept. 8 for furnishing and delivering 200 tons of Miller Creek and 200 tons of white ash coal as may be required during the ensuing year. Address Clk. A. F. Zimmerman, Bd. of Edu., Antigo, Wis.

1409—Philadelphia, Penn.—The Philadelphia County Prison will receive bids until Sept. 14 for furnishing 600 tons of anthracite buckwheat coal to be delivered during October, November and December. Address Philadelphia County Prison, 10th and Reed Sts., Philadelphia, Penn.

1410—Minneapolis, Minn.—The Board of Charities and Corrections will receive bids until 2 p.m., Sept. 14, for furnishing approximately 5,000 tons of Youghiogheny or other bituminous screenings for use at the Minneapolis City Hospital during the period ending Apr. 1. All bids must be accompanied by a certified check for 5% of the amount of the bids. Specifications are on file. Address Secy. Richard Tattersfield, Bd. of Charities and Corrections, City Hospital, Minneapolis, Minn.

1411—Youngstown, Ohio—The Public Service Department will receive bids until noon, Sept. 14, for furnishing approximately 800 tons of coal to be delivered in the basement of the new city hall. Specifications and blank forms may be had on application. All bids must be accompanied by a certified check for $200. Address Clk. H. C. Fox, Pub. Service, Youngstown, Ohio.

1412—Toulon, Ill.—Bids will be received until 10 a.m., Sept. 14, for furnishing the Stark County Poor House, Court House and jail with coal as may be required during the ensuing year. Address County Clk. W. E. Nixon, Stark County, Toulon, Ill.

+1413—Valentine, Neb.—Bids will be received by Cherry County until noon, Sept. 13, for furnishing three carloads of coal to be delivered in the basement of the Court House. Address County Clk. A. B. Green, Court House, Valentine, Neb.

1414—Granite City, Ill.—The Corn Products Refining Co. will contract some time about Sept. 20 for their fuel requirements until Apr. 1 of next year. About 35,000 tons of Illinois 1-in. and 2-in. screenings will be required. Address Pur. Agt. S. J. Petit, 213-217 Illinois St., Chicago, Ill.

+1415—New York, N. Y.—Sealed bids will be received until noon, Sept. 17, for furnishing approximately 3000 gross tons of buckwheat No. 1, for the Bellevue and Allied Hospitals. Address Central Purchasing Committee, Room 1226, Municipal Bldg., New York, N. Y.

+1416—Ely, Minn.—The Independent School District No. 12 will receive bids until 8 p.m., Sept 14, for supplying approximately 600 tons of bituminous coal during the next year. Address Secy. Arthur Toms, School Dist. No. 12, Ely, Minn.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

1094—Fairfield, Iowa—This contract (p. 117), which provides for furnishing the Independent school district at this place with approximately 1,200 bu. of coal during the ensuing year, has been awarded to **S. A. Power.** Address Secy. J. W. Dole, Independent School Dist., Fairfield, Iowa.

+1097—Norwalk, Conn.—This contract (p. 157), which provides for furnishing Board of Education at this place with approximately 100 tons of anthracite and bituminous coal, has been awarded to **Harris & Gans.** Address Board of Education, Norwalk, Conn.

+1122—West New York, N. J.—This contract (p. 158), which provides for furnishing the Board of Education with 400 tons of pea and 200 tons of nut coal, has been awarded to the **Consumers Coal Co.,** at $4.14 per ton for pea, and $5.91 for nut. Address Board of Education, West New York, N. J

1123—Indianapolis, Ind.—This contract (p. 158), which provides for furnishing the Indiana State School for Deaf with approximately 4000 tons of 1¼-in. standard screenings or washed coal and about 40 tons of nut, has been awarded to **A. B. Meyer & Co.** at $1.39 per ton, for Indiana No. 4 Vein coal. Other bids on this business were: Vandalia Coal Co., Indiana No. 4 Vein, $1.45; Indian Creek Mining Co., Indiana No. 5 Vein, $1.35; A. B. Meyer & Co., Washed Nos. 3, 4, 5, $1.79; Vandalia Coal Co., Indiana 5 and 6 Vein, 1¼-in. $1.30. The Manhattan range coal from Ohio was bought at $4.05. Address, Secy. Richard O. Johnson, Bd. of Trustees, Indiana State School for Deaf, 42nd St. & Monon R.R., Indianapolis, Ind.

1126—Hattiesburg, Miss.—This contract (p. 157), which provides for furnishing the local school board with approximately 200 tons of high-grade coal, has been awarded to **Morrison & Co.,** Jackson, Miss., at $2.65 for No. 2 lump coal delivered. Address Supt. F. B. Woodley, 417 Walnut St., Hattiesburg, Miss.

+1127—Indianapolis, Ind.—This contract (p. 158), which provides for furnishing the local school board with coal requirements during the ensuing year, has been awarded to the **Indianapolis Coal Co.** on the following basis: Linton No. 4, $2.40; Pocahontas mine-run, $3.45; nut and slack, $1.80; Kanawha, $3.65. Address Bus. Dir. John F. Cleland, Bd. of Edu., Indianapolis, Ind.

+1137—Jefferson City, Mo.—This contract (p. 199), which provides for furnishing the Missouri State Penitentiary with approximately 25,000 tons of coal during the ensuing year, has been awarded to the **Big Muddy Coal & Iron Co.,** of St. Louis at $1.33 per ton at the mine or $3.03 per ton delivered at the penitentiary. The award was let on the following guaranteed analysis: Moisture 7½%; ash, 8%; B.t.u. 13,450. The cost per million B.t.u. amounted to 12.016c. Penalties will be exacted for variations in moisture, ash and heat value lower than the standard specified. While the price per ton is higher than last year, the cost figures out slightly lower upon the specification basis. There were five other bidders on the contract. Address Warden D. C. McClung, Missouri State Penitentiary, Jefferson City, Mo.

+1139—Marion, Ohio—This contract (p. 199), which provides for furnishing the local School Board with approximately 480 tons of Hocking Valley 3-in. forked coal, has been distributed equally among the **J. L. Price Co., G. W. Paddock** and **P. Malo,** all of whom bid $2.70 per ton. The quotations include cost delivered in bins at the school buildings. Address Clk. Jeanette L. Hutchinson, Marion City Bd. of Edu., Marion, Ohio.

1141—Princeton, Ill.—This contract (p. 199), which provides for furnishing the fuel requirements of the Court House and Jail, has been awarded to **C. A. Oman** at $2.98 per ton for Carterville 6-in. lump delivered at the buildings. Address County Clk. James Fletcher, Bd. of Supervisors, Princeton, Ill.

1142—Sprague, Wash.—This contract (p. 199), which provides for furnishing the local Bd. of Education with coal, has been awarded to the **Potlatch Lumber Co.,** at $5.25 per ton for 70 tons of washed steam and $7.25 per ton for 10 tons of nut coal. Address Clk. J. F. Hall, School Dist. No. 6, Sprague, Wash.

+1143—Spokane, Wash.—This contract (pp. 199, 283), which provides for furnishing the local Board of Education with coal for the two high schools, has been let to the **Johnson-Bungay Fuel Co.** and the **Hawkeye Fuel Co.** The former received the contract for furnishing the Lewis & Clark High School with 700 tons of Corbin steam coal at $4.60 per ton, and the latter will furnish the North Central High School with 500 tons of Greenhill steam coal at $4.95 per ton. Experiments are being conducted with a view to using coal in place of wood in some of the grammer schools. Address Secy. E. A. Thomas, Bd. of Edu., Spokane, Wash.

+No. 1144—Nelsonville, Ohio—This contract (p. 199), which provides for furnishing the local Board of Education with mine-run coal, has been awarded to **J. M. Lama** at $1.07 per ton. Other bids on the contract were Alonzo Coakley, $1.12; John Wion, $1.11; Charles McClurg, $1.18; Thomas Shelton, $1.35; Bennett & Perry, $1.10; Aaron Green, $1.14; Wm. Coakley, $1.14. Address Clk. E. B. Beard, City Bd. of Edu., Nelsonville, Ohio.

COAL AGE

Vol. 8 NEW YORK, SEPTEMBER 18, 1915 No. 12

Convincing the Boss

Money Talks

A WELL-KNOWN American power engineer has succeeded in his profession because of his ability to quickly convince his superiors that he is right. He finds that the best way to convince is to talk in terms of the almighty dollar. When he says to the owner, “You are actually burning up every day in those furnaces a ten-dollar bill that could as well be saved,” the owner feels in his pocket for the escaped ten-spot. The engineer soon gets the stokers he wants.

He wants to increase the size of the plant and thereby advance his salary, so he says to the owner, “I'll work for you for nothing next year if you will give me your exhaust steam.” The owner's interest is again aroused, the exhaust steam is made to do good work, and the owner saves MORE than the engineer's salary.

“It's strange, isn't it,” he remarked one day as the owner was on an excursion through the plant, “that our oil costs more after we have used it than it costs to buy it.” The owner was stumped. He had never heard of such a thing, so he asked for an explanation. The engineer did himself proud in explaining the nuisance of oil in boilers. The filter he wanted was therefore quickly installed.

He always attacks his needs in an original way. He takes the owner by surprise whenever he can, so as to get due consideration. When he wanted a feed-water heater he said, “I need another helper. Can I have one? He won't cost anything.” This opened the way to his carefully planned argument. The feed-water heater was installed.

Owners, managers, superintendents and bosses are all human beings and they enjoy a change in method of attack. Don't hammer away for what you want in the same way all the time.

Money talks, so why not give it a chance to be heard?

Written for Power by W. F. SCHAPHORST, *New York City*

Correct Tipple Design--I

By M. L. Hyde*

SYNOPSIS—This is the first of two articles on this subject. It sets forth what a tipple should be and what it must be able to do in order to fulfill to the highest degree the function for which it was built.

Between satisfied custom and efficient mining comes the correctly designed tipple as a connecting link, meeting the demands of each. Such a tipple must satisfy the desire of the sales department for proper grading combined with proper loading and careful cleaning—and of the operating department for moderate first cost combined with economical operation.

No matter how high the coal in quality, no matter how well mined, unless the demands of the consumer are complied with, failure results.

The elasticity of a tipple, in order to grade and mix various sizes, must therefore be unlimited. Its ability to load anything the railroad supplies, from a "battleship" to an automobile box car, must also be unlimited; and this loading must be accomplished with a minimum amount of resultant slack. The equipment for picking must be complete in every particular, even though at the time of building there is every indication that the coal to be handled will reach the tipple clean. It is false economy to omit machinery for performing this work, as a clean seam today may be a dirty one tomorrow.

If one stops to think of the strides made in automatic stokers, heaters, furnaces, gas producers, ranges, etc., during the past few years, he will readily appreciate the necessity for unlimited elasticity in every department of the tipple if he wishes to keep pace with the consumer's ingenuity in thinking up new requirements to be met. The tipple, to conquer these problems for the next 30 or 40 years, must indeed be almost human, and a shorter life is not commensurate with the investment.

Among the general features essential to a tipple are the ability to make as many grades, and any mixture thereof, as the market to be catered to may call for; to handle each of these grades over the shortest distances possible without drop or change in direction; to handle first the lump, then the egg, then the nut, etc., each in proportion to its market value, over the gentlest course, allowing for lip screening of the large grades and for mechanical loading where the capacity required is such as to necessitate it; to allow of cracking the lump to any given smaller size, with a minimum loss in fines (this being a condition coming more and more to the front owing to the antagonism of the buyer to large lumps, which is only reasonable, and therefore it is safe to predict that the near future will see lump a drug on the market, with a heavy demand for a 6- or 7-in. cobble); to handle rock from the mine car without allowing it to come in contact with any of the coal handling machinery; to handle local coal without the expense of cleaning; to furnish slack, or nut and slack, to the boiler-room; to furnish any combination of grades for locomotive coaling purposes, rescreening, washing, for coke ovens or for auxiliary outside storage to be held for boiler or local purposes in case of a shutdown; to allow of removing waste from the tables, spilled coal about the cars and dirt shoveled from them with the least possible cost and the least complication of equipment; to allow of spotting and loading cars regardless of weather or other conditions. The tipple should, furthermore, have a mechanical equipment low in power consumption and so constructed that repairs and replacements can be made by the local force. Finally it should be moderate in first cost and low in operation and upkeep expense.

We will first take the details of all equipment making up the complete unit, the reasons for their being given preference, and then describe a tipple embodying them.

Good Type of Headframe

About four years ago the Allen & Garcia Co., of Chicago, put on the market a patented headframe having two main columns placed in the middle of the shaft curbing and at either end just back of the guides, these members being carried by brackets from the columns. The center guides were carried by a central column hung from the main structure so as not to rest on the shaft timbers.

When adapted to an end hoist tower the sheaves are carried directly on an A-frame of the same width as the columns, the forward leg of which is carried down to the ground outside of a resultant of the cable stress. This construction affords a rigid tower, easily erected and maintained, and costing but little more than half as much as the standard six-leg frame. It should be furnished complete with landing dogs at the surface, gates at all landings, ropes and their fittings, and three sheaves (an extra one being carried in case of emergency). Arrangements should also be made for replacing without serious inconvenience a broken sheave and for taking off the ropes and replacing them when such renewal is necessary.

Mines having a capacity not exceeding 600 tons, where the topman also acts as lampman, can handle the men to and from the mine to best advantage by having the landing stage for men at the same elevation as the topman's office in the tipple. With this arrangement the topman gives out all lamps at the lamp house and then goes to his office and handles the signals for lowering the men. Each miner, before getting on the cage, hangs his check on the check-board placed on the side of the topman's office.

On leaving the cage at the end of the shift he removes his check and hooks it on the lamp, the numbers of both corresponding; he then returns the lamp to the lamp house. If he fails to hook his check on his lamp he cannot get the lamp in the morning. This forces him to remove his check from the board, which affords an accurate record of the men in the mine at any time.

The car tally-board is also located in the topman's house, so that each loader can ascertain at the end of the shift just what his credits for the day are. The topman does not have to leave his office except to send

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*Pembina Coal Operators, Ltd., Evansburgh, Alta., Canada.

down supplies, and no one can get in the mine without his permission.

Mines having a capacity of more than 600 tons and using a separate lampman and surface cager can lower the men from the ground level to better advantage than from the upper landing, though the same tally system is recommended.

Main Structure

There is no excuse for a tipple not having clean-cut, uniform lines. It should be in harmony with the rest of the plant units, pleasing to the eye and an ornament to the plant as a whole. A tipple covered with bumps and humps, two or three stories high, is no credit to either designer or owner and since it is the highest structure about the mine, its abnormality ruins all possibility of harmony and beauty in the general layout. Moreover, all these bumps cost money.

A low building, with easy stream-line design, costs less, looks better, is easier repainted, re-sided, reroofed and protected from fire than any other type; and having a low center of gravity, the live loads from screens, etc., are easy on both structure and foundations.

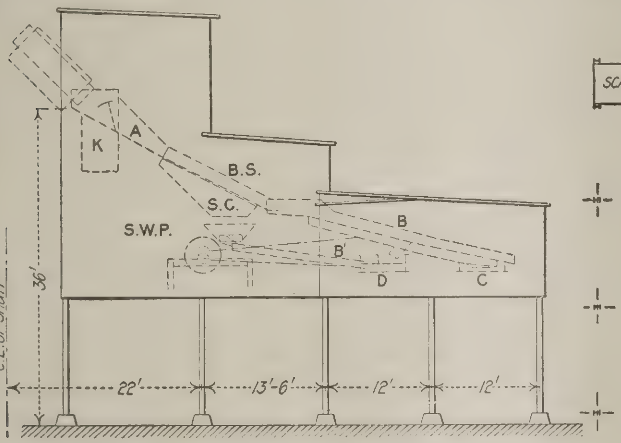

FIG. 1. AN ARRANGEMENT ALLOWING GENTLE HANDLING OF LUMP

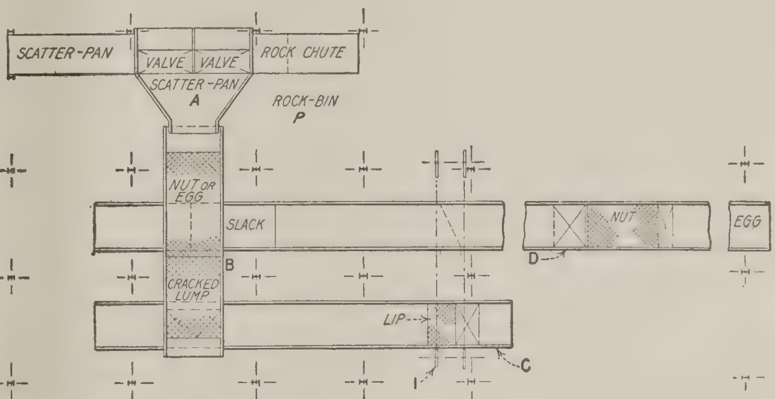

FIG. 2. GENERAL PLAN OF A TIPPLE, ILLUSTRATING CLEARANCES

All-steel construction is recommended, with columns of 8-in. H-sections and flooring of standard 10-in. I-beams covered with ¼-in. checkered plates. The roof should be of Hy-rib and concrete plaster 2 in. thick, set on 4-in. I-beams and whitewashed on the under side for light. Siding should be of 20-gage American ingot corrugated iron, or its equal. The whole structure should be painted with two coats of graphite, with a slate-gray body and black trimming. Foundations should set 24 in. above the ground, the latter being carefully leveled and ditched.

Wire-ribbed glass skylights should bear direct on every machine, and the picking-room roof should be so fitted for its entire length.

Heating coils must be furnished for the topman's office and the picking room. The latter room should be arranged with sliding shutters in the side walls for ventilation during hot weather. The entire structure should be well lighted with electricity, especially between the tracks and in the picking room, where the lamps should be mounted in an inverted white enameled trough set 36 in. over the tables, with lamps on 4-ft. centers.

Trap doors should be placed in the floor of the picking room to permit the removal of sweepings. This room should be partitioned off from the rest of the building, and should be free of windows. There is no way to keep the picker boys from skylarking when the cat's away, which often results in broken windows or a boy being hurt. If they are shut off from all machinery the latter cannot easily happen.

With the building designed along the lines suggested, roof trusses, kneebraces and latticed members of all sorts are unnecessary. There is no place for coal dust to accumulate, and the roof presents a smooth inner surface, which a coat of whitewash applied now and then keeps clean, light and cheerful.

Both speaking tubes and electric bells should connect the picking room to the topman's office. Telephones and pneumatic signals should connect the topman's office with the surface landing, mine, mine manager's office and hoist engine room. This office should have a desk on which to make out car sheets, records, etc.

Below the tipple, at the ground level, the tipple foreman should have an office with a desk, where bills of lading can be filled in and tipple time books, car seals, etc., kept. Located here should be locked tool-boxes, containing the tools necessary for making ordinary repairs, as well as car pinchers, shovels for cleaning up and other equipment required in the day's work, all marked with the department number of the tipple.

Waste Bins Should Be Under the Floor

Waste bins for intermediate storage of refuse from picking tables should set directly under the floor of the picking room. This obviates the installation of conveying machinery to handle gritty substances. These bins are the only ones recommended to be put under the tipple; all others should be well removed from it. Waste from the tables is not subject to spontaneous combustion and therefore not dangerous; nor do the bins required to hold it increase the height of the structure; whereas if the screens were set over small coal bins, not only would the element of danger be introduced, but the tipple height would necessarily be increased, with the extra drop to all the better grades that must pass over the bins on their way to the cars.

It will be found cheaper and more satisfactory to locate all storage bins away from the tipple. These bins should be cylindrical, with conical bottoms and lined throughout with cement, if the maximum tonnage with maximum safety and cleanliness is to be obtained for the smallest first cost.

The tipple building should be so designed that neither wagons nor carts will ever have to go under it. These cut up the ground and as a result of spillage are dirty. Furthermore, underneath a tipple is no place for a horse.

As part of the complete tipple a 50-ton empty track scale and a 125-ton loaded track scale for railway cars should be included, also a platform located at the empty scale for storing coal doors for box-cars. These, or the materials for making them, are usually furnished by the railroads in car lots, and it saves much time if a platform is furnished upon which they may be conveniently stored.

Coal-Handling Equipment in Detail

Self-dumping cages with rollers at top of dumping platform are recommended. With this design greater leverage, and consequently a reduced stress on both cage and headframe, are secured. The cages should be designed to allow the car to project beyond the ends of the cage, so that in the dumped position the car would be lifted a minimum distance above the receiving hopper, insuring no drop and no spilling of the car's contents down the shaft.

The guide irons should be so curved that during the dumping period the car is rapidly dropped to the emptying position and while discharging is moved slowly. Horns are preferable to drop-rails for holding cars on the cage. Double bridle chains should be used on every cage in which it is intended to handle men.

There are many advocates of the platform cage with automatic pushers for removing cars therefrom, after which they go to a rotary or cross-over dump. The first cost, as well as the operating expense of a tipple so designed, far exceeds that of one with a self-dumping cage. Its capacity is less, and even with rotary dumps there is absolutely no saving in breakage over a properly designed self-dumping equipment. Some mines produce a dusty coal, and cars fitted with end doors are objected to on account of leakage along haulage roads. An all-steel car can easily be built with end door to obviate this difficulty, and the first cost is but a few dollars higher than that of the solid-box car.

Receiving Hopper

The receiving hopper, often called the scatter pan, especially in tipples using bar screens, should be built with ¼-in. steel sides and $\frac{5}{16}$-in. steel bottom plates, with an angle of 28 deg. along the bottom. It should have sides extending straight for a distance sufficient to allow of placing hinged valves in its bottom, through which rock or local coal can be diverted without going over the tipple machinery proper. These valves should be counterweighted and operated by levers in the topman's office. From the valve the hopper sides should converge to a discharge opening approximately 5 ft. wide. It is not good practice to make this a storage hopper; in fact it should be as short as possible, being the only place in the tipple where the coal is allowed to flow by gravity, and consequently with some slight damage. The hopper bottom should ease off to a level discharge before the coal leaves it, thereby retarding the flow decidedly.

From the receiving hopper the coal should pass either to a bar screen (if the screened lump basis is in force), to a weigh pan direct, or to a preliminary shaker, if a run-of-mine basis is employed, the car being weighed in the latter case on platform scales before dumping.

Weigh pans for lump or run-of-mine coal are objectable. Throwing the entire contents of the mine car into the pan in a mass, and then dropping it out again in a mass, results in unreasonable breakage. Considerable extra height is required for the tipple, and all in all the practice has little to recommend it.

Fig. 1 shows an efficient way of overcoming this vicious handling of the lump when the coal is friable, though requiring a little more office work. The coal passes from the receiving hopper to the bar screen *BS*, the lump going direct to the shaker *B*, and the fines falling to the chute *SC*, thence to the weigh pan *SWP*, where it is weighed and discharged to the screen *B*.

It is assumed that with this system steel mine cars of uniform weight are used. These are weighed loaded, on platform scales set to balance the empty car, thus recording the net weight of the car's contents, from which at the end of the day the weight of the slack is subtracted, leaving the weight of lump for which each loader is to be credited.

This gives an accurate record of every pound of coal leaving the mine and allows of the easiest possible handling of the lump and egg. It requires an extra weighman and extra work in the office, which is more than counterbalanced by the saving in lump and the correctness of the records. With a hard coal this would prove an unnecessary refinement.

Bar screens are always of a standard adopted by the locality in which they are used.

Weigh Pan Should Be Substantial

The weigh pan should be of substantial design, with ¼-in. sides and $\frac{5}{16}$-in. bottom, and should be suspended from the tipple scales (which should be of at least six times the capacity of the work for which they are required), equipped with quick reading dial. The pan should receive the mass of coal and bring it to a standstill as quickly, yet as easily, as possible, and should discharge it in the same way.

On being discharged from the receiving hopper or weigh pan, a preliminary shaker is recommended. This serves the purpose of feeder to the picking tables and of a coarse separator as well. It handles the coal gently and without drop, makes a thorough separation of the lump from the smaller sizes and is low in first cost.

For capacities up to 1,500 tons per day a screen 6 ft. wide is ample, and for capacities up to 3,000 tons an 8-ft. screen is sufficient. If the egg, nut and slack are sent to one table, three 3-ft. sections of egg perforations will be required, and four sections of nut perforations if the nut and slack go to one table. This should be the extreme length of screen plate installed, additional capacity being gained through additional width. This is because of needless attrition when the coal is jigged over an unnecessary length of perforated plates. With the length of perforations suggested nothing will be gained by introducing a feeder before the screen.

One-quarter-inch side plates and $\frac{5}{16}$-in. bottom plates should be used in the screen construction. Perforated plates should be bolted on with lock-washer bolts, and extra plates of different sized perforations should be carried in stock on the tipple floor ready for use.

The path of the coal over this screen should be as follows: The egg, nut and slack falling through to the lower deck pass direct to the small-coal picking table. The lump going over the egg screen reaches the 6- or 7-in. cobble perforations, the undersize going to the lump table and the oversize, or large lumps, going to a cracker. In case it is desired to load lump direct, the cobble screen plate is removed and this coal all sent to the lump table.

This screen is driven through connecting rods from an eccentric shaft carried on an independent steel framework, the shaft in turn being driven by belting from a 20-hp. motor. The screen should be suspended by four hanger rods, should set at an angle of 14 deg. for the egg screen and 12 deg. for the cobble screen. A speed of 90 r.p.m. will give best results, and no trouble need be feared from undue vibration.

Traveling Picking Tables

Manufacturers mostly recommend conveyors of either the apron or drag type, preferably the former, claiming less attrition and a more uniform spread to the ribbon of coal on the table. Neither of these advantages shows up well enough in actual practice to warrant its consideration in preference to the horizontal shaking type of table used for the past decade in Great Britain in many of the best-designed tipples which it has been the writer's pleasure to study.

The apron conveyor consists of two strands of roller chain, carrying plates or trays of steel from 3 to 5 ft. wide between them. They can only be used as picking tables when carrying material on the top strand. They are excessively heavy in weight and high in first cost. Expensive structures are required for their support because of the weight and height necessary. The chains require continual oiling from one end of the conveyor to the other, as well as all machinery at both head and foot.

Fine wet coal causes considerable trouble on this type of conveyor, particularly in cold weather, as it gets between the overlapping edges of the plates and freezes them together during the night shutdown, putting a tremendous stress, often accompanied with serious results, on the whole mechanism when starting up in the morning. The only remedy for this is the placing of steam coils under the whole length of the carrying strand, in which steam must be carried night and day during a cold spell.

With dry, fine coal the apron is dirty, for fines leak between the plates and fall to the bottom strand, where they are rolled around until a sufficient accumulation warrants shoveling them away. Owing to the chains being on the outside edges of the carrying plates, guards are required over them to protect the arms of the pickers. These guards take up about 12 in., and force the boys to stand that much farther from the coal to be handled, making a decidedly uncomfortable reach to the center of a 5-ft. table, often to the neglect of dirty coal traveling there.

Most serious of all drawbacks to this table is its inelasticity when mixing two or more sizes. Where this is done the mixture should always be made by taking the already picked grades from their given tables and transferring them to the table carrying the largest size of the desired mixture. If this method is pursued all coal flows in one direction, over one chute to the car to be loaded. It reaches the car nicely mixed and fully lip-screened. This method also allows of the most gentle discharge. Where the different tables discharge their various grades to gathering chutes leading to a common car-loading chute, all these advantages are sacrificed.

As the apron has but one point of discharge, namely, its head, all grades must be carried to that end and there delivered to gathering chutes. This can be accomplished with open cars, but not with both open and box-cars. The mixture is made directly over the car at a point where it is hard to dispose of lip-screenings. The mixing chutes must necessarily be long, and those for the small grades steep, increasing the height and cost of the entire structure, as well as introducing breakage at the critical point.

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The Indiana Situation

A number of new coal-mining companies are projected for operation this fall and winter in Indiana, but owing to the unsatisfactory state of trade, plans for their consummation are not progressing as rapidly as was expected. Those interested in these new ventures are now giving much thought to the future outlook.

Former State Mine Inspector Pearce a few weeks ago took occasion in an interview to show the hazards of the coal business as now conducted in the state of Indiana. Among other things, he said that in 1910 there were 182 mines operating in the state, employing 31,171 persons; whereas at the present time there are only 126 mines, employing 20,518 persons. He emphasized the fact that the production of coal has reached a deplorable state, and if continued will drive more operators into bankruptcy. The present situation not only results in waste of coal but destroys life and property, and makes idle each year hundreds of additional employees, until at last conditions have well-nigh become intolerable.

Mr. Pearce thinks that the Federal Government, as well as the officials of Indiana, should take cognizance of the evils of overproduction, which result in ruinous competition and waste of the coal resources of the state.

The more prominent operators are endeavoring to prevent ruinous competition in marketing their product, but have so far found little encouragement from either the Federal or state authorities in following such a course.

What is to happen to the coal producers in this state in the matter of marketing their production at profitable prices is a problem. It is a certainty that they will never be able to obtain better prices until they act more in coöperation, and it is just as evident that the spirit of cynicism, distrust and suspicion must be replaced by cohesion before better times are possible. The Indiana trade needs more than anything else a leader. There are men engaged in the state's coal industry qualified to lead and whom a great majority of the shippers and producers would follow. The commercial, financial and manufacturing world is replete with associations now doing effective work for their respective lines of business in this country, and when one looks into the demoralization and bankruptcies of the coal-producing industry of the Middle Western states it seems to show lack of leadership and a state of incapacity which is little less than criminal.

Deaths from Explosives and from Electricity

In a recent monthly statement of the United States Bureau of Mines compiled by Albert H. Fay is given an interesting table, here quoted, showing the conditions under which explosives and electricity caused death. The table that relates to explosives shows that 18 per cent. of the accidents occur during the handling and transportation of the explosives and approximately 25 per cent. may be grouped as due to premature blasts and short fuses.

It will be noted that comparatively few fatalities at coal mines are caused by the thawing of explosives and still fewer are due to unexploded charges in coal and débris. The total number of fatalities owing to shots breaking through the pillar between working places is 220, or 6.01 per cent., which shows how important is this matter.

CLASSIFICATION OF COAL-MINING CONDITIONS WHICH LEAD TO FATALITIES IN WHICH EXPLOSIVES CAUSED DEATH

State	Period	Handling and Transportation	Handling Caps, Detonators, Squibs, and Fuse	Thawing Explosives	Tamping	Premature Blasts and Short Fuse	Blown Out or Windy Shot	Flying Pieces of Rock or Coal	Returning Too Soon	Blast Delayed	Shot Breaking Through Pillar	Suffocation by Powder Gas	Striking Unexploded Charge in Removing Debris	Drilling into Unexploded Charge	Miscellaneous	Total
Alabama	1894–1913	7	....	....	2	9	12	8	16	1	2	1	....	....	28	86
Arkansas	1905–1913	.....	....	....	....	.....	....	.....	....	....	....	....	....		15	15
Colorado	1887–1912	2	2	....	....	18	3	4	2	2	1	6	....	9	7	56
Georgia	1909–1913	....	....	....	....	.....	....	.....	....	....	....	....	....	....	1	1
Illinois	1882–1912	86	1	....	10	95	81	48	52	3	32	7	....	14	25	454
Indiana	1891–1913	23	....	....	3	30	16	6	13	3	12	19	....	2	11	138
Iowa	1881–1912	17	1	....	2	20	4	26	5	1	4	1	....	3	6	90
Kansas	1885–1912	14	9	....	1	12	21	23	5	....	4	30	....	....	19	138
Kentucky	1884–1913	13	5	....	...	11	17	3	13	1	7	6	....	5	10	91
Maryland	1883–1913	3	1	....	...	1	....	.....	1	....	....	....	....	....	....	6
Michigan	1900–1913	.....	1	....	...	6	....	2	....	1	1	1	....	....	3	15
Missouri	1889–1913	3	....	....	...	4	....	8	8	2	5	8	....	1	4	43
Montana	1891–1913	2	....	1	...	.....	....	1	3	....	4	1	....	....	3	15
New Mexico	1893–1912	.....	....	....	...	4	5	5	1	2	1	1	....	2	.....	21
North Dakota	1908–1913	.....	....	....	....	1	....	.....	....	....	....	....	....	....	2	3
Ohio	1874–1912	19	2	....	...	47	1	12	9	3	27	11	....	....	42	173
Oklahoma	1893–1912	16	1	....	....	9	19	14	10	3	6	6	....	....	27	111
Oregon	1909–1913	.....	....	....	....	.....	....	.....	....	....	...	....	....	....	.....	....
Pennsylvania (anthracite)	1870–1912	320	10	24	89	570	....	397	125	7	76	8	3	26	105	1760
Pennsylvania (bituminous)	1877–1912	50	6	1	2	34	13	30	19	1	24	3	....	3	2	188
Tennessee	1891–1913	3	....	....	...	2	5	2	4	....	3	5	....	....	25	49
Texas	1909–1913	.....	....	....	....	.....	....	.....	....	....	....	....	....	....	2	2
Utah	1892–1913	1	....	....	...	3	....	1	....	....	....	....	....	....	.....	5
Virginia	1909–1913	.....	....	....	...	.....	....	.....	....	....	....	....	....	....	10	10
Washington	1886–1912	2	2	2		1	....	.....	1	2	1	15	....	3	3	32
West Virginia	1890–1912	54	4	2	3	29	6	2	7	....	9	1	....	1	29	147
Wyoming	1908–1912	1	....	....	...	2	....	.....	6	....	1	....	....	2	.....	12
Total		636	45	30	112	908	203	592	300	32	220	130	3	71	379	3661
Percentage of total		17.37	1.23	0.82	3.06	24.80	5.55	16.17	8.19	0.88	6.01	3.55	0.08	1.94	10.35	100

The first dates in the table classifying electricity accidents are not those of the introduction of electricity into the mine, but are the dates when the first recorded accident from electricity occurred. The descriptions of the accidents in inspector's reports are in some cases not sufficiently clear. For this reason the "miscellaneous" list is somewhat large and constitutes 17.29 per cent. of the whole. Contact with machine feed wire and walking or falling against trolley wires are the leading sources of accident. Contacts with feed wires caused 126 deaths, while 361 men died from touching trolley wires.

CLASSIFICATION OF FATALITIES IN AND AROUND COAL MINES, CAUSED BY ELECTRICITY, SINCE ITS INTRODUCTION INTO THE MINES, BY STATES, SHOWING PERIOD COVERED

State	Period	Direct Contact with Trolley Wire							Tool or Iron Bar Striking Trolley Wire	Contact with Mining Machine	Contact with Machine Feed Wire	Contact with Haulage Locomotive	While Repairing Line Wires	Miscellaneous Electrical Causes	Total
		While Climbing on Car or Motor	While Riding Car or Motor	While Replacing Trolley Pole	Falling or Walking Against Wire	Stepping on Fallen Wire	Repairing Guard Boards	Other Trolley Wire Cont'ts							
Alabama	1905–1913	....	....	....	.....	...	...	....	....	....	.....	...	....	48	48
Arkansas	....	....	....	....	.....	...	...	....	....	....	.....	...	....	.....	0
Colorado	1901–1913	....	....	....	.....	...	...	9	....	....	3	...	....	8	20
Georgia	....	....	....	....	.....	...	...	....	....	....	.....	...	....	.....	0
Illinois	1903–1912	....	3	....	3	1	...	5	....	2	2	...	....	1	17
Indiana	1903–1913	1	....	....	.....	...	...	3	....	1	1	...	....	1	7
Iowa	1909–1913	....	....	....	.....	...	...	....	....	....	.....	...	....	1	1
Kansas	1895–1912	....	....	....	.....	...	...	....	....	1	1	...	....	.....	2
Kentucky	1906–1913	....	2	....	3	...	...	12	....	....	1	...	....	.....	18
Maryland	....	....	....	....	.....	...	...	....	....	....	.....	...	....	.....	0
Michigan	1906–1913	....	....	....	.....	...	...	....	....	2	.....	...	....	3	5
Missouri	1912–1913	....	....	....	1	...	...	....	....	1	.....	...	....	.....	2
Montana	1906–1913	....	....	....	1	...	...	....	....	....	.....	...	....	.....	1
New Mexico	1899–1912	....	....	....	.....	...	...	....	....	....	1	...	....	.....	1
N. Dakota	....	....	....	....	.....	...	...	....	....	....	.....	...	....	.....	0
Ohio	1896–1912	....	....	....	.....	...	...	23	4	2	21	...	1	3	54
Oklahoma	1898–1913	....	3	....	.....	...	...	....	....	1	2	...	1	3	10
Oregon	....	....	....	....	.....	...	...	....	....	....	.....	...	....	.....	0
Pennsylvania (anthracite)	1898–1912	....	2	....	6	1	2	3	1	....	4	2	1	10	32
Pennsylvania (bituminous)	1896–1912	32	7	9	73	...	2	15	32	11	54	1	7	13	256
Tennessee	1903–1913	....	1	....	.....	...	...	10	....	1	5	...	....	.....	17
Texas	1909–1913	....	....	....	.....	...	...	....	....	....	.....	...	....	1	1
Utah	1911–1913	....	....	....	.....	...	...	....	1	....	.....	...	....	.....	1
Virginia	1909–1913	....	....	....	.....	...	...	....	....	....	.....	...	....	14	14
Washington	1906–1913	3	1	1	1	1	1	5	3	....	.....	...	1	.....	17
W. Virginia	1899–1912	7	8	4	1	...	...	43	9	3	30	3	2	5	115
Wyoming	1908–1913	1	....	....	1	...	...	....	....	....	1	...	....	.....	3
Total	....	44	27	14	90	3	5	128	50	25	126	6	13	111	642
Percentage of total	....	6.85	4.21	2.18	14.02	.47	.78	19.94	7.79	3.89	19.63	.93	2.02	17.29	100.00

Of course some of the causes overlap slightly. For instance, "Returning too soon," "Flying pieces of rock or coal," "Blast delayed" and "Suffocation by powder gas" might generally be classed under the first head. In compiling the table the statement of the inspector has been taken as establishing the preferable classification.

Coal Mining at the Panama-Pacific Exposition

Special Correspondence

SYNOPSIS—There are a number of interesting and instructive exhibits arranged by various coal companies and machinery manufacturers. Moving pictures play an important part in the educational work.

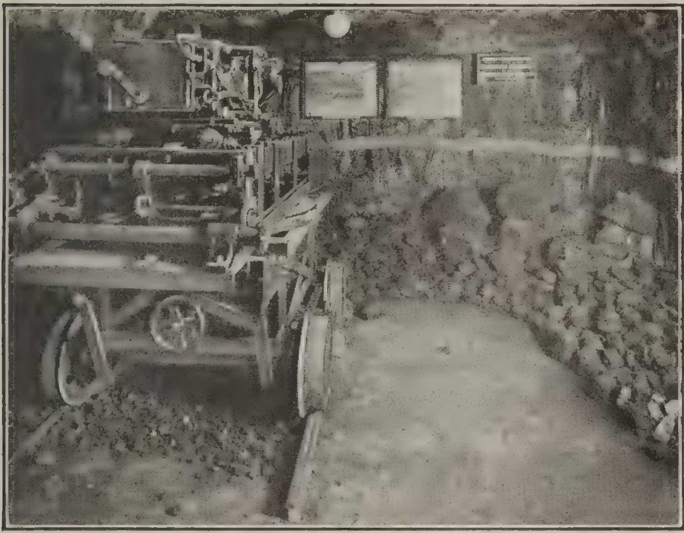
A person whose primary interest is coal mining might naturally assume that in an exposition located on the Pacific Coast and so near the stirring scenes of '49 there would be little of interest to a coal man and pertinent to the coal industry. Such, however, is far from the case, and no place on the entire exposition grounds attracts more interest or has a greater number of visitors than The Mine, which was illustrated and briefly described in a recent issue of *Coal Age*. This exhibit alone is worthy of a more extended notice, and moreover coal mining is shown not only in The Mine but in a number of other interesting ways.

The Mining and Metallurgical Building covers an area of 172,555 sq.ft., is located directly on the Marina, overlooking San Francisco Bay, and its north portico is one of the most advantageous locations from which to view the daily flights of the airships. The building contains not only mining exhibits, but also such allied displays as those of the United States Geological Survey and the United States Mint. There are also other Federal exhibits, such as the model post office of the United States Post Office Department.

Exhibits Are Practical and Educational

The exhibits in the mining building are essentially educational in character, and there is a pleasing absence of mere piles of ore, rock and coal that so often make an exposition seem little more than a glorified stone quarry or coal yard. Seldom is it possible to see side by side in close and striking contrast and upon a full-sized scale coal-mining methods as carried on in West Virginia, Kentucky, the anthracite region of Pennsylvania, the Rocky Mountain coal fields and the mines of the Pacific Coast.

An interesting exhibit is that of the Consolidation Coal Co. in the Elkhorn coal field of Jenkins, Ky. The mine represented produces gas coal and an excellent byproduct coking coal that is of particular interest at the present time owing to the shortage of coal-tar products. A Jeffrey-Drennan turret coal cutter is shown cutting in a band half way up the coal section. Although the ribs are of painted canvas, the effect is realistic, the realism being enhanced by the piles of coal about the face and ribs and by the turret cutter and a portable electric pump exhibited at the rear of the coal cutter by the Fairmont Mining Machinery Co. A shortwall Jeffrey coal cutter forms part of the exhibit of the Pocohontas Consolidated Collieries Co. in room 11.



CONSOLIDATION COAL CO.'S EXHIBIT, SHOWING TYPICAL ROOM IN ONE OF ITS ELKHORN, KY., MINES

EXHIBIT OF THE HERCULES POWDER CO., SHOWING MODEL OF A BLACK-POWDER MILL

Another exhibit shows the method of mining in a pitching seam as carried on by the Pacific Coast Coal Co., of Seattle, Wash. The face is reached through an inclined chute, which is steep and low, so that only those visitors will see the actual working conditions who are willing to climb up the chute at some personal inconvenience. The realistic reproduction in The Mine of underground conditions is shown very well in an exhibit of a Baldwin-Westinghouse electric locomotive hauling a car along the mine entry.

Mine-safety devices, safety lamps and electric danger signals are shown in The Mine by the Life-Saving Devices Co., the Concordia Safety Lamp Co., the Mine Safety Appliances Co. and the Baldwin Carbide Lamp Co. Some of these companies also have exhibits on the main floor over The Mine, where are also shown oxygen-breathing rescue apparatus of the Draeger, Fleuss and Westfalia types. The realism of the mine is carried out by the use of safety lamps in many places, and many visitors are provided with them as they enter the mine. Many of the guides are dressed as miners, and as The Mine is in made ground and below the water level of the bay there is a very distinctive mine odor.

The Bureau of Mines shows in a case an excellent exhibit of safety lamps and other lighting devices, and by means of a working model the dust-distributing device of George S. Rice, chief mining engineer of the Bureau.

Moving Pictures Much in Evidence

One of the most striking advances to be noted in the Panama-Pacific Exposition is the extensive use of moving pictures, mainly as an educational feature, with the advertising feature absent or only very incidental. In the Palace of Mines three moving-picture shows are in almost constant operation. One of these in The Mine shows scenes from practical mining and quarry work, another on the main floor shows general technical and geological films, while in still another in the other end of the building and forming part of the exhibit of the United States Steel Corporation are shown many phases of the mining of coal and iron ore, the coking of coal and the manufacture and fabrication of iron and steel.

One of the novel features of the mining exhibit is the White ambulance and rescue truck of the Bureau of Mines. This is equipped with oxygen-breathing apparatus, first-aid supplies and other rescue appliances, and twice each day, at 11 a.m. and 2 p.m., it is brought into use as a part of a rescue and first-aid demonstration. At these hours a loud report is heard and smoke issues from The Mine, whereupon the rescue truck and corps dash up to the north entrance of the building, the rescue men don their apparatus and the corps enters The Mine and soon returns with the supposed victim, who is placed on a raised platform and first aid given to him. This demonstration never fails to attract a crowd.

The Consolidation Coal Co., in addition to its display in The Mine, has an excellent exhibit of photographs and charts near the south entrance to the mining building, and in this same space are shown some very large blocks of coal that must have been extremely difficult to mine and transport to San Francisco.

The United States Steel Corporation coal-mining interests are represented by numerous photographs of the H. C. Frick Coke Co., the Bunsen Coal Co., and the National Mining Co. Samples of coal from various districts are also shown. A most interesting model shows a complete modern coal-and-coke plant, $\frac{1}{16}$ of full size, having a capacity of from 1,200 to 1,300 tons of coke per day. The headframe and coal bin are of steel all foundations and the shaft lining of concrete, and the subsidiary buildings, such as boiler, engine, oil, supply lamp and other houses and shops, are all substantially constructed with galvanized corrugated roofs. A hot-gas flue conducts the oven gases to the boilers. The ovens are mechanically operated. In this model, which was awarded a "Medal of Honor," great prominence is naturally given to the many uses of steel and concrete in a modern coal mine. All mine cars are of steel, with steel wheels, and in The Mine the shaft bottom and all pump rooms, stables, mine offices, engine rooms, first-aid rooms, air bridges, overcasts, etc., are of either steel or concrete. Steel mine timbers and ties are also much in evidence. The transportation of coal and ore is illustrated by many photographs and models of lake carriers. One of the most attractive exhibits in the mining building is that of the Hercules Powder Co. It includes the ingredients and finished products for a number of different explosives, a working model of a black-powder mill, the methods of testing detonators, a magazine, and the methods of using explosives, the whole forming an unusually complete and instructive exhibit. This company also has a magazine in The Mine.

Exhibits Covering Welfare Work

In view of the great advance made along sociological lines in connection with mining since the St. Louis Exposition, one naturally looks for prominent welfare exhibits. The Bureau of Mines has displayed a number of photographs and a diagram of a model mining village, with the principal welfare points prominently brought out. In the United States Steel exhibit a large section is devoted to the welfare work as carried on by the various subsidiary companies comprising the corporation. No special prominence is given to the mining part of the work, but large numbers of photographs and a few models illustrate the safety-first campaign.

SHOWING A BALDWIN-WESTINGHOUSE ELECTRIC LOCOMOTIVE HAULING LOADED CAR ALONG ENTRY

The methods used to impress the necessity of "safety first" are illustrated by photographs, transparencies and tabulated data. The several phases illustrated are first-aid crews, rescue crews, rescue cars, emergency-dressing stations and hospitals. The subject of sanitation is also taken up and typical bath and change houses, sanitary drinking fountains, modern houses, etc., are shown. Model gardens and mining towns are likewise shown, also the work of district nurses, children's playgrounds, club houses, etc. In fact every feature of mining and metallurgical sociology is well illustrated.

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In Some Mines the proposal to institute extensive watering of the roadways to counteract the influence of coal dust directs attention to the question of miner's worm disease. The removal of one danger by such means it is feared may introduce another evil, especially in deep warm mines. It may be that miner's disease is not likely to spread extensively in pits where the temperature can be kept below 64 degrees, also that it cannot exist in very dry pits; but the experience in Germany is to the effect that it spreads rapidly after the system of watering the dust to prevent dust explosions is introduced. Investigation has shown conclusively that the danger from the worm is greatest in warm and moist pits, and the effects of watering must be more closely watched when so much of the coal is being extracted from great depths.

Supervision of Mining Details

By G. S. Brackett*

SYNOPSIS—Mine operation as usually practiced requires the performance of much dead work or work which does not directly contribute to production. If the "floating gang" could be eliminated, either wholly or in part, and necessary repairs carried out under the direct supervision of the foreman, expenses might be decidedly reduced.

Suppose you could lift the cover off your mine and watch each detail of the production of coal and each movement of your employees from starting time until evening. Suppose that you could give the same supervision over your employees that exists in a department store or a factory. There is no doubt that your cost of production would be less; but our efforts along this line can only be approximations. These methods can, however, be approached as closely as possible, but we face the danger of paying more for bosses than is harvested in results.

A well-managed and well-equipped factory has practically every effort directed in the production of the finished product, ready for shipment, and every employee is under almost constant supervision, with their labors computed from a time clock. Repairs are mostly done by laying a piece of machinery idle, and every extra piece of work outside the actual production has the careful attention of the management as to its estimated cost and most opportune time of accomplishment.

Many mine employees work by the hour, and the only guarantee of their productive ability or efficiency is the foreman's judgment, from time to time, of the amount of work accomplished. Even if the foreman is an excellent judge, a certain period of time has passed and some labor has been wasted before further loss is eliminated. This time is probably considerable, as a careful foreman wants to be sure he is not unjust. The actual loss is never recovered.

Payroll Costs

The payroll costs at a mine may be divided into the following four general heads, subject to any subdivisions each management desires:

A. The cost of management, office and supervision at the mine, including all expenses which continue regardless of the production. Under this head come pumpmen, stable men, bosses, firebosses, electrician, and in many cases the power house.

B. The cost of mining the coal and placing it on board the mine car at the working face.

C. The cost of transporting the coal from the face and loading onto the railroad car, including drivers, trappers, dumpers, trimmers, motormen and brakemen, but only those who are directly connected with the movement and handling of the coal.

D. The cost of all other labor (such items as may be dispensed with, even if only for a short time, without interrupting the movement of the coal)—trackmen, timber men, road cleaners, brattice men, ditchers, electrician's help, etc.

Eliminate the last division (D) and dispense with all employees classed therein—what would happen first and what would be the ultimate result? Every superintendent has his own problems and his own opinions, and the answer would be different in many cases. The following order of events may serve to approximate the happenings in some mines:

1. One miner goes home for the want of a crosscut turn or switch.
2. Another cannot work because of a fall in his working place.
3. The lack of a brattice on one of the headings prevents its working.
4. A bad piece of roof along the heading cannot be timbered.
5. A loaded car off the track and nobody to help replace it.
6. Mining machine broken, pump grounded, motor armature burned out—no electrical help.
7. Headings gobbed, ditches choked and men quitting.

There is no economical argument in favor of permitting a mining plant to depreciate. To be efficient it must be in good repair in every respect. This article is a plea for better mining conditions at the same cost, which may be interpreted as meaning the same conditions at a less cost.

All the aforementioned difficulties and more are being met daily in different parts of many mines, and in many cases the work cannot be done promptly. Why not consider almost every item much on the same principle as we would the renewal of a pipe line some time next month or the month after, at an opportune moment when the work may be done economically—the same as the repair of a certain piece of machinery in a factory or the changing of a counter in a department store?

There would have to be an idle working place or two kept in condition for the use of miners who for some reason or other are unable to work in their own places. The idea is to get this class of work, or as much of it as is possible, done at a time when the mine foreman or his assistant can be there to see it properly completed, by some miner picked from that immediate section, allowing him the actual time consumed in the work or the estimated cost thereof.

There are many miners who would be glad of these extra earnings made between driver's trips or while waiting for the mining machine, without interrupting their regular duties. The individual, aside from his work at the face, has the means of increasing his income.

The same policy may be applied to most of the other happenings. It will be cheaper to pay some of the miners their just earnings for helping put a car on the track than it will be to bring the track or timber gang there for that purpose, and there is not nearly so much lost motion in its accomplishment. An extra mining machine, an extra portable pump and some spare armatures relieve more of the difficulties. Can you imagine the comfort and security the superintendent, foreman and electrician would feel in the fact that there was duplicate equipment on the job to meet the majority of emergencies? Under

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*Engineer of Mines, Flemington, W. Va.

such conditions the work could be done more efficiently and at a less cost.

If you do much writing you will probably have several pencils, all sharpened, so that when one becomes dull you can promptly pick up another. When you have a little time you sharpen them all or all that need sharpening. Your mine men have to repair their equipment (sharpen their pencils) after work hours or hurriedly during the operation of the mine in order to lessen the delays as much as possible. They work under difficulties, interruptedly, and your force has to be greater to meet emergencies. There is no legitimate reason why a great deal of this class of work cannot be done under favorable conditions and at an opportune time, properly and carefully.

A Record of Work Accomplished

Examine your day force critically—every one not directly connected with the movement of the coal. What are they doing and what percentage of their time is actually consumed in their work? The foreman will tell you they cleaned up a fall on a heading, put a turn in a crosscut, fixed a piece of track and finished out the day in a certain ditch.

Can you imagine any more ineffectual method of accomplishing this work? How much time is spent in movement from one place to another, changing tools or in the interruption of one duty to perform another of more importance, and how much in simply finishing out the day? What is the most economic way of doing each and every item that is to be done, considered separately? These are questions for the management of every mine, and each item of work should be taken up independently and its performance and completion provided for irrespective of interruption.

Should a pump break down you would not deliberately send for the maker to come to fix it. His entire interest would be to put in as many repair parts and as much time as possible, without being sure the parts and work were necessary. Yet on a bad piece of track the same track gang that miserably laid it returns to make the repairs, and their entire interest is to continue the repairing, for therein is their daily bread. It is to the interest of the driver to tear up a piece of track by derailments for his "buddy" the track man to fix; the miner to produce a fall for his cousin the slate man, or to break his roof for a friend the timber man.

By the elimination of the employees listed under division D the bare operating costs show a surprising reduction. There is work along the track or in the ditches that needs attention, and the foreman has a notebook in which these are listed. A small percentage of the mines work every day, and on the first idle day he has an opportune time to cross several from his list. The labor has cost him a minimum and is properly done under his direct supervision.

It is a common fallacy among operators to "cut" everything off during an idle day or two in order to economize. They are practicing the most expensive method of operating. When the foreman's attention is engrossed in his necessary and profitable duties of getting the coal over the tipple he is flooded with an abundance of labor in ditches, timbering, track laying and bratticing, to idle away time in a crosscut or hide in the air course. When the mine is idle and he has the time to attend to these labor expenses, his hands are tied; the money has been spent and little has been accomplished.

The ideal condition of eliminating all regular employees listed under division D may never be fully reached, but the closer they are approached the more will be the economy, the better the conditions and the closer will we reach the coöperation of all employees for their own and the company's advantage.

In experimenting with this system one noticeable advantage is the tendency to do each job thoroughly and completely. Gradually the foreman and his assistants are working their way out of the usual mining difficulties and their troubles are diminishing.

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Western Coal-Rate Advances

By H. S. Mikesell*

The Western rate situation, so far as it affects Illinois coals, is still receiving considerable attention. It is now definitely understood that the advances will be checked in by all the lines interested and will become effective probably Sept. 30; but if not then, certainly on Oct. 30.

Officials representing the southern Illinois carriers express themselves as feeling reluctant to take this step and are greatly disappointed over their failure to secure additional revenue on livestock and packing-goods products. Some of them intend immediately to petition the commission for a rehearing on these items, and if necessary they will consent to reopen the whole case on all commodities. To be consistent, they must of necessity show evidence of their intention to avail themselves of the relief previously granted by the commission by actually advancing the rates on coal.

Some of the roads intend to attempt to secure a continuance of present rates on fine coal—that is, Nos. 2, 3, 4 and 5 washed sizes and screenings. The Illinois operators have been asking special consideration and protection on these sizes, which become the maximum burden at the time that the advances go into effect.

It is not unlikely that if a rehearing on the 5-per cent. case is denied, or if additional hearings are granted and further awards made on the other commodities, some of the roads may feel warranted in reëstablishing the old rates. The situation is still involved and full of complications, but inasmuch as considerable tonnage originates at southern Illinois mines it is apparent that it is the purpose of some of the carriers not to jeopardize the movement of this tonnage at the new rates.

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Wanted--An Engineer

Important and responsible mining interests wish to employ a safety and efficiency engineer who is thoroughly experienced and fully acquainted with general mining conditions in the United States. The man desired must be entirely familiar with all devices of life-saving practice such as are adapted for the prevention of accidents in and about mines.

Anyone who feels qualified to make application for this position should write to the Editor of *Coal Age,* stating briefly his experience and training in the lines designated. All applications will be kept in strictest confidence and will immediately be sent to the people desiring such a man.

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*139 West Van Buren St., Chicago, Ill.

Distinction Without Difference

A competent man, an auditor, recently resigned from a company with which he had been associated for a long period of years. A friend, surprised at his action, asked him his reason for leaving.

The reply was brief, but seasoned with wisdom and to the point.

"I was in the wrong end of a good concern and I wasn't paid for my work like the fellow in the operating end. There was nothing ahead for me."

The man who asked the question—and who, by the way, was the president of a coal-mining concern—was struck by the answer, for he knew from experience that correct principles and practices in accounting are just as essential and worth as much to the life and future of a coal-mining company as a good engineering and operating organization. It was not long before his own auditor received a raise.

It is to be wondered why so many business men of sound judgment as to the selection of coal fields, markets, operating organization, etc., will so often give the accounting side of their business venture but little thought. They seem to forget that the very life of the concern must and does depend on whether it is conducted along sound accounting lines. How many coal concerns have gone to the wall because no provision was made in the accounting methods to provide properly for depreciation or not at all for extraordinary contingencies, such as fires, floods, strikes, explosions, etc.!

The trouble seems to be that a distinction has been created and a line drawn as to the value of operating methods and men as compared to accounting men and methods, as if there was a great gulf of difference between them, when as to their importance in the successful conduct of any business there is none.

Ask any live manager of nearly any coal concern if the cost sheets he looks over every month, and from which he figures what he can sell his product for, really represent all the cost. If he's honest he will tell you "No." With all his business acumen he is deliberately pursuing a course that he knows is wrong.

Why does he do it?

Because he too is in that rut of thought which draws a wide distinction between the value of sound accounting methods and principles as compared to the side of his business that is all action and filled with tonnage figures. This blinds him to the true value of the quiet accounting end of the business.

Coal-mining men especially have got to cut corners pretty fine to keep up with the procession. That they are so often misnamed "barons" is, more than anything else, due to the fact that neither the owners, stockholders nor the public have been taught that it is proper to pay a greater amount of attention to correct balance sheets than to total tonnage figures.

Too often a man with a coal mine is like a man with an automobile—he is considered well to do when really he is anything else.

It is time we began to quit drawing distinctions when no difference exists. When we adopt such a policy, the right kind of auditors will be greatly in demand and will be paid in proportion as much for their work as managers and superintendents are paid for theirs.

Pages from a Miner's Notebook: Efficiency

Efficiency, to the modern efficiency engineer, is the means to an increased production with the same number of men in the same, or less, time. To me efficiency is summed up in doing my day's work well, or even a little better than yesterday, with the least possible expenditure of energy and exertion. I spoke of this today to two of my fellow-workmen.

One of them laughed. He is a big, burly Italian who works in the next place. I hear him all day long rushing about, humming or singing snatches of song in his native language—now here, now there, always in a hurry and fury of endeavor. He is a good workman, and works very hard. Digging a little coal here this minute and the next running across the room to dig a little there; pushing his cars to the face on the run almost; loading them in record time and dropping them to the turn; carrying up his timber as he needs it, dragging in his rails, rushing for his track hammer over there and his spike bar and bucket of spikes elsewhere—using brute strength in his every action and accomplishing his day's work in good time and in good form. He earns as much as I, probably more some days, and his place is a model of safeness and neat workmanship.

My other friend nodded his head thoughtfully. He is a young German, not many months from the Fatherland. His place is some little distance from me, yet occasionally I find time to drop in on him. I enjoy his frank criticism of our methods of mining and our customs in general. He never seems busy. Always cool, always in action and making every motion lead naturally to the next, he loads his turn with seemingly the least possible exertion. He has coal dug and laid by and when not at other work he is in the cut, always working ahead, always paving his way to a better day's work tomorrow.

His timbers are all put into the cars he pushes to the face; and he always has a few in readiness. His rails are brought in in the same manner. His ax and saw and measuring sticks are always together in a convenient place, and his track tools are seemingly inseparable. He does not sing, but his cheery low whistle is always to be heard. His day's work accomplished—as much and as well as my neighbor's—he comes out of the pit with shoulders back and head erect, always ready for a friendly tussle or a frolic, and with, I imagine, a sense of accomplishment equal to that of the man who laughed at my idea of efficiency.

There is little difference in their earnings. They have each done a good day's work. Yet one of them is a better workman. Which?

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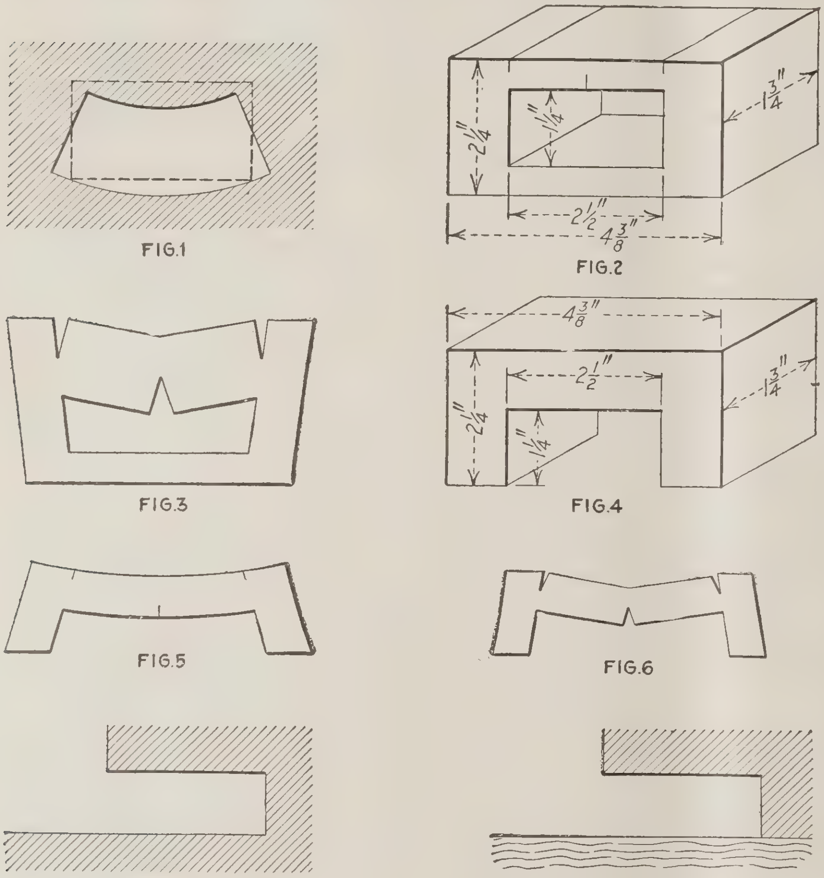
Cleaning a Centrifugal Pump—At the Johann Deimelsberg mine, in the Werden district, Germany, a centrifugal mine pump, which had to raise 6 cu.m. of water per minute to a height of 250 m. worked under considerable disadvantage on account of mud clogging the pump. In order to prevent this deposition, the following plan was adopted: After the centrifugal pump had been stopped the slush which collected in the pump was drained and clear water substituted, 1½ to 2 liters of mineral oil was added and the pump put in motion and worked in dead water for a few minutes. Water and oil were thus mixed and all the internal parts of the pump wetted with the oily water. After the pump was stopped again, this oily water was allowed to remain inside the pump until it was put in use again. Since this process has been followed regularly the clogging has ceased and the pump can be used steadily and with very little attention.—"Mexican Mining Journal."

Stresses in the Mine Roof*

By R. Dawson Hall

SYNOPSIS—There is a regular procession of collapses in the mine roof, and there are new structures resulting from each collapse. The failure of the roof is progressive. From its first condition as a holoid, it becomes in turn a pyoid, a cumoid and a conchoid, and then fails completely

The stresses in the simplest structures are often those which we find most difficult to analyze. Thus the most complex condition in mine stresses is found in simple tunnels where the roof, the sides and the floor are a monolith. The functions of the parts are like the parts themselves not distinct and specialized, and the problems to be solved are largely indeterminate, like those in a metal structure with riveted joints or a redundancy of bars.



FIGS. 1 TO 8. ILLUSTRATION OF PRIMARY ROOF STRUCTURES

Fig. 1 shows in broken lines a cross-section of a tunnel, and in full lines the same tunnel distorted by pressure. This is a typical holoid structure. Fig. 2 shows a soap model to which reference is made in the article. Fig. 3 exaggerates the upper or roof bar in the soap model and shows how the collapse of the roof forces back the sides by the arch action. Fig. 4 shows the soap pyroid without load. Fig. 5 shows the same when the bending of the roof bar takes place, thrusting out the ribs, or legs. Fig. 6 shows a further action when the revolution of the segments in collapse tends to force back the upper parts of the ribs, or legs. Fig. 7 illustrates a semiholoid structure. Fig. 8 illustrates a semipyoid structure.

This difficulty explains perhaps why the condition has not been treated. But just because it cannot be discussed in its entirety is no reason why it should be regarded as an action of parts with specialized functions as if the structure treated were a roof beam with independent supports resting on a detached foundation. The problem cannot be ignored on the ground that it is not of sufficient importance to warrant careful consideration, because conditions of complete monolithism, of which the tunnel is the type, are found materially unchanged in room-and-pillar and in longwall work.

Holoid or Truly Monolithic Roof

This unity between roof, sides and floor, which to the coal miner is a difficult conception, really deserves a scientific appellation, and perhaps holoid (from *holos,* whole, and *eidos,* form) will serve the purpose as well as any other.

In a simple tunnel the roof, the sides and the floor form integral parts of one and the same structure, and the distortion of one cannot be conceived without a consequent strain in the others. Thus when the roof of the tunnel droops by reason of its weight, the upper parts of the sides are drawn in because they are integrally connected with the roof and must approach each other whenever, by the sagging of the roof, the distance between any two points in it is diminished (see Fig. 1).

The sides in their turn operate on the floor of the holoid structure, producing a tensile stress. The value of soap as a means of illustrating the action of mine stresses has for a long time impressed me. With that idea in mind a cake of naphtha soap measuring 4⅜ by 2¼ by 1¾ in. was taken and a rectangular hole representing a tunnel was made through it 1¾ in. long, 2½ in. wide and 1¼ in. high (see Fig. 2). A load was then placed at the mid-span of the tunnel. Eventually, the upper bar, or "roof," broke at the center line and along both "ribs" of the tunnel, the breaks being approximately vertical and proceeding, as might be expected, on the ribs from the "surface" downward and at the center line from the tunnel upward, the failure being from bending moment, not shear.

This is interesting because it shows that breakage *at the ribs* is not necessarily evidence of shear. It may be only a demonstration of a holoid structure. It is the form of failure whenever coal is blasted down and not an infrequent form of roof demolition. The test on the soap tunnel further showed that as soon as rupture takes place in the roof of the tunnel, there must inevitably come a thrust on the ribs. The tension draws them together till rupture occurs and then the two roof units, in endeavoring to revolve, crowd each other and push on the opposing walls (see Fig. 3).

When a holoid structure, by reason of the weakness of the floor or because of a lack of adhesion between the ribs

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*Article presented at the San Francisco meeting of the American Institute of Mining Engineers, September, 1915.

and the floor, ceases to engage the floor in its movements, then its shape as a structural element roughly resembles the Greek letter π and for want of a better name we might term the new element a pyoid structure (see Fig. 4). The doctors use the word for a totally different purpose with little excuse. "Pyonoid" is the word which they should use to express the attributive "pus-like."

By reversing the soap tunnel after the roof has been caved the weakness of the pyoid structure is made clear. As soon as pressure is brought on the new roof (formerly the floor of the tunnel), the two ribs are seen to recede markedly and it is evident that when the floor is intact there must be a well-developed stress in that element of the holoid structure (see Figs. 5 and 6, showing progressive demolition).

Probably it is well here to express a belief in the importance of the holoid. The general notion is that all the beds shear horizontally along the lines of stratification and that it is a mistake to consider the mine or even the roof as a monolith. It is true that most of the accidents in mines are due to the lack of unity in the roof. What we call draw-slate accidents are almost wholly due to this fact. Nevertheless, it is interesting to note how firmly roof and coal are usually "burned" to one another. Even when undermined and sheared on both sides the coal often fails to fall, being supported by the vertical shearing strength of the one side still attached and by the adhesion to the roof. I am hardly prepared to state when the holoid structure ceases to exist, and of course the time of its occurrence and the conditions under which it will develop vary with the materials under consideration.

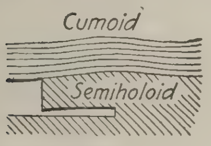

FIG.9

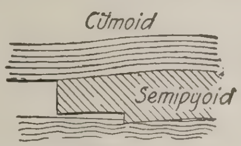

FIG.10

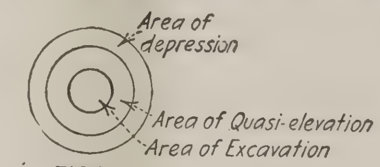

FIG.11

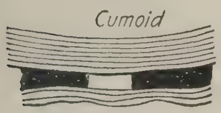

FIG.12

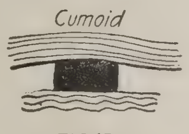

FIG.13

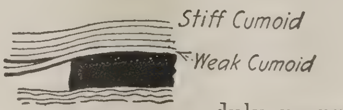

FIG.14

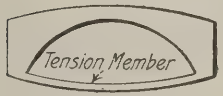

FIG.15

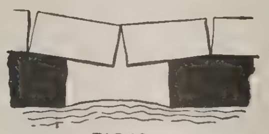

FIG.16

FIGS. 9 TO 16. SHOWING LATER STAGES OF DEMOLITION

Fig. 9 shows a semiholoid such as often occurs in longwall, supporting a cumoid which, being separated from the semiholoid, has freedom of movement except for the restraint of frictional contact. Fig. 10 shows a semipyoid likewise surcharged by an independent cumoid. Fig. 11 is a plan of a circular excavation. The sagging of the roof into this area produces an area of quasi-elevation; that is, an area which would be elevated if the mineral itself and the floor surrounding the excavation were incompressible and indestructible. Outside this area is one of depression, the stiffness of the measures lightening the burden on the area of quasi-elevation and loading with increased heaviness the edges of the excavation and the area of depression. It exhibits the fact that the action of the roof is cumoidal, or wavelike, and not confined to the area of excavation. The depressed area is in its turn followed by another area of quasi-elevation, and this again by an area of depression. The size of these waves of course decreases as the area of excavation is left behind. Fig. 12 shows a cumoid bending over an opening and crushing two pillars. Fig. 13 shows a cumoid bending over a pillar, the center of which is a point of quasi-elevation. The roof tends to break over such a support. Fig. 14 shows a weak cumoid, such as a loose draw slate which has broken away from the stiffer cumoid above and probably has insufficient moment of inertia for self-support. Fig. 15 is a Luten bridge, showing the lower tension member, or paving, which ties the abutments together and prevents their recession, thus adding to the strength of the bridge. Fig. 16 shows a broken cumoid failing to fall owing to an arching action.

How Holoid Stresses Tear Slabs Off Ribs

It is obvious that with the holoid structure, the ribs being drawn together by the movement of the roof, they must tend more or less to be split vertically and in longwall they will then fall down on the advancing undercut. In certain sub-bituminous mines I have noted a tendency toward what I thought was a vertical shear parallel to the headings. This developed rapidly after the work was opened, especially at great depth.

Whether this was only a vertical shear seems doubtful. It may have been due to the holoid character of the structure, the ribs receiving no relief by a horizontal shear between ribs and roof. Instead the roof pulled off the edge of the pillar as the former bent under the load. It was interesting to note that these lines of fracture did not coincide with the normal cleavage of the coal.

The rending along vertical planes eventually throws back the real rib lines far into the pillar. Where the draw slate and roof proper leave one another, we have probably a plate structure superposing one which is holoid or pyoid in character, and in the longwall the breaks back of the face which bring coal and roof down together. or which tend so to do if the latter is not duly propped, are failures of the semi-holoid or semi-pyoid and not of the plate structure above (see Figs. 9 and 10).

Roof Crowds Between Ribs and May Not Fall

The breaking of even the holoid roof is not necessarily a sudden, unheralded event, such as one might anticipate from a cursory consideration of the problem. It is clear that the action of the moments cannot destroy the roof without revolving in a degree the elements into which the roof is broken, and any revolution inevitably binds these elements against one another so that they are less able to fall. Either a recession of the ribs or a further demolition of the revolving elements must take place or the roof cannot descend. One form of demolition which frequently occurs in shallow workings is vertical shear extending the cracks already made by the bending-moment stresses. But horizontal shears may make it possible for the roof masses to revolve and yet fit the space they occupied by a counter revolution of the strata past each other. Or again, the whole mass may be broken up by the rubbing of the opposing faces of the elements as they try to fall.

It is this last action which is in evidence in coal brought down by a shot when it is broken considerably in falling, and that vertical shear is not an important cause of the fall of coal is shown by the fact that there is a distinct tendency for the coal to roll away from the side ribs.

It is necessary now to consider the plate structure in which the roof is considered as a vast plate, a monolith in itself but resting without adhesion on its supports. Whenever there is a mined area the roof is depressed, and being elastic it tends to rise on the surrounding supports, resting its weight on the edges of the surrounding ribs of the excavation. This area of quasi-elevation is followed by another area of depression surrounding the central depression and the area of quasi-elevation. Thus the roof plate is bent into a series of waves around the central area of disturbance just as the surface of the water is rippled round the point where a stone has fallen and disturbed its equilibrium (see Fig. 11).

Of course, the elevations are only relative, not actual, and naturally, like all undulations, as they recede from the point of disturbance they die down. But it is essential to remember that while the holoid structure is to a large extent a closed force chain, this is not nearly so true of the roof plate, the stresses in which are less localized and circumscribed.

The Cumoid, Wave-Like or Plate Structure

This structure we may dub as cumoid (from *kuma,* a wave). The remarkable feature about such a structure is that it develops points of great stress far away from the disturbing cause, and it may break over the pillar instead of in the opening. The appearance of the Forth Bridge, Scotland, is known to almost everyone. The light structural work over the midspan contrasts most forcibly with the heavy structure over the piers. It is the case with all cantilevers and continuous-arch structures, and the roof in the mine is like a continuous arch, only it is continuous not only in one, but in every direction.

It is the peculiarity of the cumoid structure that the stresses it involves may be greater farther from the point of disturbance than at some nearer point. But, like the holoid structure and the pyoid, it puts the greater burden on the pillar's edge. The center of the pillar between two large open spaces may be relieved from much of the normal pressure because of the bending of the cumoid roof over the pillar (see Fig. 13).

There is some evidence that in actual operations in some sections of the country the roof soon breaks by horizontal shear into two or more separate cumoid structures, of which of course one is free of external load, while the others, though below other cumoids, may or may not be loaded over the unsupported area. If the stiffness of the upper cumoid, or cumoids, exceeds that of the lower, the loading may be relieved from the open spaces and the upper cumoids may restrain the lateral, and therefore the vertical, movement of the lower cumoids, thus adding to their resistive strength.

Reasons Why Roof Failure May Spread

In an interesting paper read before the winter meeting of the West Virginia Coal Mining Institute, the late F. C. Keighley called attention to the fact that when the lower roof broke or was preparing to break in the mined spaces of the Connellsville region it frequently weakened the lower roof in the rooms and headings nearby, despite the strong support afforded by large pillars. This caused in the narrow places many falls which had to be loaded out.

It would seem, therefore, that the breaking of the lower roof or its initial stressing tears the lower roof from the upper and from the ribs, converting it into a cumoid structure which is too weak to stand the strains to which it is exposed. In cases, however, these primary failures may be due to substitution of a pyoid for a holoid structure. For it must not be forgotten that where the bottom, ribs and roof are one and indivisible, the floor is an element of strength and prevents the roof from breaking. Just as the lower flange in a rail helps the ball of the rail to support the weight, so does the floor help sustain the roof so long as the former is unbroken.

One of the patented features of the Luten bridge construction is its holoid structure. Luten does not use the term, but nevertheless the construction is closely analogous to the structure I have been describing. Luten builds not one bridge but two, one for vehicles to pass on and one termed the stream pavement to bind the feet of the piers together so as to form a perfect holoid. Destroy the lower bridge and the upper or traveling bridge is in a precarious condition (see Fig. 15).

The holoid structure gives the strongest of roofs; the pyoid is less strong; the cumoid is still weaker. Every horizontal shear makes the roof progressively less stable. Strange to say, vertical cracks permit the replacement in many cases of a less stable by a more stable structure. The fractures in a vertical direction, which would ordinarily be thought more detrimental than those in any other direction, prove not unimportant, it is true, yet in a way strengthening.

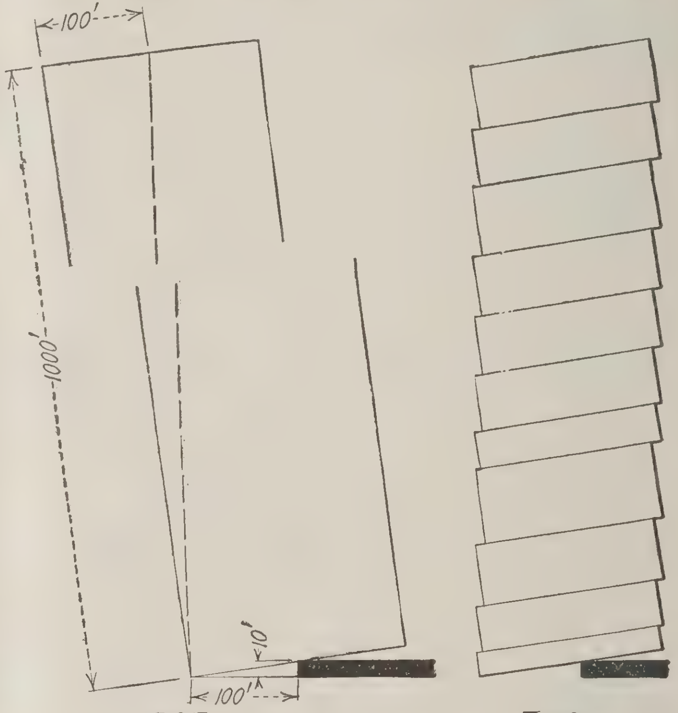

FIG.17 FIG.18

FIGS. 17 AND 18. SHOWING HOW DIFFICULT IT IS TO DESTROY A CONCHOID ROOF STRUCTURE

Fig. 17 shows the large amount of displacement needed to permit the unbroken fall of one leaf of a conchoid, or broken cumoid, 1,000 ft. deep. Fig. 18 shows how the needed distortion is secured by horizontal shears at places of weakness.

The Conchoid Is the Last Resistant Structure

When a cumoid of great depth finds itself inadequate to its own support as a cumoid and begins to rend vertically from the surface downward to its supports and upward from the span centers to the surface, then the cumoid beam becomes an arch, and the cumoid plate becomes a dome and until it fails in its new structural relations, it cannot continue to extend those rents which threatened its stability. Let us say that the cumoid has become a conchoid (from *conchus,* a shell), the lines of stress forming figures resembling one shell of a bivalve.

As the elements of which the roof consists crowd each other into the opening it is impossible for the roof to rupture or fall until the various strata cease to act as a unit and begin to slide past each other (see Fig. 16). If we imagine an element of rock stretching from a rib to the half span, a distance, let us say, of 100 ft.; if we further suppose the excavated coal or other mineral to be 10 ft. thick, and regard the rib, floor, and falling-rock element to be so adamant that none of the three will crush, heave or bend, then the inclination of the element when one corner reaches to the floor will be 10 per cent.

If the excavation is 1,000 ft. below the surface, the displacement of the block at the surface would have to be 100 ft. (see Fig. 17). At a greater depth the displacement would be more. It is needless to say that such an elbowing of the adjacent rock masses cannot occur even where the crop, broken roof, or the sags in nearby workings make a certain amount of lateral adjustment possible. But horizontal shear along weak planes, such as beds of clay or coal or stratification planes, will permit such a number of readjustments in the element of rock itself that it will be able to come down. It will, in fact, only *tend* to tilt; it will not actually upset forward as this would involve too many other changes (see Fig. 18).

This, then, is how the end comes unless the rock is too strong to shear horizontally. Subsidence ceases when the required deformation has taken place. The choking up of the falls probably has but little to do with the final result, though it may have its effect in some cases. In fact, the theory as given is comforting to the conservationist, as the beds above the one extracted suffer but little, being exposed only to the horizontal shearing process, which is by no means destructive of the integrity of the measures.

However, the rupture at the half span may often result in falls of moderate size at that point, for when the monolithic roof is weakening by successive horizontal shears, we have a series of superposed cantilever cumoids entirely unequal to the task of self support. If the action which forms these cumoids does not let them all down to the floor suddenly, they will be sure to fracture successively from the bottom upward, and such seams of mineral as partake of this independent action will be destroyed.

⁂

Extracts from a Superintendent's Diary

Everyone who reads the daily papers can know that in most coal-mining districts the companies that own the mines also own the houses in which the miners live, as well as the commissaries from which the men buy their supplies; and knowing that, it is so easy to assume that the mining companies come pretty near to owning their employees, body and soul. The fact that in most cases the company has no alternative in the matter of owning its entire camp is never taken into consideration.

I have just gone through an experience which has made me realize that the owning of the houses and commissary by an operating company does not necessarily enable the company's superintendent to regulate the domestic affairs of the employees in an arbitrary manner.

About three weeks ago one of our assistant mine foremen lost his life, probably because of his own carelessness; still he had been attending to his duty and had gone about it in a conscientious way. Under the circumstances every one felt very much distressed by the accident, especially because the unfortunate fellow had always been a faithful worker, loyal to his company and solicitous about the welfare of his subordinates. A week after his death I took the matter up with the company's casualty department to see what could be done for his wife and children. It is reported that, according to the evidence, the company's liability would be hard to establish, but it would waive this advantage and permit me to offer the maximum sum allowed by the company for settlement of cases out of court.

I felt sure that the widow would be governed entirely by my advice and so I hesitated about laying the matter before her and finally decided to talk the proposition over with her two brothers, who had come into camp to assist her.

They laughed at my offer and intimated that they would like to see any company beat their sister out of her rights by compromise.

Of course I felt very much put out in having my good offices misconstrued and repaid by insult, but because of my affection for the dead man I overlooked that and decided to await developments.

They were not long in coming.

Yesterday one of the brothers came to my office to inform me incidentally that he was leaving, but he managed to tell me that he had advised his sister to remain in possession of the company house and to trade at the company store until her rights could be decided by the courts, and in the meantime if anyone attempted to oust her from the house, or if the company refused to supply her with goods required from the commissary, she was to go through the camp and impress upon all the inhabitants what a soulless company they were working for.

What an unpleasant predicament.

Undoubtedly the brothers have made the widow believe that it is the company's duty to allow her to remain in the house and supply her from its commissary until the court gives her satisfaction, and if I should attempt to acquaint her with the actual facts in the case she would decide that I was trying to take advantage of her. I would rather pay her house rent and her grocery bill indefinitely than to attempt to persuade her that she ought not to follow her brothers' advice, and yet if I should allow such a precedent to become established my usefulness with the company would soon come to an end.

It's just another instance illustrating the crying need of an adequate and universally accepted liability law.

⁂

Speaking as an Inspector of Mines, R. Donald Bain expressed himself in favor of compulsory watering. Referring to an accident in his district (Durham, England), he said that if the regulations as to watering had been carried out there would have been no explosion at all. On this point British mine inspectors are constantly remonstrating. Their remonstrances have had some effect, and there is also a tendency to understand the dangers of dust more than there used to be. "Wet zones" have been proposed and provided, and in the view of Mr. Bain it is possible that if an explosion occurred the area of it would be limited by their action. Most haulageways can be watered without interfering very much with the roof and floor, but where there is a great difficulty in watering these haulage-roads and where they can only water here and there it would be desirable that the types of cars used should be such that the dust could not easily escape, and even then the cars should be watered in order to prevent the scattering of dust.

⁂

The Tensile Strength and Elongation of Copper Wire varies considerably with its size; annealed soft copper wire ranges in tensile strength from 30,000 lb. per sq.in. in the coarser sizes to 42,000 lb. in the fine sizes. Hard-drawn copper varies in tensile strength from 45,000 lb. to 68,000 lb. per sq. in., according to size. Moreover, a solid unstranded copper wire of larger diameter than 0.46 in. is hard to splice.

The Labor Situation

SYNOPSIS—Under pressure from labor leaders the tridistrict convention makes fewer and less stringent demands on the operators than did the Scranton miners. The check-off will not be demanded in the anthracite field. West Virginia operators will have to pay an increased freight rate of 15c. per ton. The Hocking Valley operators hope to secure concessions which they claim are needed if they would compete with the eastern Ohio field.

On Tuesday, Sept. 7, the miners' representatives of all the districts in the anthracite region, Nos. 1, 7 and 9, opened their tridistrict convention. The meeting was held in Hampton Hall, Wilkes-Barre, Penn., nearly 450 delegates assembling. The expenses of the meeting will be large, each delegate receiving $3.75 per day. Some have even estimated a total cost of about $4,000 for each day the session continues.

To guide the convention were the resolutions passed at the meeting of the delegates of district No. 1 in Scranton on July 19 and recorded on page 174 of the issue of "Coal Age" of July 31, but the pressure of the labor leaders, especially of J. P. White, the president caused a slight modification of the demands. These are still unreasonable, but the miners' claims as usual must not be regarded as ultimate; they are purely haggling proposals to be modified later, and they are only made large in order that the miners may be thought reasonable by the public when they surrender some of their demands. "Look," they will say later, "how much we have conceded."

Report of the Anthracite Scale Committee

There were fifteen men in the scale committee, five from each district. Reese L. Morgan was chairman and C. L. Brislin, secretary. The demands were as follows:

(1) The next contract shall be for a period of two years, commencing April 1, 1916, and ending Mar. 31, 1918, and the making of individual agreements and contracts in the mining of coal shall be prohibited.

(2) An increase of 20 per cent. shall be made on all wage rates now being paid in the anthracite coal fields.

(3) An 8-hr. day shall be granted all day labor employed in and around the mines, the present rates to be the basis upon which the advance above demanded shall apply. Time and a half shall be paid for overtime and double time for work on Sundays and holidays.

(4) Full and complete recognition of the United Mine Workers of America of districts Nos. 1, 7 and 9 shall be accorded.

(5) A more simple, speedy and satisfactory method of adjusting grievances than now provided shall be arranged.

(6) Contract miners shall be restricted to one working place.

(7) The selling price of mining supplies shall be fixed on a more equitable and uniform basis.

(8) All coal shall be weighed and payment shall be made for it on a run-of-mine basis, 2,240 lb. constituting a ton.

(9) The machine-mining scale shall be readjusted so that equitable rates and conditions shall be assured.

(10) The arrangement of detailed wage scales and the settlement of internal questions, relative to both prices and conditions, shall be referred to the operators and miners of each district, to be adjusted on an equitable basis.

Comparison with the Scranton Demands

As districts Nos. 7 and 9 do not meet before the tridistrict convention, and consequently have not so far met, it is of interest to compare the conclusions reached by this Wilkes-Barre meeting with those at which district No. 1 arrived in its July session. There is a significant omission in the first demand of the Wilkes-Barre scale committee. The delegates at the Scranton convention declared for "a recognition of our organization with the right . . . to provide a satisfactory method for the collection of its revenues." In short, the demand of No. 1 district was for the "check-off."

For some reason this has been dropped, but the miners apparently did not recognize, at first, that the demand for this privilege had been withdrawn. President White has declared, however, that no attempt will be made to secure it, as he does not believe it can be obtained and does not want to ask for more than will be granted. It is hard to believe that Mr. White could regard the check-off as any more difficult to obtain than some of those unreasonable demands which he could not induce the committee to remove from the scale demanded. He is surely not unwilling to tack on to his program so important an item for the perpetuation of the union. Only those who doubt the value of the union or its leadership or its right to the adhesion of all miners are opposed to the check-off.

There are, of course, several opposed to the deduction of money from the miner's pay for union dues. These people are dubious about the union and do not believe the miners should be compelled to join it; but surely J. P. White is not among these. It seems natural to suppose that he believes that the check-off, while not popular with the public as is the making of a bargain with the union and the 8-hr. day, will inevitably follow complete recognition and will be won without fighting when the operators have once made a contract with the union as an organization.

Wage Increase of 20 Per Cent. Demanded

The demanded advance in wage in the Wilkes-Barre scale is 20 instead of 25 per cent. The demands propounded by the Scranton convention made quite clear what effect the increase was to have on the pay of day laborers. They were to work 8 hr. for the price of nine and were to receive a further increase of 25 per cent. Their raise in wage was to be 12.5 per cent. per hour and 25 per cent. additional, which figures an increase of 40.625 per cent. per hour. If the addition is to be reduced to 20 per cent., then the increase for each hour is 35 per cent. The meaning of the Wilkes-Barre convention on this matter is by no means clear. It says "the present rates are to be the basis upon which the advance above demanded shall apply." It does not say whether the rate per day or per hour is the rate intended. If the rate per day, the day worker will gain in actual wage per day 7.67 per cent., which is a small gain compared with that of the miner, which is 20 per cent.

In any event the demand, if conceded, cannot fail to raise immensely the cost of producing coal. Mr. White said some time ago that the Delaware, Lackawanna & Western R.R. Co. was making 33c. per day clear profit off each of its men, and that 19c. of this was excessive. Assuming that this profit is typical of anthracite corporations, which it is not, the increase would far more than wipe out the portion of the dividend regarded as unfair, and in fact the entire dividend, even if the lowest interpretation is put on the contract offered by the Wilkes-Barre convention. The miners are evidently looking not to the companies but to the public for their increase. That may be perfectly permissible, but it is not right to declare that the companies can pay it out of present prices.

Still the large concessions demanded of the operators—or should it be the public?—are not satisfactory to the Schuylkill delegates, who believe that in view of the many dangers to which miners are subjected the pay should be larger.

Miners Will Now Discuss Matters with Operators

The committee of miners who will meet the operators is clothed with power to negotiate the best contract possible. This will be submitted for the ratification either of the local unions or, if Mr. White has his way, to a tridistrict convention as in 1912. But the meetings will not be started till about February, when the Indianapolis convention has concluded its sessions.

It is difficult to say who will lead the operating concerns. George F. Baer, when living, undertook that responsibility. It is thought that Col. R. A. Phillips will be selected this year; but it is hardly probable that there will be any recognized leader. Colonel Phillips is hardly a proper selection, as his arguments are weakened by the fact that his company has been more successful than any other in making large dividends. The Philadelphia & Reading Coal and Iron Co.'s president could always sustain a better argument. The miners are trying to drive a salient into the operators' lines through the Delaware, Lackawanna & Western R.R. coal department's weaker defensive position.

It seems probable that if anyone is chosen to express the position of the operators, it will be E. W. Parker. It has always been customary in bituminous fields to select such an officer for negotiations of this sort, though as a rule he has been a recognized labor leader transferred to the operators' ranks for that purpose. A man as disinterested as Mr. Parker is apt to reflect the judgment of all companies concerned.

Many D., L. & W. Employees May Receive Back Pay

The Delaware, Lackawanna & Western R.R. coal department may have to pay $70,000 to $100,000 back pay to their inside, outside and assistant foremen, their driver bosses, firebosses, weighmasters, clerks and others. When the miners in 1912 secured their present contract with the operators a wage increase was provided of 10 per cent.

A short while before the contract was signed the salaried men were given a voluntary increase of $5 a month. They were not given the percentage increase because they were salaried men and the company took the position that they were not parties to the contract. The electricians, electricians' helpers and watchmen at the collieries objected to their being excluded from the increase. The miners took up the claim of these men and the conciliation board considered it. A deadlock ensued, and the case went to Judge George Gray, who decided against the company. The payment under this decision amounted to only about $5,000, but now all the other bosses are claiming under it.

An inside foreman, for instance, under the old contract got $120 a month. He now gets $125, but the award gives him $132. So he has coming due him $7 per month for 43 months or $301 up to Oct. 1. The lower officials will not fare so well, for $5 more nearly represents the whole amount of the increase they would normally secure. It is only on the part of their salary above $50 per month that they will obtain an increase if it is paid.

Railroad Rates Are to Be Raised 15c. in West Virginia

The Ohio coal operators have won a substantial victory in their fight against the unfair differential in freight rates that gave the operators in West Virginia a great advantage over them in the coal markets. The fact that the interstate railways in West Virginia, Pennsylvania and Ohio have raised the differential from 25c. a ton to 40c. is the biggest victory which has come to Ohio operators in many years.

Freight rates showing this increased differential will be filed with the Interstate Commerce Commission in Washington at once, and as soon as approved will become effective. The 40c. differential in favor of Ohio coal will be based on the rate to Toledo, and a proportionate differential will be employed for all other markets of the state.

This great boom to Ohio operators came as a result of a conference between the Interstate Commerce Commission and the executives of the coal-carrying roads affected, which was held in Washington during the week. M. J. Caples, vice-president of the Hocking Valley Ry., which is affiliated with the Chesapeake & Ohio Ry., announced the result of this meeting upon his return from the conference.

Coal operators are pleased over the action and predict the early resumption of some of the mines in the Hocking Valley and eastern Ohio districts. It is planned to get the miners back to work as soon as possible, so that they may have the coal ready for shipment when the new rate becomes effective, which should be within 30 days.

Hocking Valley Operators Seek Concessions from Miners

Equally important is the step taken by the Hocking Valley operators themselves. They have brought to the attention of the workers the reasons why, in their judgment, work has been suspended so long. The Hocking Valley operators ask that the same conditions be imposed upon them as are now in successful operation in the eastern Ohio coal fields. They hold that unless this is done the operators in the latter district will gain a stand which will be hard to overcome and may enforce idleness on the southern plants of the state. If the same conditions are adopted by the union men in the Hocking Valley, the operators claim that all the mines will be opened without delay.

They point out these features which are in force in eastern Ohio, but not in the Hocking Valley field: A definite list of holidays which the miners are permitted to observe; a series of regulations that materially aid in the production of clean coal and that provide fines for miners who fail to observe these rules; specified conditions for setting and resetting posts and the rates that may be charged therefor; provision that no strike shall be called for any cause other than a failure to pay wages, and that no mine shall close down on account of a funeral. Frequent holidays and funerals for many years have been the bane of operators.

Military Court of Inquiry in Colorado

A military court of inquiry is investigating the Colorado National Guard. It was originally appointed by the governor to inquire into the charges of corruption in that body and into the efficiency of Adjutant-General John Chase and other high officers in the militia, but its investigations have been greatly extended. It is endeavoring to discover the motives of those who brought the charges, and it has publicly accused President Wilson and national army officers of aiding the United Mine Workers of America to prevent the rehabilitation of the guard, and it has charged that the Federal investigators in Colorado have worked with agents of the United Mine Workers to the same end.

By order of the governor, Lieut.-Col. E. J. Boughton, president of the military court, and himself one of the officers named in the charges of corruption, has made public a statement that the court has obtained sworn documentary evidence of a conspiracy hatched by agents of the United Mine Workers to hinder the reorganization of the militia and to procure indictments, by misrepresentation, against Governor Carlson, Attorney-General Farrar, high militia officers and leading coal-mine operators and those who have financed them.

Boughton has also charged, on the authority of the governor, that the decision of the state Supreme Court, prohibiting Judge Hillyer from presiding over the trial of three miners involved in the strike, reached Washington 11 days before it was "handed down." This accusation attacks the integrity of the court or of some of its employees, or assumes the commission of a theft, and it is so grave a charge that it will undoubtedly be considered by the Supreme Court at its next sitting.

Union Denies Charges of Illegal Practices

William Diamond, organizer for the United Mine Workers of America, who is said to have succeeded John R. Lawson since the conviction of the latter at Trinidad, frankly admits through local newspaper interviews that the United Mine Workers has had detectives in Colorado gathering evidence on which to base criminal complaints against state officials and coal-mine operators. Only the agitated state of public feeling could distort such activity into an offense, provided the means by which it obtains the evidence it is seeking is wholly within the law.

Mr. Diamond emphatically denies that any of the detectives have worked with any Federal officer, or that the union has any interest in the National Guard other than that furnished by the fact that some of the guardsmen Mr. Diamond would have indicted and others he thinks are able to testify against those who are chargeable with violations of the law. The men the union would indict have so far not been named by Mr. Diamond, but it is believed that the campaign of retaliation is to be directed against John D. Rockefeller, Jr., and other "powers behind the throne."

Union Claims It "Framed" Itself

The United Mine Workers of America denies the force of the evidence obtained by the court of inquiry. It claims that the union officials knew that a raid was to be made on the offices of Major C. D. Elliott, one of the Mine Workers detectives. They accordingly placed a file of false correspondence for the express purpose of misleading the court; but the court in turn declares that this is only a futile effort to discredit the find.

Witnesses before the court have refused to testify, alleging that, the body being military, it has exceeded its authority in summoning civilian witnesses. Among these is Philip S. Van Cise, a former captain in the guard, but now chairman of the committee bringing charges against Adjutant-General John Chase and his lieutenants. Another recalcitrant is Major C. D. Elliott, former adjutant-general of the National Guard of Virginia and now "special agent" for the mine workers.

Van Cise was arrested by the court for refusal to testify. The governor immediately ordered his release pending the opinion of the attorney-general as to the court's jurisdiction in such matters. The latter stated that the court "should have the right" to summon witnesses, civilian or other, though it could not compel those it summoned to give testimony. Several subpœnas and one writ of attachment were issued forthwith. The latter was for the arrest of Major C. D. Elliott, but he had left for West Virginia. There is some talk of attempting to have him extradited.

R. W. Coates, chief of the numerous detectives in the employ of the United Mine Workers of America, has been subpœnaed, but habeas corpus proceedings will be instituted by the union should the court apprehend Coates, Elliott or Van Cise.

Van Cise declares that the charges brought by the committee were made solely in the interests of the state and for the betterment of the National Guard. He wants Chase ousted and a complete reorganization of the body for use in national defense only. He would have a state constabulary appointed to relieve the militia from service in industrial disturbances.

Editorials

Some New Aspects of the Anthracite Trade

The indications are that competition among anthracite shippers is going to be unusually keen this fall and winter. This is being brought about by the fact that many small mining operators who formerly sold their production to the larger mining companies are going into the market direct or changing over to some of the smaller sales companies. These changes have been making themselves felt all summer, and as the busy season comes on a still greater impression will be made.

There can be no denying that the individuals have grown and are equipped to offer both quality and service. They have been making their plans during the dull times and have been catering to the dealers, offering extra favorable prices and extended credits and giving appreciative attention to the smallest order. There is no doubt they have made many new friends.

Their sales forces are large enough to warrant weekly calls on all the trade, and because of this attention the smallest retail dealer has never been in such close touch with the market and in a position to ask more favorable terms.

The dealer who pays a price now without question is a thing of the past, and the feeling that the coal must be inferior on account of low price is also rapidly disappearing, for the very good reason that most coal reaching the market is being better prepared than ever before.

It goes almost without saying, though, that the big companies will make determined efforts to regain lost tonnage and also get new business. For this reason it will be interesting to note developments.

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The Stresses in the Mine Roof

In this issue under the above title an article is reprinted extending the theory of roof demolition. In previous contributions to technical journals and societies the author of that article has kept in mind only the later stages of roof breakage and has overlooked the fact that when a tunnel is driven into a hill the roof is integral with the ribs, and the latter is a unit with the floor. He shows in this most recent publication that it is impossible to treat them apart in the same manner as we would the roof, the walls and the foundations of a house. They must continue to be treated as a whole until in the process of demolition they are parted.

Thus it appears there is a progression in the action of the mine roof which is marked by those rendings which the miner has long since ceased to fear but which are so trying if not terrifying to the tenderfoot.

It may be doubted whether the writer of the article is justified in adding to our already overloaded dictionary and in giving us a new meaning to the old word "pyoid." For holoid, "tunnel structure" would be a satisfactory equivalent; cumoid, could be safely translated into "plate" and a conchoid would be just as intelligibly described if designated as a "dome."

The idea of a pyoid is harder to convey by ordinary words than any of the others. It is hard to find a name which will not create more fallacious interpretations than true ones, unless we use some other word like "pylon," which is for the mining fraternity as hard to comprehend as pyoid and which is not a perfect analogue even then. Perhaps those who like our mother English as she was before the days of Lyly will prefer to call the pyoid an "n" structure, for after all an "n" is not so far removed in appearance from the actual condition.

However, coined words have their value, because they are supposed to convey only the ideas the coiner places on them. Strict etymologic truth is not demanded in making such names, and once coined they pass as if they were exactly specific, though like copper coins they fail to weigh enough as raw material to justify their recognized evaluation.

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Unsettled Conditions in the Hard-Coal Business

While the individual anthracite operators market approximately one-third of the production, it is not customary for them to issue a price circular. In this respect they depend on the large companies which for years have issued circulars at regular intervals, and it is these circulars that the individual uses as a basis for his sales. When there is a brisk demand for coal it is not difficult to maintain the circular, but in times of a dull market extraordinary activity of some shippers to get their product to a market has a most disturbing influence on prices.

The one vulnerable spot, which has always been assailed by the individual, is the contract system of selling coal by the large operators. It has been the custom for many years to enter into contracts with extensive users of steam coal, covering their requirements for an entire year. In case the market price should fall below that agreed upon in the contract, the buyer without question receives the benefit of the falling market and when the price rises he is still protected. Furthermore, the buyer is not obligated to purchase the tonnage agreed upon in his contract. Violations of contracts have been especially numerous this year, the consumer buying from the individual at a lower figure than his contract. As a result the large companies have sat idly by and watched a large proportion of their steam tonnage drift away from them, and they now have large stocks of the steam sizes in storage.

It is not to be supposed that the large interests are entirely dormant; as a matter of fact, they have merely been tolerant. It is now rumored that one of the very largest companies has about decided to take a very aggressive stand in the matter of securing and holding their tonnage. It is hardly probable that the method to be pursued will be one of meeting fire with fire, as the big companies are too experienced to engage in a price war.

They could, of course, exert a tremendous power if they determined to right the market by a price-cutting campaign. Naturally, the cry would arise from the small shipper that the large producers were trying to eliminate him.

It is quite likely that aggressive action on the part of any of the larger companies has been delayed simply because of the many false impressions that would spread. Aside from this, the companies have been continually harassed by the Government during the past ten or fifteen years, with the end not yet in sight. Much of this opposition has been traceable to individual interests claiming to have been injured by alleged unfair practices.

If outward appearances count for anything, the individuals have prospered under the present system. Many companies which a few years since were occupying very little office space and had small forces to market their output are branching out by taking large suites of offices and employing new salesmen. It would seem to be wisdom on the part of the individual to realize that with his large aggregate tonnage there is a very great responsibility resting on his shoulders. It is regrettable that with the anthracite business hampered so much from without there should be so much friction from within.

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The Trend of Conditions on New Contracts

The important contracts under consideration in the coastwise trade the past month have been the Boston & Maine R.R. locomotive supply and the Panama R.R. Co. The Boston & Maine contract (No. 1313, Vol. 8, p. 367) provides for 720,000 tons a year for one-year and five-year terms respectively, either f.o.b. loading port or delivered alongside Mystic Wharf, Boston, deliveries to begin on the expiration of present contracts, in August, 1916, and April, 1917.

At this writing no award has been made, but the conditions of the order are so unusual that they have caused considerable comment. It is recognized that there are only a few shippers, probably not more than three or four, who are likely to undertake business of that size so far ahead. The largest part of this tonnage is now furnished via Norfolk from the Clinch Valley region, and the trade is keen to see whether the present suppliers will be able to hold the order against interests that ship from the Fairmont and adjacent districts via Baltimore. The latter have been securing most of the New Haven business the past year, and the two railroads are of course closely associated.

The bids on the Panama R.R. Co. contract (No. 1327, Vol. 8, pp. 367 and 446) seemed to show the same purpose on the part of Hampton Roads shippers as on previous Government contracts the past year—to keep other coals out of the running. Two bids of $2.60 f.o.b. Philadelphia on Cambria County coal would have had to be seriously considered had not 400,000 tons of Pocahontas been offered at the same figure at Norfolk.

So low a price would be surprising, in view of admitted prospects for fall and winter trade and a possible labor disturbance in the spring, were it not for the fact that most of the demand is expected to come from the export market, and that those shippers who are credited with heavy tonnages offshore either quoted considerably higher or did not bid at all. Compared with last year's bids on the same contract (Nov. 24, 1914, Vol. 6, pp. 814, 854, 892, 933 and 1048), the low Pocahontas price is 10c. less and that on Cambria coal 8c. less. The Panama R.R. Co. therefore will probably buy its supply at an average price materially less than last season.

In the Philadelphia market the contract trade is extremely dull, the only business offering being 600 tons of anthracite buckwheat, asked for by the Philadelphia County Prison, and the United States Government contract at Wilmington, Del., for supplying 3000 tons of bituminous coal for use in channel work for Philadelphia Harbor. While the prices on the latter contract are not yet available, it can be definitely said that the bituminous interests are not anxious to accept any business at a figure less than the market price.

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Should Coal Cost More?

Would it benefit the people of the world if the price of coal should be universally raised 50 or 100 per cent.? From one angle it appears as though such a thing should be done.

In the early days of the steam engine the cost of power was enormously high despite the cheapness of fuel. The apparatus in those days was decidedly inefficient, and the first cost of machinery was extremely high. That is one reason why there was so little machinery in use.

With the increase in the cost of coal came more efficient machinery—so much more efficient, in fact, that power became cheaper per kilowatt-hour at the switchboard than it had been before. The very slight increase in the price of coal in recent years is logical enough. Practically all prices of life's necessities have gone higher. And inasmuch as coal is gradually becoming more difficult to mine, its cost should increase.

On the other hand, our scientists are studiously plodding along in their laboratories, cheapening our power for us. Perhaps they are doing as much as they can right now, and perhaps not—who knows? If we should suddenly increase the cost of coal, thus imposing a "peak load" on our scientific friends, wouldn't it stimulate them to such concentrated effort that within a few months they would again bring the cost of power lower than it is today? It looks as though that is exactly what would occur. The scientists need a stimulus. They are a little ahead of the game now, so why should they worry so long as the operator is willing to be the goat?

There is no question but that even now, with our unprecedented knowledge of coal and power, coal is being criminally wasted. Dr. Rudolph Diesel has shown that a thermal efficiency of close to 50 per cent. is a practical possibility with the use of oil as a fuel.

In the early days of his work he proposed injecting a mixture of coal and oil into his engine, but it seems he did not succeed in making a success of such practice.

Perhaps somebody will do it some day, or perhaps somebody will accomplish the same thing in a different way. It may be that in years to come a 50-per cent. thermal efficiency with coal as a fuel will be a common event. In that case we will only burn from 5 to 20 per cent. as much coal as we are now consuming.

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The Oct. 2 issue of *Coal Age* will be devoted to "Safety in Mining" and we invite our readers to send us articles on this subject.

Sociological Department

Valley View First-Aid Meet

SYNOPSIS—The Pennsylvania Coal Co. and the Hillside Coal and Iron Co. held their tenth annual contest on Aug. 28. These companies were pioneers in the holding of such contests in America.

Evidencing a remarkable increase in efficiency, all the 18 teams competing in the tenth annual first-aid contests of the Pennsylvania Coal Co. and the Hillside Coal and Iron Co. at Valley View Park, Inkerman, on Aug. 28, attained general averages of over 91 per cent. in the three-problem contest for the Capt. W. A. May Cup.

A drizzling rain that broke about noon and continued at intervals chilled the spectators and doubtless kept many people away, but despite the weather conditions more than a thousand persons witnessed the contests and showed a lively interest in the demonstrations.

The Pennsylvania and Hillside companies were pioneers in fostering this great work in the United States a full decade ago and have kept up the excellent work by holding the annual intercompany contests. Dr. F. F. Arndt, of Scranton, Penn., has for several years been in charge of the first-aid work of the two companies. During the winter months he instructs the different colliery teams and in the early summer holds district contests, to select the most efficient teams to compete in the intercompany meeting, of which also he has charge.

Year by year, with the extension of the work, the expertness of the men has become more pronounced, and the general efficiency that has been attained in this the tenth year, is so close to perfection that surgeons and first-aid authorities declare that the treatment of accident cases by the companies' first-aid teams leaves little to be desired. With the growth in expertness the tests at the first-aid contests have grown more difficult, and the problems now being given are extremely exacting.

MAY CUP GOES TO NO. 8 SHAFT AND NO. 9 BREAKER

The chief award in the contest was a year's possession of the Capt. W. A. May Cup, the handsome trophy donated by the president of the companies. To secure permanent possession it is necessary for a team to win the trophy three times. A former cup was won for the third time by the Law shaft team of the Avoca district in 1911. The present trophy has not been won twice by any single team.

THE PENNSYLVANIA COAL CO. AND THE HILLSIDE COAL AND IRON CO. HOLD THEIR HISTORIC MEET THIS YEAR IN THE DRIZZLING RAIN

The company officials have carefully fostered their first-aid work. To increase individual expertness, a one-man or individual contest was instituted in 1913 for the best operators in the different districts. Gold watches and other valuable prizes were given to the winners A year ago a social atmosphere was lent to the annual event by the presence of a band to furnish music for dancing, and this year another diversion was an athletic program, with a varied list of events, including some novelties, for the employees and their families. The closing of the mines converted the affair into a general outing, and many families spent the day at the park.

This year the cup contest consisted of three full-team events. Each team was composed of five operators and a subject. Three problems, touching different phases of first-aid work, were given. Making a general average of 98⅓ per cent., the No. 8 shaft team and the breaker team of No. 9 colliery, North Pittston district, Pennsylvania Coal Co., tied for first position. As the two teams are from the same colliery, the tie was not broken. The remarkable and significant feature is that not a competing team made a lower average than 91⅓.

The winning teams were composed of the following members:

No. 8 Shaft—James Hopkins, captain; Michael Dunn, Peter Bedford, Richard Lynch, Michael Hoban; Joseph Barrett, subject.

No. 9 Breaker—Thomas E. Ross, captain; Luther Heal, John E. Miller, Max Melcher, Harold Herbert; Floyd Ramage, subject. Of this team, Ross and Heal have both won the individual events in other contests.

The averages made by the teams follow:

SCORES OF TEAMS IN FIRST-AID CONTEST

	Problem			General
	1	2	3	Average
No. 8 shaft, No. 9 colliery	100	100	95	98⅓
No. 9 breaker	95	100	100	98⅓
Clark slope, Avoca	100	96	98	98
No. 2 shaft, Old Forge	100	96	95	97
No. 2 shaft, Forest City	100	95	95	96⅔
Checker vein, No. 14 colliery	98	93	98	96⅓
No. 2 shaft, No. 1 colliery	100	93	95	96
No. 5 shaft, No. 5 colliery	95	95	98	96
Central breaker	95	93	100	96
Erie colliery, Mayfield	96	93	96	95
No. 6 shaft, No. 6 colliery	93	96	95	94⅔
Underwood colliery	93	93	96	94
Courtright slope, No. 14 colliery	95	92	95	94
Gray slope, Forest City	88	100	94	94
No. 5 shaft, No. 6 colliery	90	100	91	93⅔
No. 1 shaft, No. 9 colliery	85	93	96	91⅓

The problems were divided into three parts, one covering the treatment of wounds and bleeding, another the handling of burns, scalds, sprains and dislocations and the third the splinting and bandaging of fractures, simple and compound.

The individual contest brought together the pick of the experts of the region. The six contestants were given the following problem to solve: Apply a double-crossed bandage to the jaw of the victim and dress a wound on the front of the chin. Control bleeding in a case where the right arm has been cut off within 2-in. of the summit of the shoulder. Show how to control bleeding where the left arm has been cut off 6 in. above the wrist. Show how to control bleeding where the right foot is cut off at the instep. Bandage the left foot, leg, thigh and left groin.

After the demonstration the judges put the contestants separately through an oral examination on the problem and on first-aid work generally, the oral test ranking equally with the demonstration. A remarkable commentary on the excellence of the work is furnished by the fact that Clement Farrell, of Mayfield, aged 22, made a perfect score in both the physical and oral examination. He was awarded a handsome gold watch.

The other contestants made the following scores: William Creedon, Avoca, 96⅓, Alexander Tait, North Pittston, 92; Harry G. Jones, Forest City, 91; William Tewksbury, Dunmore, 85⅔; Peter Hoolihan, South Pittston, 80⅔.

BUT LITTLE OF THE PATIENT'S ANATOMY ESCAPED THE BANDAGE

The officials of the meet were: Director, Dr. F. F. Arndt; timer, Edgar C. Weichel; recorder, F. D. Conover; judges, Dr. F. J. Bishop, Dr. W. E. Keller and Dr. W. G. Fulton. The committee consisted of C. H. Frederick, chairman; W. P. Jennings, H. T. McMillan, F. H. Wright, J. P. Jennings and F. H. Coughlin.

The crowd thronged the athletic field to witness the athletic contests. The Pennsylvania Coal Co. won the tug-of-war in which the foremen and assistant foremen of the two companies were pitted against each other, and the strongest employees of the two companies tugged manfully. Other results were: Putting the shot, William McGuire, 36 ft. 10 in.; pipe race, Michael Hoban; fat man's race, George Parry; boys' race, tie between Frederick Llewellyn and Jacob Nagle; standing broad jump, Chester Adams, 9 ft. 2 in.; three-legged race, Max Nelson and John Tischler, first; egg race for ladies, Mrs. John Huffsmith; boys' race under 17, Victor Valerious; 220-yd. dash, Chester Adams.

O. W. Wintermute, physical director of the Pittston Young Men's Christian Association, directed the athletic events.

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Old Company's Annual Meet

SYNOPSIS—The Lehigh Coal and Navigation Co.'s meet covered not only first-aid but land and water sports. A sparring match with heavily padded gloves was an interesting feature. The different districts competed for supremacy in aquatics and athletics and for the possession of a champion trophy, just as they competed there and have in other places for leadership in first-aid and for the ownership of a cup.

The third annual outing and first-aid contest of the coal-mining department of the Lehigh Coal and Navigation Co. occurred at Lakeside, about 6 mi. from Tamaqua, Penn., on Saturday, Aug. 28, and notwithstanding the efforts of the Weather Bureau to dampen the ardor of the contestants and spectators, a series of contests in first-aid and sports was held which will long be remembered as the most successful and enjoyable ever arranged by the company.

A special train starting from Lansford at 8 a.m. gathered up the participants from the Panther Valley, approximately 750 altogether, and reached Lakeside at 9 a.m. Immediately on leaving the train the participants, led by an excellent brass band composed of Slavic employees of the company, formed a line of march to the field where the first-aid contests were to be held, and no time was lost in getting to work.

In the first-aid contests 27 teams participated. For some time previous these corps had had special training in 20 different problems, from which five were chosen by lot just before the contests began, and the teams were not advised as to the problems to be presented until they were announced by megaphone as each event was to be contested. The problems drawn for the contest were:

One-Man Event—Dress a simple fracture of the lower jaw and a gash on the left leg over the knee. Time, 4 min.

Two-Man Event—Dress frostbites of both ears and both hands. Time, 4 min. This problem was introduced for the first time into a first-aid mine contest.

Full-Team Events—Dress a compound fracture of the right thigh and laceration of the scalp on a line from the forehead to the base of the skull. Time, 8 min.

Dress a compound fracture of the left leg and a simple fracture of the right collar-bone. Time, 8 min.

Treat conditions of man overcome by gas, with burns on head, neck, upper chest, forearms and hands. Give artificial respiration for 1 min. Treat for shock. Dress burns. Time, 8 min.

In these and in the 4-min. events several of the teams completed the treatment of the subject in about half the time allowed. The celerity with which the work was performed, as well as the perfection of the job itself, testified to the enthusiasm of the men and the excellence of their training.

The three winning teams were (1) the outside employees of Lansford district, Alexander Gibson, captain, with a score of 98.4 out of a possible 100, the special prize being $25 in gold to the team and a silver medal with his name engraved thereon to each of its individual members; (2) employees at Nesquehoning shaft, Fred Heffler, captain, with a score of 97.6 points, the prize being $15 in gold; (3) employees of the electrical department, Thomas F. Whildin, captain, with a score of 97.4 points, the prize being $10 in gold.

In the 1914 contest the first prize was won by the outside employees at Nesquehoning, the second by the electrical department and the third by the Lansford shops.

Of the 27 teams competing for the prizes, 6 were from the Nesquehoning district, 5 from Lansford, 5 from Coaldale and 7 from Greenwood. These district groups of teams also competed for a cup trophy presented by the company, the prize being awarded to the district having the best general average in the first-aid contests. The Hauto washery, Lansford shops and electrical-department teams are excluded from this competition. The cup is held for one year by the district winning it until one district has won it three times, when it becomes the property of that district. Coaldale district, with a general average of 95.3, wins the cup for 1915, Lansford and Nesquehoning being nearly tied for second place with 93.8 and 93.6, respectively.

WATER SPORTS IN THE PARK LAKE

Immediately after the completion of the first-aid contests the spectators and contestants moved to the lake shore, where, after a sandwich luncheon, the water sports began. These consisted of two swimming and two rowing contests, in which the four districts competed. Both swimming contests were won by William Barry, of Greenwood district. The single-oar boat race was won by H. Houser, of Coaldale district, and the double-oar race by W. Miller and L. Hiles, of Nesquehoning district.

After the water sports were finished and before the field sports began, a bountiful and excellent dinner, under the direction of Edward Petzel, steward of the Old Company's Club at Lansford, was served in the grove, and though most of the guests not provided with raincoats or umbrellas were by this time fairly wet to the skin, there was little lacking in enthusiasm or appetite, and ample justice was done to the feast. Steward Petzel says he never saw a hungrier lot of "boys."

BOXING CONTEST FOR POINTS

An unusual and particularly appreciated event introduced at this outing as a diversion just preceding the field sports was a boxing contest with soft gloves. This consisted of three bouts, two of a preliminary character, between representatives of the four districts, and a final bout of six rounds, in which the winner was given a prize of $20 in gold and the loser a consolation prize of $10. The boxing contests provoked as much enthusiasm as any of the events, though no points were given to the winner on the general sports' score.

Up to this time the weather conditions had been about as unpropitious as they could be. The sky had been overcast from the early morning and a chill easterly wind had brought rain just as the march to the first-aid trials began. Fortunately, however, the rain, though chill, particularly to the "patients," whose attire was necessarily scanty, was not heavy enough at any one time to interfere with the program or to send the spectators to cover. During the afternoon when the field sports were being held the weather conditions were more favorable, the rain clouds withdrawing for a time as though showing more sympathy with the athletic than with the first-aid contests.

ATHLETIC CONTESTS COMPLETED MEET

The field sports consisted of running races, standing and running jumps, potato races, putting the shot and the tug-of-war. The winners of first place in both field and water sports were given 6 points. Those who won second place were credited with 4 points, those securing third place were awarded 2½ points, while those placed fourth were given only 1 point. In the tug-of-war, however, the winning team was given 10 points. The trophy for the field sports is also a silver cup, and the same rule obtains as to its awarding as governs that offered for competition in the first-aid contests. The winner this year was Greenwood, with a total of 54 points, the decision resting upon the result of the tug-of-war, with its 10 points, which was won by the Greenwood district. The points made by the other districts were, in order: Lansford, 47.5; Nesquehoning, 35.5; Coaldale, 17.

The individual winners in these events were as follows: 50-yd. dash for 50-yr.-old men, won by A. Haughton, of Lansford district, time 7 sec.; 100-yd. dash, won by George Jones, of Nesquehoning, time 10 sec.; 220-yd. dash, won by same; standing jump, won by Joe Leckitas, of Greenwood district, 9.65 ft.; running jump, won by William Richards, of Lansford district, 18.8 ft.; potato race, won by William Richards; putting 16-lb. shot, won by William Brennan, of Lansford district, 30.7 ft.

Wentz Allied Companies' Meet

The Wentz Allied Companies include the Midvalley Coal Co., at Wilburton, Penn.; J. S. Wentz & Co., at Hazle Brook, Penn., Upper Lehigh Coal Co. at Upper Lehigh, Penn., and the Maryd Coal Co., at a town of the same name, also in Pennsylvania.

These corporations held their second annual first-aid meet and field meet at Hazle Park, Hazleton, on Friday, Aug. 27. The weather was not by any means propitious but though conditions were threatening, the program was not revised.

Twelve teams of adults competed for the prizes, which were a silver trophy cup for the leading team and $25 in gold for the second team. The breaker boys, who had three teams in the meet, competed for a prize of $5 in gold. The Upper Lehigh teams were successful in landing the cup and money prizes, the first going to the No. 2 team and the second to the No. 1 team of that colliery. The management of the companies was so well pleased with the showing of the breaker-boy teams that they were all given a prize of $5 in gold. The problems were as follows:

One-Man Event—Leg crushed off below knee; stop bleeding and dress stump.

Two-Man Event—A man has his arm caught in a machine, by which it is torn off completely and pulled out of the socket at the shoulder joint. Control hemorrhage and dress the wound. State to the judges what was your first method and what your final method of stopping the flow of blood; state also your final disposition of the injured man. Time, 10 min.

Three-Man Event—Right ankle dislocated, compound fracture of the lower third of the same leg, with arterial bleeding. Time, 10 min.

Four-Man Event—A man, overcome by heat, falls and fractures his skull. Resuscitate and dress fracture. Time, 6 min.

Full-Team Events—(1) Dislocation of the spine. Simple fracture of the left arm and forearm. Time, 15 min. (2) A miner is caught by flying coal from a shot which was supposed to have missed fire. The right side of his face is badly cut, his right eye is blown out, he sustains a simple fracture of the right thigh, and three of his lower ribs on the left side are broken. Time, 18 min.

Triangular bandages were used in solving all problems as stipulated in the rules. The contest was close, the teams being all of about equal ability. The judges were strict in their oral examination of the captains, and each team was closely questioned as to the method pursued in treating the various injuries.

The judges were: Dr. Biddle, of Fountain Springs; Dr. J. M. Maurer, of Shamokin, surgeon of the Susquehanna Coal Co. in that territory; Dr. D. H. Lake, of Kingston, surgeon of the Delaware, Lackawanna & Western R.R. Co.'s collieries; Dr. Robert Gaughan, assistant surgeon at the Hazleton State Hospital. Dr. Montelius, of Mt. Carmel, was starter. Messrs. Ward and Kotch of the companies were the scorers.

After the contest the men and invited guests, totaling in all 400 persons, were invited by the company to a dinner spread under the trees in the park. After dinner a baseball game and shooting match completed the entertainment.

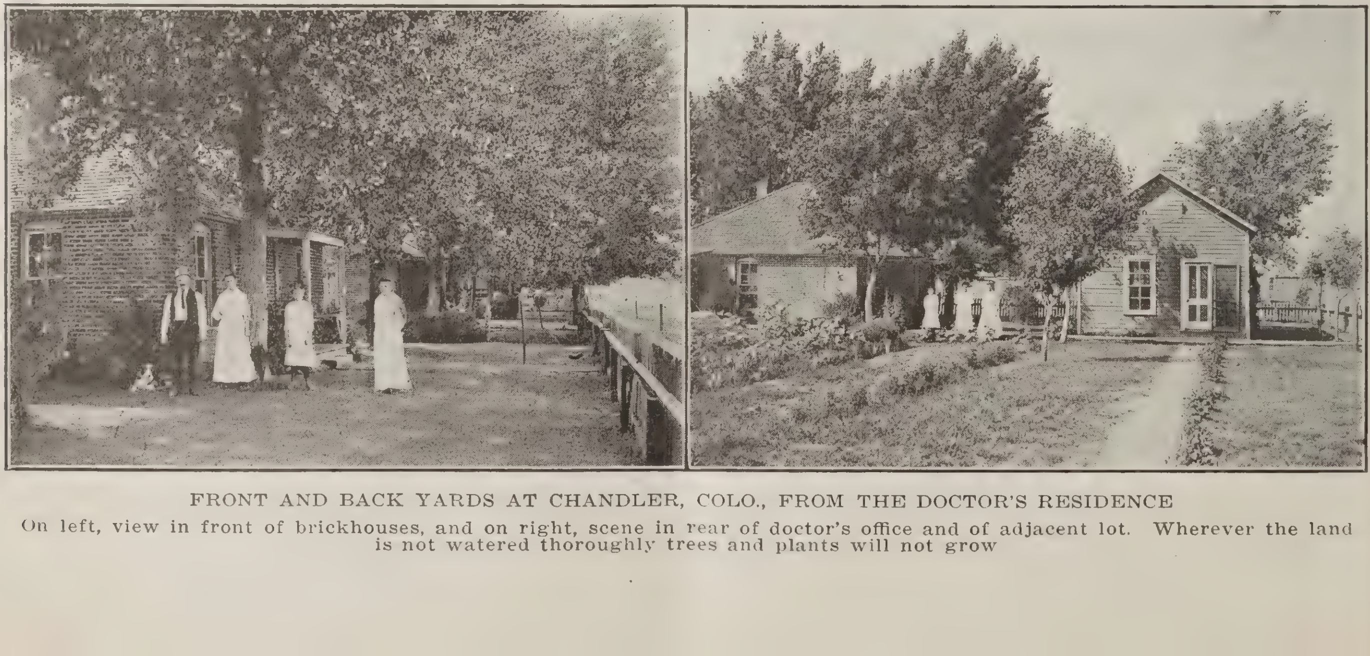
Victor-American Fuel Co.'s Garden Contest

By C. S. Taylor*

The Colorado division of the Victor-American Fuel Co. held its third annual contest for lawns, flower gardens and vegetable patches the latter part of July of this year.

In every mining town where the company has interests and where sufficient water is available for irrigation three cash prizes are awarded, consisting of $25, $15 and $10 each,

THE JAPANESE BOARDING HOUSE AT DELAGUA HAD A GORGEOUS DISPLAY AND TOOK FIRST PRIZE


FRONT AND BACK YARDS AT CHANDLER, COLO., FROM THE DOCTOR'S RESIDENCE

On left, view in front of brickhouses, and on right, scene in rear of doctor's office and of adjacent lot. Wherever the land is not watered thoroughly trees and plants will not grow for the best yards, whether they are planted to grass, flowers or vegetables.

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The only conditons imposed are that there be three or more contestants in each town, and that those participating in the contest be bona-fide residents of the place and employees of the Victor-American Fuel Co.

The mine superintendent, surgeon and clerk are excluded from participation in the awards, although these three individuals have always received a liberal amount of praise from the judges in making their rounds. Disinterested parties residing in some neighboring town are selected for the judicatory board.

AUGUST HUTTER RECEIVED FIRST PRIZE AT CHANDLER FOR HIS PRETTY GARDEN

Each year an improvement is noticeable over the work of previous years. More are participating each year and the standard is raised as time passes.

The following awards were made:

Delagua—First prize, $25, J. M. Kawahata, Japanese Hotel; second prize, $15, John Ban; third prize, $10, Carr Robson. Judges: Charles Epstein and A. A. Bennett.

Hastings—First prize, $25, Mrs. Elizabeth Roberts; second prize, $15, W. S. Krause; third prize, $10, W. M. Cunningham. Judges: Charles Epstein and A. A. Bennett.

Chandler—First prize, $25, August Hutter; second prize, $15, Joseph Charis; third prize, $10, C. H. Smith. Judges: John Shaw, Hunter Palmer and H. Galley.

Ravenwood—First prize, $25, William Smith; second prize, $25, divided among B. Pastoria, John Happa and Joe Watson. Judge: S. M. Andrews.

At Ravenwood there were three contestants who had exactly the same percentage, so it was decided to amalgamate second and third prizes of $15 and $10 respectively, giving each of the three contestants an equal share.

Contest at Knoxville, Iowa

By H. C. Austin*

SYNOPSIS—First-aid work makes slow but sure progress in Iowa, and is being steadily fostered by the labor unions. The meet at Knoxville in Marion County was attended by only three teams.

Compared with her sister states, Iowa in general may seem to lack enthusiasm in first-aid work. Yet the Des Moines first-aid contest and several minor events since may fairly be deemed to show that a campaign has been started in that state which can hardly fail to be successful, should the contests in the future interest both the mining fraternity and those in other walks of life as did the contest held at Knoxville.

This event was held as an additional attraction at the Labor Day celebration of that town. The contest was inaugurated more for its educational value to the community than for any other purpose, and it served its purpose well, judging from the remarks and comments made by the spectators. The majority stopped to see what was going on purely from curiosity, but stayed to the end of the contest intensely interested and amazed to see the work done by the first-aid teams.

The contest was under the general supervision of Sam Ballantyne, vice-president of District No. 13 of the United Mine Workers of America, who with great skill "ran off" the meet without a "hitch" in the proceedings.

A MINING COUNTY WITHOUT A FIRST-AID TEAM

Knoxville is the administrative seat of Marion County; but while there are several important operating mines in that political division none of them has a first-aid team, so all the contestants came from other counties in the state. The personnel of the teams was as follows:

The Seevers Team of the Colfax Consolidated Coal Co. from Seevers, Iowa—Noah Barker, captain; Evan James, Russell Williams, Frank Willey and Fred Dickey. The Buxton Team of the Consolidated Coal Co., Buxton, Iowa—G. D. Yancy, captain; Allen Staten, James Gillette, G. W. Broots, William Phillips and Fred Coleman. The Hocking Team of the Hocking Coal Co., Hocking, Iowa—J. G. Henwood, captain; Clyde McDonald, John Wilson, William Chemington, Sam Oudrens and Ed Thorpe.

The last-mentioned team took first prize in the Des Moines meet this spring and also contested at the Kansas City meet of recent date, where only by reason of a misunderstanding they failed to be awarded the trip to the Panama-Pacific International Exposition.

NONE BUT FULL-TEAM EVENTS WERE CONTESTED

Three problems were worked out, which were selected by Mr. Ballantyne from a list of five, all of them being full-team events. They were as follows:

Man found with broken back. Prepare patient for removal and stand in an upright position. Time, 12 min.

Miner caught between loaded cars. Rib and right shoulder blade broken; left arm broken 3 in. below elbow; left foot crushed; cut on right cheek. Improvise stretcher and carry 50 ft. Time, 12 min.

Simple fracture of right thigh; fifth and sixth ribs on left side broken; compound fracture of right wrist; bright-red blood issuing. Improvise stretcher and carry patient 50 ft. Time, 11 min.

The first event was the most closely contested, all the teams averaging above 90, as follows: Seevers team, 96 per cent.; Buxton team, 94, and Hocking team, 91.

The second event seemed to give the most trouble, the difficulty being not so much in technique as in minor matters. The Buxton team bandaged the wrong arm. The Hocking team seemed to be somewhat nervous in that event and was penalized for not having sufficient material on hand, also for awkwardness, slowness and the faulty directions of the captain.

However, that team made up for these lapses in the last event, in which it made a perfect score. The Buxton team again fell down rather badly, suffering a 13-point penalty. The Seevers team was deliberate, methodical and consistent throughout, only losing 16 points in the three events, the final score being as follows: Seevers, $94\frac{2}{3}$; Hocking, $93\frac{1}{3}$; Buxton, $86\frac{1}{3}$.

Drs. Connell, Ames and Wright, all of Knoxville, were the judges. Dr. A. E. Reiter and H. C. Austin were score-keepers and Senator Clarkson, of Albia, acted as timekeeper.

The contest was witnessed by approximately a thousand people. The crowd as a whole, was either bent on pleasure, or had not felt hitherto any interest in work of this character, but that so many turned aside to view the contest shows that the exhibit did much to advance the progress of first-aid in Iowa.

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Montana Hoisting Engineers—Employment of operators of electric and air hoisting engines used in lowering or hoisting men is regulated by a law adopted at the recent session of the Montana legislature. Section 1 makes it unlawful for an unlicensed person to operate such an engine of more than 25 hp., subject to the same exception in emergencies that is made by the revised codes of the state concerning the employment of unlicensed operators of steam engines and boilers. Sections 2 and 3 provide for issuance and revocation of licenses by the state boiler inspector and authorize persons who hold first-class licenses for operation of steam engines and boilers to operate electric and air hoists without the license prescribed by the new law. Section 4 divides the licenses into two classes, the first being limited to applicants who have had three years' experience or more in operating electric or air hoists and authorizing operation of any such hoist and the second class being limited to applicants with at least two years' experience and forbidding operation of a hoisting engine of more than 100 hp. Section 7 makes it a misdemeanor for an unlicensed person to operate any of the machinery covered by the act or for an owner or manager to employ any such unlicensed person.

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*Mining engineer, Consolidated Indiana Coal Co., Melcher, Iowa.

Discussion by Readers

Responsibility of Miners

Letter No. 1—In my experience of 25 years in coal and metal mining, during which time I have endeavored to make a close study of mining conditions, I do not recall anything that has so aroused to action all mine operators and officials as the great "Safety-First" movement has done. There can be no question but that the measures adopted by these operators and officials have warded off many accidents and saved lives. But what has been done in this direction only leads one to ask, Why have these efforts put forth so earnestly not accomplished more than they have? The problem is not easily solved, but there are three reasons that, when well considered, speak volumes. I will refer to these separately and briefly.

First, the newspaper press and many news agencies seem to take special delight in assailing the great coal companies of our country, with the result that they have educated the average miner to believe that these companies are directly and wholly responsible for the safety of their employees in the mine. This idea has taken so large a possession of the minds of the general miner that he has come to feel no personal responsibility for his own safety while in the mine. He believes that it is the company's place and duty to take care of him. Many a time the miner knows what he should do for his own safety and yet puts off doing the work until he is instructed to do it by the mine foreman or his assistant.

On this account, while mine officials have made great advances in the direction of safety, miners as a class have retrograded along this line. Not many years ago little attention was given by the operator to the question of making the mine safe, but his chief thought and effort were devoted to increasing his profit. The safety of his employees was not a matter of his concern. Today the first consideration in all uptodate mines is the safety of the men employed. Formerly the miner had to work single handed for his own safety. Now, how much more could be accomplished if the miner would coöperate with his employer in matters of safety and realize his own personal responsibility in this matter? The miner must remember that no one but himself can exercise the constant vigilance and care needed to avoid the unseen and often unexpected dangers that surround him while at work.

Second, the present-day tendency of the miner is to shorten his hours of work and increase his daily output of coal. In his haste to do this and load his turn of cars, he gives little attention to the safety of his surroundings and neglects or postpones to do what his better judgment would tell him is necessary in order to make his place safe. This rush to load coal not only affects the miner but urges the drivers to the same recklessness and disregard of safety in their efforts to supply the turn of cars.

Third, few will deny that there is prominent in many mining towns a spirit of recklessness. There can be no question but that this spirit is destructive of all that pertains to personal safety and the security of property. I believe that much depends on the earnest efforts of coal companies to repress this spirit of reckless bearing among its employees. I believe that this should be made a feature of the work in the safety movement. Much could be accomplished in this regard if a certain portion of the money spent for increased safety could be devoted to the development of the church life and work in the community in mining towns. In the associations of the church, men are led to regard life as sacred and are impressed with a seriousness in regard to death. This leads them to a fuller realization of danger and the exercise of greater care and caution in their daily work.

These three causes, as I have said before, speak volumes and furnish much food for thought. They deserve careful consideration in our efforts to make mines safer.

C. W. Rotenberry, Supt.,
Stonega Coal & Coke Co.

Arno, Va.

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Labor in Mining

Letter No. 9—Referring to the article of Josiah Keely, *Coal Age,* Aug. 21, p. 294, in which he discusses the question, "Why are strikes at coal mines of such frequent occurrence?," I desire to offer a few comments, which should not be regarded as criticising any of Mr. Keely's statements, but merely expressing my own opinion on this subject.

It would seem that Mr. Keely's statements refer mostly to conditions in our own state of West Virginia. There are, no doubt, many reasons for the present unrest; but, in my opinion, the chief reason is the enmity that has existed for a number of years between employers and their employees. The feeling may not be as strong today as formerly, but it cannot be said to be eliminated. Up to a few years ago, as is well known, certain coal operators had the upper hand in their own counties and in the state. In one instance an operator was styled "king" of the county, where he not only ruled the mines with an iron hand but controlled the whole political machine, which he had built up in that county. His ruling days came to an end, however; but in leaving he could not take with him the hatred he had generated in the miners.

I am happy to say that conditions are not the same today, though all mining districts in the state are not alike. There are fields that always had more or less trouble before they were unionized, but the trouble increased when they became organized as a union. There are other fields where no union exists, and trouble is almost a stranger, although it cannot be said that the working and living conditions are quite so good there as in the other fields. The reason for this is that the mines are smaller operations and the owners come into closer touch with their men, whom they strive to treat fairly, as far as their limited means permit.

The miners working in these smaller operations have not been oppressed as those in the larger fields, where the owners of the mines are hardly known. The mines in those fields were largely in charge of a superintendent, who had nothing at stake but his position and was determined to be boss as long as he lasted. He often overstepped his rights, not only in the mines and during working hours, but in the social life of the camp. I do not mean to say that there were not some good officials among them, but they were in the minority. Neither do I mean to suggest that a mine official can be given too much power as long as he uses it with discretion.

It often happens that a superintendent who has made good in one field, on changing to another field, discovers that he must change his ways of dealing with the men. A superintendent will often misjudge his man, as in one case, when that official remarked, "Mike is a good loader; there is none better in the mine; but he wants to be jollied along." Now, I will say that if Mike comes out and asks for more props he doesn't want to be "jollied," he wants props. He may not say much when he gets a jollying instead of the props; but as the Irishman said of his parrot, "He don't talk much, but he is a bugger to think." Mike will take the jollying for a time, but some day he will explode, and the explosion will bring out of the mine all the other Mikes. Then the management wonders and asks, "Why are strikes at coal mines of such frequent occurrence?"

I have referred to the prop question only as an illustration. It is a trivial matter that is easily adjusted if attended to in time; but there are other trivial matters that are too often "jollied" down instead of being met fairly and squarely, and satisfaction given before they become real grievances.

Every mine official should be able to command the respect of his subordinates, and likewise the respect of every worker in the mine. But in order to do this he must be thoughtful and study the situation as it is. Should the field be unionized, he should try not to allow his mind to become prejudiced against such a condition, but endeavor to establish good terms between himself and the union. In that case, should trouble arise, the miners will surely see him before throwing down their tools and going out on a strike.

In every case, miners should be made to feel that they will be given justice. Should they be in the wrong, the superintendent should talk over the matter with them as man to man. It may happen that there are some black sheep, but the effort must be made to overbalance their influence among the men. The superintendent must remember that miners have the same right to organize as the operators in whose mines they are employed.

Operators, not only in West Virginia but everywhere else, would do well to study the system of one of the largest coal companies in the state of Wyoming. The management has to contend with Greeks and Japs, in addition to all the other nationalities that frequent our coal fields. The field is organized and it is doubtful whether the company would desire to return to the open-shop system. They encourage the union in every possible way, with the result that most of the men are satisfied and contented. They see to it that their committees are composed of the most liberal-minded men in the camp.

Now observe how, under these conditions, troubles in the mine work out in a reasonable way. Suppose, for instance, a motorman, timberman or trackman, so minded, aims to do as little work as possible for the time he puts in. There is surely a miner who is inconvenienced in his working place because of this man's shiftless ways, and the fellow is soon reported to a mine committee, which promptly takes up the matter with the guilty one and gives him a chance to mend his ways or submit to having his case called to the attention of the foreman or superintendent. The union motto in that camp seems to be, "A fair day's work for a fair day's pay." It is understood that every man must work so as to do justice to the company, the union and himself. That kind of union almost eliminates the type of man who insists on getting daywork inside of the mine, where he can lose an hour in the morning and be hunting for it the rest of the day.

It is good to notice, however, that there are many signs which show that West Virginia is coming to the front, her natural place in coal mining. The violence that has dominated the early union is fast being replaced by the order that characterizes the modern union. False leaders and agitators are beginning to find that the rank and file of the miners will not be led to repudiate their contracts and indulge in violence and disorder.

C. J. FUETTER.

Logan, W. Va.

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Efficient Mine Foremen

Letter No. 3—Let me first ask the question, What is a mine foreman? I would answer: A mine foreman is the man who is held responsible for everything that happens in the mine, which may mean the loss of a life, or the cost per ton of coal produced, or anything that may come between these two items. He is the man whom the mining department holds responsible for the carrying out of the mining law under penalty of imprisonment or fine. The mine superintendent expects him to deliver the coal to the tipple at the very lowest cost. The employees expect him to adjust all their grievances, whether real or imaginary. If he fails to do this to their entire satisfaction he is at once pounced on by the officials of the miners' union. Again, he is never sure of the position he holds. At any time the superintendent or the operating company may become dissatisfied with him and, as a result, he must go. There is no one to whom he may appeal, and he finds himself, on very short notice, without work. Hence, we can see that this is not the best of positions to occupy.

Let us now see what a man must be before he can prove efficient as a mine foreman. He must be a man who is strictly sober and also honest, one that will refuse to take a gift however small from any of the workmen. He must be a man that has the confidence of all who work under him, one that can keep cool in any emergency and teach others to do the same. He must be energetic in his studies and keep up with the ever-changing conditions of mining. He must understand the theory as well as the practice of mining. It will be better for him if he has worked up from a trapper boy or driver.

He must be able to render first-aid treatment to an injured man, no matter how serious an accident may occur. He should be a man who can pass an examination, proving to the state mining department that he understands all the state laws of mining; can work out various problems in ventilation; knows the properties of the various gases met with in coal mining; is able to attend to the drainage of the mine and has a good practical knowledge of electricity. He must at all times carefully watch the ventilation of the mine and measure the air current as prescribed by law. If he finds it sluggish, he should at once ascertain the cause, which will probably prove to be a fall in the air course, a broken-down stopping or an open door, and proceed at once to remedy the trouble.

In mines generating firedamp the foreman must see that all persons are out of the mine before permitting the fan to be slowed down or stopped for repairs. His motto should always be (1) the safety of everyone under his care, (2) the safety of the company's property, (3) cost of operation. Some companies appear to have reversed these items. He must be a man who has the force of his own convictions, be able to say "No" and strictly adhere to his decisions, having first made sure that he was right. He must, as nearly as possible, carry out the mining law to the letter. He must be a man of original ideas, but never feel himself too big to take advice, even if it comes from a coal digger.

To review more fully some of these qualifications, it may seem strange to many readers of *Coal Age*, but there are mine foremen who have few of the qualities mentioned. Such a man holds his job simply because he can get out the coal at a reasonable cost by bullying the motormen or the drivers, as the case may be. He does this more readily if they are foreigners. His other responsibilities are taken care of by his assistants. This can only happen in a state where the mine foremen do not have to pass an examination.

Again, there are mine foremen who are quite up to the standard and have all the above-named qualifications. A man who is strictly sober is most likely to succeed, because he can keep clear of the traps that are set by the wary miner for the mine foreman who takes a drink once in a while. It is a well-known fact that when a miner gives anything to the boss he always expects a great deal more in return. There are various ways to gain the confidence of the men. Treat them as you would like to be treated yourself; help them in any way you can. This may mean assisting a man to put a car on the track, lending a hand to put up a cross-timber, helping a man to charge a hole, or helping to do any other little thing that a mine foreman may come across during his daily examination of the working places. These acts are not much in themselves, but they go a long way toward gaining the confidence of the men. First-aid should be understood and practiced by every mine official, both inside and out of the mine. How ridiculous a mine foreman looks when an accident occurs and he is not able to give the proper aid.

Some superintendents appear to like the idea of cutting down the mine foreman's order for supplies each month. In that case the efficiency of the foreman is greatly curtailed. No sensible-minded man will pass in an order for supplies that he does not need. Recovery of rails, ties and posts from abandoned workings is done by careful foremen as soon as the workings are finished. If this is not done the material is lost altogether or recovered later only at an unnecessary expense to the company. In conclusion, the foreman must work hand in hand with his men, the mining department and his superintendent if he would prove himself to be an efficient mine foreman.

Mine Boss.

——, Ohio.

Stopping Payroll Leaks

Letter No. 7—I was much interested in reading the several letters in regard to stopping payroll leaks. The last one, Letter No. 7, by C. J. Fuetter, *Coal Age*, Aug. 7, p. 227, impressed me particularly.

In this letter Mr. Fuetter points out the loss that occurs when the bonding of the rails in an electric haulage system underground is left in charge of a mine foreman who gives the matter no thought or care. The reason is often because the mine foreman desires to make a record for himself by cutting down his cost-sheet, not caring, as Mr. Fuetter suggests, that he is thereby creating a much heavier expense in the powerhouse, the blame for which he knows quite well will be laid to another man's charge and he will escape.

It stands to reason that the greatest success can be obtained in mining operations, only when every man works in the company's interest and considers that above everything else. It is up to the operator to discover the foreman who is trying to make a record for himself by piling up expense on someone else. Such a foreman will always leave the mine in a worse condition than he found it when he assumed charge. While we cannot expect every mine foreman to be a mining engineer or an electrician, we may expect mine operators and superintendents to see that the work is so divided among the different department heads that it will be performed intelligently and with the least expense of time, labor and money. Such a division of the work would require that all electrical equipment shall be under the supervision of a competent electrician. In other words, the entire work of the mine should be classified and put in charge of those who understand its performance.

The suggestion that friction would result from the electrician having charge of rail-bonding underground, because of a supposed conflict of authority between him and the mine foreman, will not apply if both of these men understand that the success of one means the success of all and that the failure of one means the failure of all. If this is true the only thing that remains to be done is to coöperate, each man working to the advantage of the other. By so doing he serves the best interest of the company and, incidentally, advances his own interest by reducing the general expense and making the work of mining more successful.

There is perhaps no one feature that increases the expense of operation to a greater extent than the lack of harmony and coöperation on the part of employees, especially the heads of different departments of the work. It often happens that jealousy arises between two department heads, and as a result they pull against each other and strive continually to find ways in which they can work to the other's disadvantage. At times we find a superintendent who encourages this spirit, calling it "competition." In my opinion, it is not competition, but should be regarded as a "trouble breeder." In the end it will bring disaster to the hopes and ambitions of one or both of the parties concerned. A jealous spirit breeds discontent. To illustrate, I want to recite briefly one instance that came under my observation:

At a certain mine, the inside foreman in charge had worked up from a driver to his present position. In the same company, the store manager came from a business college where he obtained his education. The trouble began when Mrs. Store Manager discovered that Mrs. Foreman was born and reared in a mining camp, and promptly cut her acquaintance, with the result that Mr. Store Manager soon discovered that Mr. Foreman had formerly driven a mule and, indeed, dug coal for a living. The gap thus opened widened rapidly, and the store manager found opportunity to disparage the work of the foreman by making some of the miners believe that the foreman had reported short time for them. The foreman retaliated in short order by stopping certain of the men from going into the mine, because they had been detained at the store when buying their oil and were a few minutes behind the time for starting work. To make a long story short, both men lost their positions, as a result of their personal controversy. Both of these men were well fitted for the positions they occupied, but they did not coöperate, and instead of creating harmony they preferred discord. In their efforts to discredit each other they delayed the work and injured themselves. One of the principles of all successful business is the harmony and mutual good-will of everyone concerned. What is the good for one is the good for all.

Before closing I want to mention one other point where loss to the company results. I refer now to waste of material taken into the mine. A dozen cross-bars are sent into the mine, and part of them are used, while the remaining two or three are thrown to the side of the road and forgotten or covered with refuse and lost. When more timber is needed another lot is ordered from the surface. Frequently, longer timber is sent down than is ordered or can be used. The miner saws off the ends of the sticks and throws them back in the waste when these could often be split up for cap pieces. The same waste occurs in rails, ties, car-wheels, track-splices and spikes, brattice cloth, and many tools. This all means a great loss when summed up for the year. I knew of one mine that maintained a storage track in a place 18 ft. wide, where all left-over material was taken and stored, and this material was used from time to time as needed.

As to the suggestion made in Letter No. 5, July 10, p. 61, to the effect that money spent at the right time and in the right way will often save a great expense at some later period, it is up to the foreman to determine what is necessary and where he can save future expense and avoid loss of coal, by doing certain work at the right time. The company pays its foreman for certain knowledge on his part, and he must always study the conditions carefully.

Assistant Foreman.

Bevier, Ky.

* * *

Study Course in Coal Mining

By J. T. Beard

The Coal Age Pocket Book

Area of Triangles—The area of a triangle is equal to one-half the product of its base and altitude. In this sense, any side of a triangle may be taken as its **base** and the **altitude** is then the line drawn from the apex of the opposite angle perpendicular to the base or the base extended.

In a **right triangle,** one of the sides about the right angle is generally considered the base and the other is then the altitude. Hence, the area of a right triangle is one-half the product of its two sides.

In finding the area of triangles other than right triangles, it is generally necessary to first calculate the altitude separately. In the two following cases, however, the area of the triangle can be found directly by the formulas given:

1. When two sides and the included angle are given:

$$Area = \tfrac{1}{2}\,(ab \sin C)$$

2. When one side and any two angles are given, it is then possible to find the third angle by subtracting the sum of those given from 180 deg. and apply the formula

$$Area = \frac{a^2 \sin B \sin C}{2 \sin A}$$

Example—(a) Find the area of a triangular field when two of its sides measure 600 and 450 ft., respectively, and the angle between them is 30 deg. (b) Find the area of the same field, when the given parts are: a = 600 ft.; B = 46° 56′ and C = 30°.

Solution—(a) Sin 30° = 0.5; hence the area of the field is

$$Area = \tfrac{1}{2}\,(600 \times 450 \times 0.5) = 67{,}500\ sq.ft.$$

(b) The third angle, not given, is A = 180° — (46° 56′ + 30°) = 103° 04′; and the known parts are

$$\begin{aligned} a &= 600 \\ Sin\ A &= \sin 103^\circ 04' = \sin 76^\circ 56' = 0.97411 \\ Sin\ B &= \sin\ 46^\circ 56' = 0.73056 \\ Sin\ C &= \sin\ 30^\circ = 0.5 \end{aligned}$$

Hence, the required area of the field is

$$Area = \frac{600^2 \times 0.73056 \times 0.5}{2 \times 0.97411} = 67{,}500\ sq.ft.$$

Quadrilaterals—The quadrilaterals, or four-sided polygons, include rectangles, parallelograms, trapezoids and trapeziums. The area of the first two of these classes is equal to the product of the base and altitude.

The area of a **square** is the square of one side.

The area of a **rectangle** is the product of two adjacent sides, one being the base and the other the altitude.

The area of a **parallelogram** is the product of one of its parallel sides, called the "base," and the perpendicular distance between them, called the "altitude."

The area of a **trapezoid** is the product of the half-sum of its parallel sides and the perpendicular distance between them. The longer of the two parallel sides is the base and the perpendicular distance the altitude.

The Coal Age Pocket Book

The area of a **trapezium** is found by drawing a diagonal between two opposite angles, thus dividing the trapezium into two triangles, the sum of whose areas is equal to the required area of the trapezium.

Regular Polygons—The solution of regular polygons is based on the following formulas:

Let a = area of polygon;
o = perimeter of polygon;
l = length of one side;
n = number of sides;
R = radius of circumscribing circle;
r = radius of inscribing circle;
α = angle at center subtending one side.

Then, by the principles of geometry,

Central angle, $\alpha = 360/n$ (1)

Side, $s = 2\,R \sin(\tfrac{1}{2}\alpha) = 2\,r \tan(\tfrac{1}{2}\alpha)$ (2)

Perimeter, $o = ns = 2\,nR \sin(\tfrac{1}{2}\alpha)$
$= 2\,nr \tan(\tfrac{1}{2}\alpha)$ (3)

Area, $a = \tfrac{1}{2}\,ro = nr^2 \tan(\tfrac{1}{2}\alpha)$
$= nR^2 \sin\cos(\tfrac{1}{2}\alpha)$
$[\sin\cos(\tfrac{1}{2}\alpha) = \tfrac{1}{2}\sin\alpha]$ $= \tfrac{1}{2}\,nR^2 \sin\alpha$ (4)

Circumscribing radius, $R = \dfrac{s}{2\sin(\frac{1}{2}\alpha)} = \sqrt{\dfrac{2\,a}{n \sin\alpha}}$

Inscribing radius, $r = \dfrac{s}{2\tan(\frac{1}{2}\alpha)} = \sqrt{\dfrac{a}{n \tan(\frac{1}{2}\alpha)}}$
$= R\cos(\tfrac{1}{2}\alpha)$

Note—The radius of the circumscribing circle furnishes the means of locating graphically the center of the polygon, which lies at the intersection of the arcs described by this radius from the apices of the polygon as centers.

Example—Find the central angle subtended by one side, the length of a side, the perimeter and area of a regular pentagon inscribed in a circle whose diameter is 50 ft.; also the radius of the inscribed circle.

Solution—A regular pentagon is a plane figure having five equal sides and angles. Then, since the radius of the circumscribing circle, in this case, is R = ½ × 50 = 25 ft., we have

Central angle, $\alpha = 360 \div 5 = 72\ deg.$

Length of one side, $s = 2 \times 25 \sin 36^\circ = 50 \times 0.5878 = 29.39\ ft.$

Perimeter, $o = 5 \times 29.39 = 146.95\ ft.$

Area, $a = \tfrac{1}{2} \times 5 \times 25^2 \sin 72^\circ$
$= 1562.5 \times 0.95106 = 1486+\ sq.ft.$

Inscribing radius, $r = 25 \cos 36^\circ = 25 \times 0.809 = 20.225\ ft.$

Inquiries of General Interest

Sampling Shipments of Coal

I read with much interest the questions of R. T. M., and the reply thereto, in regard to "Standards in Analyzing Coal," *Coal Age*. Aug. 28, p. 353. This prompted me to inquire further whether the United States Government engineers have ever adopted a standard method of sampling shipments of coal, which of course is the first and most important step to determine its quality and fuel value. Since the consumer is not interested in knowing what the coal analyzes by taking a straight-cut sample from the coal in place, it would seem that the proper method to adopt, so far as he is concerned, would be to sample the coal after it has been loaded for shipment. I do not believe that a fair sample can be obtained by driving a pipe through the coal from top to bottom, or by cutting a channel on top of the load the full length of the car, or by collecting a sample here and there from the top of the car.

SUBSCRIBER.

Gallitzin, Penn.

In Technical Paper 76, entitled "Notes on the Sampling and Analysis of Coal," by A. C. Fieldner, the Bureau of Mines, in addition to explaining in detail its method of collecting samples from the mine, discusses "The Relation of Mine Samples to Commercial Shipments." On page 13 the author states: "In drawing deductions from the mine-sample analysis, in regard to the quality of coal shipped from the mine, due allowance must be made for the larger proportion of impurities that may be included in the commercial operation of the mine."

It is generally recognized that in the mining, handling and loading of the coal for shipment it is practically impossible to prevent the inclusion of more or less foreign matter, and the author of Technical Paper 76 concludes that the mine-sample analysis, therefore, usually indicates a better grade of coal in respect to the ash content and heating value of the coal than is true of the commercial shipments.

Bulletin 63 of the Bureau of Mines, entitled "Sampling Coal Deliveries," draws attention to the same difference between mine sampling and the sampling of commercial shipments. In the purchase of coal for the Government it was recognized that the specification should include a definite commercial procedure in sampling shipments; and as a result of a conference the method adopted was outlined and included in the printed specifications.

The details of this method of sampling are given on pages 56 and 57 of the same bulletin. This consisted, practically, of taking shovelfuls from the shipment while being unloaded. Thus, small increments of from 10 to 30 lb. were taken at regular intervals during the time of unloading, so that a gross sample of 1000 lb. was obtained. This gross sample consisted of small and large sizes, and was later crushed and reduced in the usual manner to a convenient sample for laboratory use. In the case of large-sized lumps a gross sample of 1500 lb. or more was taken. But the specifications state that for slack coal and for small sizes of anthracite, if the impurities do not exist in abnormal quantity or in size larger than ¾ in., a gross sample of about 600 lb. is sufficient.

⁂

Starting an Electric Motor

There is a question that I would like to see discussed or answered in *Coal Age:* Assuming an electric haulage locomotive of 500 volts capacity is standing with the controller wide open and that while in this position the trolley pole is raised to the wire, will the armature be burned out as a result? We all know that the instructions are to first see that the controller is closed, so that no current can pass, before raising the trolley pole to the wire. Then, when the trolley pole is in position and you desire to start the motor, open the controller gradually, passing it from point to point as the motor gains speed. While I have seen armatures burned out under conditions similar to those mentioned, I have never been able to satisfy myself fully as to the cause.

T. W. ENGLISH.

Oliphant Furnace, Penn.

If the controller is wide open when the trolley pole is brought in contact with the wire, there will be a sudden rush of current greater than that which the armature is designed to carry, and as a consequence the armature would then be burned out.

When current from the trolley wire passes through the armature, it meets with a certain resistance due to the resistance of the winding. If the current passing generates a torque greater than that required to overcome the friction of the journals and revolves the armature, there is at once created an electromotive force that is opposed to that transmitting the current. This "counter-electromotive force," as it is called, acts as an additional resistance to the revolution of the armature and reduces the torque. Therefore, to maintain the speed of revolution, more current must be supplied to the armature.

As the speed of revolution is increased, the counter-electromotive force also increases, and as a result, when a uniform speed of revolution has been attained, there is a resistance due to the counter-electromotive force that the current flowing through the armature must overcome in addition to the resistance in the winding. In other words, the torque required to overcome the frictional resistance of the journals and revolve the armature at a uniform speed is reduced by the counter-electromotive force set up in the field.

Now, it will be readily understood that if the entire current is permitted to pass through the armature by bringing the trolley in contact with the wire when the controller is wide open, there is no counter-electromotive force present; and—the resistance opposing the flow of the current through the armature being much less—a greater current flows through the winding than the carrying capacity of the wire will permit and a burn-out results.

Examination Questions

Tennessee Examination for Mine Foremen, Assistant Foremen and Firebosses

(Selected Questions)

Ques.—You have a wide room that is generating a considerable amount of marsh gas at the face. You decide to temporarily ventilate this room by a line of brattice, which you can run up either side of the room, but which can reach only to within 15 or 20 ft. of the face, on account of the shooting tearing it down. If the brattice is put on the right side of the room, the air will be intake behind the brattice and return in the room. If it is put on the left side, the air will be intake in the room and return behind the brattice. There is enough air, in either case, to dilute the gas so that the return will be harmless. On which side of the room would it be best to erect this brattice, in order to keep the room most clear of gas? State your reasons.

Ans.—The brattice should be erected on the right side of the room, so that the intake air will be carried up behind the brattice. The air current will then be directed with greater force against the face and will sweep the entire face of the room, which is important in order to prevent any accumulation of gas in the corners of the room where the air does not strike. Again, if the brattice was to be erected on the left side of the room so as to conduct the return current out of the room, its area would require to be much larger than before, because of the increased volume of the return current, due to the presence of the gas. Also, there would be danger that much of the gas would eddy where it should enter the brattice on the return side. This condition could not occur if the brattice were erected on the right side of the room and there would then be less danger of gas accumulating in the room back a distance from the face, as when the entire room is swept by the return air. It is assumed that the wide room mentioned in this question is a double stall with the waste thrown back in the center of the room, there being a roadway on each side. The brattice is necessary here because the waste does not completely fill the space to the roof and the air does not reach the face.

Ques.—Referring to the last question, if you had succeeded in keeping the room clear of gas and a bad fall should occur in the face of the room, the roof falling so high that a quantity of gas continued to hang above the fall ahead of the line of brattice, how would you proceed to keep the space clear over the fall?

Ans.—It is difficult to answer this question without knowing the exact situation. However, in general, it may be said that in order to sweep the gas from above the fall, it will be necessary to erect a special form of brattice that will direct the current over the fall in such a manner as to carry away the gas.

Ques.—Explain what you understand by a "windy shot." What are the usual reasons or conditions that may produce such a shot?

Ans.—A "windy shot" is one that produces a more or less heavy concussion of the air so that it is felt at a considerable distance from the place where the shot is fired. A windy shot may result from an overcharge of powder, which causes the rupture of the coal before all of the powder has been burned. As a consequence, the powder remaining unburned when rupture takes place is largely exploded in the mine air. Practically the same thing may result with a normal charge of powder when the coal has been weakened or creviced by undue roof pressure or by the explosion of a previous shot. In that case much of the force of the shot is expended on the mine air as before. Under these conditions there often results what is known as a "squealer," this name being suggested by the shrill sound produced by the gases escaping through the crevices when the shot is fired.

A windy shot is not apt to be as dangerous as a blownout shot under the same conditions, because the heat and force developed are much less in the former case. A blownout shot is one in which the shot has blown its tamping without breaking the coal. In this case the flame and gases of the shot are projected from the hole with great force. A blownout shot may arise from a variety of causes, but is most frequently due to a "tight shot" where the charge is laid too deeply on the solid, or the shot is bound by projecting tops or bottoms in such a way that the powder cannot break down the coal. A blownout shot may be due to insufficient tamping or too large a diameter of hole for the charge of powder employed, in which case the force of the exploding powder is not sufficiently distributed in the coal to produce rupture, owing to the concentration of the charge.

Ques.—(a) About what velocity of air would you consider advisable in the main air courses, in order that the current shall be able to keep the working faces clear of gas, but so that fine dust will not be carried in suspension in the current or that there shall not be an excessive amount of friction? (b) What should be the sectional area of the airways in order to maintain this velocity and supply the above-mentioned amount of air? State the width and height of the airways.

Ans.—(a) The velocity of the main air current may vary from, say, 600 to 1000 ft. per min., without causing undue danger from the carrying of dust in suspension in the air. The velocity in any particular case, however, will depend on the conditions existing in the mine with respect to the fineness and the amount of dust present. On the other hand, as stated in the answer to the previous question, the air volume required for the entire mine will depend on the number of splits and the velocity required at the working face.

(b) Assuming, however, a total air volume of, say, 60,000 cu.ft. per min., the required sectional area of the main airway will vary from 100 sq.ft. for a velocity of 600 ft. per min. to 60 sq.ft. for a velocity of 1000 ft. per min., depending on the conditions as previously stated. These velocities of the air current will not produce an excessive amount of frictional resistance.

Coal and Coke News

Washington, D. C.

A phase of the recent coal decisions of the Interstate Commerce Commission that has thus far received comparatively little attention, but is likely to figure a good deal in the discussion of the situation is found in the data compiled to show the real freight revenue yielded to the anthracite coal roads from their coal business. Probably the work done by the Commerce Commission on this phase of the matter is as elaborate and detailed as, if not more so than, any other element of its inquiries.

The Commission takes as a basis of comparison in the matter of revenue the showing of revenue made by 69 carriers in the recent "five per cent. case" and presents an extensive compilation of the income derived from various items of freight by these carriers as follows (carload lots being taken as the basis of computation):

Article	Average Net Income per Loaded Car-Mile, Cents
Hemlock lumber	28
Hides	24
Brick, stone, etc.	22
Iron ores	20
Cement (in sacks)	22
Pulp wood	13
Sheep	7
Cattle	6
Hogs	7
Corn syrup	6

The foregoing is merely a selection of some of the highest and some of the lowest yields obtained from various commodities in a large group, results for which are presented by the Commission. With this representative showing for the commodities transported by the 69 well-known carriers taken as a basis may be compared the figures for the coal roads showing their revenue per loaded car-mile on all sizes of coal averaged.

Road (to Tidewater)	Rev. per Loaded Car-Mile, Cents
Pa. Ry. & Northern Central Ry.	23.07
N. Y., O. & W.	23.86
Reading	25.70
Erie lines	31.64
Lackawanna	32.86
Lehigh Valley	34.94
Jersey Central	41.05

To Buffalo (instead of tidewater) the net revenues are lower but were still substantial, most of them being well above 20c. Comparing the results with those for the 69 carriers above referred to, it is seen that the incomes on anthracite coal rank with the highest from any other commodity. In fact there is no road that presents a net revenue on anthracite coal, as indicated by these figures that is not materially above the great majority of the revenues for various commodities reported by the 69 carriers referred to as an average.

Further, as the Commission clearly shows, the present mode of hauling anthracite is in trains that transport the maximum train tonnage. Large tonnages hauled in these trains mean very high revenues per train-mile. Some of the figures compiled by the Commission to show comparative train-mile revenue may be stated as follows:

Road	Freight Revenue per Train-Mile
A. C. L. RR. Co.	$2.696
B. & O. R.R. Co.	3.474
C. & O. Ry. Co.	3.471
L. & N. R.R. Co.	2.295
N. Y. C. & H. R. RR. Co.	3.028
Virginian Ry. Co.	4.567
U. S. roads, as a whole	3.0228

As against this the Commission states that the revenue on anthracite coal earned from the mines to tidewater is per train-mile $19.30 for the Jersey Central; $16.14 for the Lehigh Valley; and $16.43 for the Lackawanna.

It has been suggested in some quarters that these figures are vitiated by the fact that the work of the anthracite coal roads is not confined to the hauling of anthracite but includes a large amount of other articles. How much weight must be given to this argument may be judged from a computation of data given by the Commission in an appendix and showing the proporation of total traffic over the coal roads furnished by the anthracite coal. Some of these figures are given as follows:

Road	Ratio of Coal to Total Tonnage, Per Cent.	Ratio of Coal to Total Freight Revenue, Per Cent.
Central RR. of N. J.	31.5	46
Phila. & Reading	24.4	32.6
D., L. & W.	41.9	49.8
Del. & Hudson	44.8	49
Lehigh Valley	45.5	50.5
N. Y., O. & W. Ry.	70.2	63.6
Wilkes-Barre & Eastern	80.9	85.9
N. Y., Susquehanna & Western	64.7	48.6

This shows the proportion of total operations in which anthracite coal figured and consequently indicates in some degree the extent to which the higher revenues carried on coal are characteristic of the general business of the coal lines.

Allowance is not made in the foregoing figures for the return movement of empty coal cars, the anthracite traffic being peculiar in that it is largely a one-way business. The inclusion of the empty movement makes a change in the mileage revenue returns but leaves them substantial, as may be seen from the following comparison:

Road	Revenue per Loaded Car-Mile, Cents	Revenue per Car-Mile, Including Empty Movement, Cents
Pennsylvania	23.07	11.56
Ont. & Western	23.86	11.96
Reading	25.70	12.85
Erie	31.64	16.41
Lackananna	32.86	17.72
Lehigh Valley	34.94	18.29
Jersey Central	41.05	21.22

From this showing the conclusion drawn by the Commission is that the returns drawn by the carriers from their movement of anthracite are "remunerative."

Improvements at Panama

Advices from the Isthmus show that material improvement is being made in methods of handling coal at Panama. A project has been approved by which several berths at the commercial piers at each terminus will be fitted with booms for using the conveyors in unloading cars into ships' bunkers. The four conveyors now in service are used on barges and bunker vessels at dock from the offshore side, and the new equipment will make it practicable to bunker vessels from both sides while they are discharging cargo. It is proposed to install two conveyors on both sides of Pier 8 at Cristobal, two on the front of wharf No. 9 and two on each side of Pier 7 when constructed. They will unload from a special type of car consisting of a Lidgerwood flat car built up with 5-ft. sides and ends, forming a compartment 38 ft. long which will hold from 45 to 50 tons of coal.

Dating from Sept. 1 the price of coal has been increased to $6 per ton at Cristobal and $7 per ton at Balboa.

HARRISBURG, PENN.

Preliminaries to the organization of the workmen's compensation system for Pennsylvania were arranged recently at a conference of the members of the new Workmen's Compensation Board and state officials with Attorney General Brown.

Harry A. Mackey, Philadelphia; J. W. Beech, Ebensburg, and John A. Scott, Indiana are the members of the Compensation Board and Insurance Commissioner Johnson, State Treasurer Young and Commissioner of Labor and Industry Jackson comprise the Insurance Board.

The organization of the insurance fund, for whose administration the state made an appropriation of $300,000 will be first. It will be laid out as soon as possible and men familiar with insurance matters will be placed in charge of various features. It is probable that within a few weeks the making of schedules, establishment of premiums and other details will be under way.

One interesting feature of the state's insurance fund will be an elaborate system of advertising of its advantages. This will be done through Smull's Legislative Hand Book, which will devote six pages to the fund, through folders and by placing of matter in envelopes sent on state business. The fund itself will be created out of the premiums paid by employees. The state will pay the expenses.

Part of the plan is to have men stationed in various cities of the state in charge of branch headquarters for business for the fund and these men will visit employers and explain the merits of the state system. According to inquiries made, several liability companies will be formed and some of the existing companies will also go after business of insuring employers.

PENNSYLVANIA

Anthracite

Mahanoy City—The Philadelphia & Reading Coal & Iron Co., through President W. J. Richards, of Pottsville, has donated to the people of Gilberton a strip of ground to be utilized as a playground for the children. The company is also furnishing teams and implements for placing the site in shape.

Scranton—Under a contract granted by the state, the Drake Drilling Co., of Hazleton, has begun the work of saving the state armory from destruction by mine caves. Settlings in the workings beneath the building two months ago allowed the foundation walls and sides to crack and little can be done to remodel the building until new foundations are placed on solid ground. Concrete pillars are to take the place of the present foundation walls and allowance will be made for further settling of the surface.

Pottsville—A coal case 43 years old was decided recently by the Schuylkill County Court. The decision gives the Lawrence Colliery Co. the right to remove all the coal under the tracks of the Reading railway company on the Mahanoy Plane, where the coal is hoisted over the mountain, providing some other support for the surface is provided. It releases coal estimated to be worth $1,000,000. The suit was originally brought in 1872 against Lawrence, Merkel & Kerr. When the partnership was dissolved the case was continued against Lawrence & Brown, the present owners. The questions were decided by lower and Supreme Courts at the time and in 1873 another case was started. Evidence was taken before C. F. Shibe, the master, 13 years later, but he died before rendering a decision, being followed by F. W. Bechtel, who also died before deciding the case. Then ex-Congressman J. B. Reilly was appointed, and his work of the last several years was approved by the court on Sept. 6. In making the decision the court found it necessary to review 8,000 typewritten pages of evidence.

Summit Hill—Steam issuing from a point near the concrete wall erected by the Lehigh Coal & Navigation Co. to check the fire which has been burning for upwards of 60 years, indicates that the progress of the fire is now such as to determine whether or not it is going to be checked by the barrier erected for that purpose. For over a year stripping operations have been going on near the wall and the work is now being prosecuted with such energy that about 300 cars of coal are being taken out daily. Great hopes are entertained that the fire will not pass the wall, but if it does it is thought that the stripping operations have progressed to a point where the fire may be extinguished. This fire has cost the company several millions of dollars in coal and the efforts to check it.

Bituminous

Blairsville—Coal operators about Tunnelton, White and Foster are looking for men. While men for all classes of work are wanted the crying need is for miners. Italians, Lithuanians, Austrians, Hungarians and other foreigners, whose governments are at war, have quietly disappeared from this territory and none have come to fill their places. Several mines in Josephine are now rushed with export coal orders which must be filled in a stipulated time. In Clearfield, Clarion and Westmoreland Counties 2,500 miners and an additional 1,500 laborers can find employment in the coal mines and wages are today better than for years. Export orders for quick delivery are now coming from all parts of the globe, especially for steam coal, but many coal operators, it is reported, are compelled to refuse them on account of shortage of men.

Connellsville—A cargo of 5,800 tons of coke, manufactured by the Consolidated Connellsville Coke Co., was shipped recently to private interests in Italy. The sale was made through jobbers so the manufacturers do not know the real consignees. The Tower Hill plant No. 2 is being put in first class running order as is also Thompson No. 2 plant. The Rainey interests are gradually adding more ovens at their Allison plants. The Orient plant has been placed in running order and is waiting the price which it is felt will come before putting the ovens in full. Altogether conditions for the latter quarter of the year are very good with extraordinarily flattering prospects for the workers and merchants of the community.

Scottdale—Word has been received at the Scottdale offices of the H. C. Frick Coke Co., that the awards have been officially fixed by the superior jury of the Panama-Pacific International Exposition to cover the exhibits of the United States Steel Corporation and its subsidiary companies and among these awards is one to the H. C. Frick Coke Co., as follows: Medal of honor for combined exhibit including a model of a modern coal and coke plant, relief map of the Connellsville region and 9 ft. channel section representing thickness of coal seam, also samples of coal from mines. Also for five simple cubes showing character of coal from the mines of the U. S. Coal & Coke Co., the Bunsen Coal Co., and the National Mining Co.

California—The Vesta Coal Co., at its Washington County, Penn., plant will shortly begin the construction of what is said to be the longest mine siding in the world, now nearly three miles in length and which will be extended from the pit mouth a distance of over 5,000 ft. back into the hill. The construction of this siding is for the purpose of handling the coal on the tipple to better advantage. The track will accommodate the storage of more than 500 cars and will be double tracked, one track for loaded cars and the other for empties.

Uniontown—The existence of fires of threatening proportions in several of the abandoned mines of Fayette County, Penn., raises the question as to who is responsible for extinguishing them. Mine fires are never easy to extinguish and the bigger they are the heavier the undertaking becomes. Mine fires in this region have been known to burn for years in spite of continued efforts to quench the flames and the destruction wrought has not always been confined to the property of the mine owner, but has spread to adjoining properties. Most mine fires menace other property than that of the owners of the mine and there arises the question of public duty in such a case.

WEST VIRGINIA

Wheeling—Following an inspection by state officials, the mine of the Elm Grove Coal Co. was recently ordered closed. It is alleged that the mine is not properly wired, and several other changes have been recommended. This is one of the oldest mines in the Wheeling district.

Morgantown—The Mine Extension Department of the West Virginia University last year had one man doing field work. This year three men have been sent out, each having a certain district in which to work, including about five regular mine districts. These men will establish 10 points where demonstration classes will be conducted, each place being visited every two weeks. In many instances these classes will be conducted under the auspices of the Y. M. C. A. or organizations maintained by the coal company.

Coal operators of southern West Virginia assert that the increase in rates on coal shipments to points west of the Mississippi River will be highly injurious to the coal industry of this state. These operators favor concerted action to oppose such rates.

Thomas—The Davis Coal & Coke Co. will start its new plant near Bloomington within a few days. A boiler and power house have been erected on Savage River for the old Buxton mine. This plant will have a daily output of about 800 tons. Coal activities are increasing in the Fairmont field, and by the first of October it is believed that the coal business will be as brisk as it ever was in that section.

Powhatan—The coal tipple of the Powhatan Coal & Coke Co. was destroyed by fire late Sept. 8, resulting in a loss estimated at $35,000 to $40,000. The structure was insured. The origin of the fire has not yet been determined. Plans are being drawn to erect a modern steel tipple with the most modern machinery. Work will be resumed in a few days, a temporary chute being erected immediately for loading cars. Only run-of-mine coal, however, will be loaded by this means.

VIRGINIA

Bristol—Unusual activity is reported to exist in the coal-mining industry in eastern Kentucky and southwest Virginia. One coal mining company is advertising for 1,500 additional miners, while many coal-producing firms are making extensive improvements. It is believed that the movement of coal for export from this region will be heavy when the docks at Charleston are completed.

ALABAMA

Birmingham—The Sloss-Sheffield Steel & Iron Co. recently requested the City Commission for permission to light the coke ovens near its furnace. This matter was taken under advisement by the City Commission, and no definite action is expected for a few days.

KENTUCKY

Artemus—The Dean Coal Co., whose mines have been closed since last February, will reopen Oct. 1. They are operating in the Dean seam.

Sebree—The Jefferson County Bank, Birmingham, Ala., purchased the Sebree coal mines at a court sale recently for $8,880. The purchase will not affect the present management, the Sebree Mining Co., which will continue to operate the property under lease.

Paducah—A conference of western Kentucky coal operators and Illinois Central traffic officials was held here recently for the purpose of considering a proposed advance in freight rates to Jackson, Natchez, Vicksburg and other Mississippi Valley cities. It is asserted that the advance would give Alabama coal an advantage of 30c. in reaching the markets referred to, and would shut out western Kentucky coal. The operators will lay the case before the Interstate Commerce Commission.

OHIO

Steubenville—The plant of the Dexter Coal Co., near this city, which was equipped several years ago at a cost of $125,000, has been sold by the receiver under order of the United States district court to George C. Watt, of Braddock, Penn., at his bid of $9,100. The purchaser will operate the plant, it is announced.

Bellaire—All records were broken Sept. 9 at the Rail & River Mine No. 1 for a single day's output. Approximately 2560 tons of coal were delivered to the tipple, which is believed to be not only the record for this individual mine but also for the county.

St. Clairsville—Three coal miners recently filed suit against the Purseglove-Maher Coal Co. to recover wages claimed to be due them for work from Aug. 1 to 25. This is a test case and is the outgrowth of conditions arising during the strike when for a long period the employees of the coal company lived in the company's houses and dealt at the company's store becoming deeply indebted thereto. Instead of now paying the men their wages in cash, the company is giving them receipts for rental and grocery bills. The suit is filed on the ground that not more than 10 per cent. of the wages of a married man may be attached.

INDIANA

Boonville—The Hartwell Coal Co., operating in Pike County, Ind., is reported to have plans for resuming operations in the immediate future. The company controls 2,400 acres of coal lands.

ILLINOIS

Muncie—A suit has been filed in the circuit court by the Pocahontas-Winifrede Coal Co., of Huntington, W. Va., asking for the appointment of a receiver for the T. L. Westlick Coal Co.

Danville—The Illinois Central R.R. Co. recently filed in the Federal Court here a petition asking that a restraining order be directed against the Interstate Commerce Commission. This case is the outgrowth of the coal service in September, 1913, when the Groom Coal Co., the Vulcan Coal & Mining Co., and the St. Louis-Coulterville Coal Co., asked the Commission to assess damages against the railroad company. The railroad company asked that the case be tried in the court at once. The alleged shortage of cars in the coal district caused repeated complaints to be made to the State Service Commission and the Interstate Commerce Commission; the latter body finally began an inquiry.

Belleville—Thomas C. Wright, St. Clair County Mine Inspector, has filed his annual report. He says that the 69 mines in the county for the 12 months ending Aug. 31 produced 3,017,820 tons of coal, a decrease of 1,099,182 tons from the previous year. The total of men employed for the last year was 3,944 against 4,738 for the previous year. There were 34 non-fatal accidents in the year against 55 for the previous year. Five men were killed during the year. There are 36 shipping mines in the county but 17 of them did not operate because of business conditions in the district. The shipping mines under operation averaged 145 days during the year and the local mines 180 days.

COLORADO

Hayden—The Victor-American Fuel Co., which several months ago purchased a ranch near Hayden, Colo., is laying off a townsite there. It is near the coal tract adjoining the Harris mine.

Denver—The Victor-American Fuel Co. has filed with the secretary of Colorado a reservation of the name The Colorado Coal Co. It is said that the company wishes to hold the name for the purpose of using it in connection with a mine which it will open in the future.

Representatives of the coal companies of Colorado met recently with the state industrial commission to discuss the rate of insurance to be charged the coal operators under the Workmen's Compensation Act and other features of the law which concern the coal companies. The operators declared that a 7 per cent. insurance rate would put most of the small companies of the state out of business. S. M. Perry, president and general manager of the Leyden and Moffat coal companies stated that one of their mines would have to close immediately.

Durango—Federal Judge Trieber, sitting in the absence of Judge Robert E. Lewis at Denver, Colo., recently dismissed the indictments filed more than 8 years ago against the Porter Fuel Co. for alleged conspiracy and fraud in obtaining approximately 2,790 acres of rich coal lands near Durango in La Plata County. These lands now belong to the Union Pacific Coal Co. and are valued at more than $500,000. There has never been any question concerning conspiracy in relation to the Union Pacific Coal Co. This is one of the most famous cases ever tried in Denver.

FOREIGN NEWS

Vancouver, B. C.—Announcement was recently made that the Attorney-General of British Columbia had laid indictments for manslaughter against Thomas Graham and J. H. Tonkin, charging them with carelessness in connection with the disaster which caused the loss of 19 lives in the Reserve mine near Nanaimo on Feb. 15 last. Graham is Chief Inspector of Mines for the Provincial Government, while Tonkin is manager of the Pacific Coast Coal Co. A blast in the Reserve mine broke the barrier wall separating it from the old workings of the South Wellington mine, which had long been flooded with water. This break in the barrier caused the death of 19 miners by drowning.

PERSONALS

Edward H. Coxe, mining engineer, of Knoxville, Tenn., left recently for a trip to Denver and the coal fields of Routt County, Colo.

Thomas L. Lewis, former president of the United Mine Workers of America, is now a salaried employee of the West Virginia Coal Operators' Association, with an office in Charleston, W. Va.

J. R. Fleming, of Bear River, Routt County, Colo., has resigned his position as local manager for the Bear River Coal Co. of that place, and, as soon as his successor is appointed, will remove to Utah to look after coal interests that he has in that state.

David Reese, for many years connected with the Victor-American Fuel Co. at Hastings, has been appointed a member of the Colorado state board of coal mine examiners by Judge A. W. McHendrie, of the third judicial district, empowered by statute to appoint one member.

Benjamin B. Thayer, president of the Anaconda Copper Mining Co., and William L. Saunders, chairman of the board of directors of the Ingersoll-Rand Co., both members of the American Institute of Mining Engineers, have been appointed to the Naval Advisory Commission.

J. C. Roberts, of the U. S. Bureau of Mines, has had a corps of men working at the top of Pikes Peak, Colo., with appliances for mine rescue work. He has made a number of important and interesting tests in that high altitude, but is not ready yet to make his discoveries public.

L. W. Brown, superintendent of the Richland Coal Co. of South Warwood, W. Va., has left for Bolivia, South America, where he will open a tin mine for West Virginia capitalists. The tin deposits in question are 12,000 ft. above sea level, and a railroad is projected to reach these mines.

Perry Barker, fuel engineer, has opened an office and laboratories in the Oliver Bldg., 141 Milk St., Boston, Mass. He is equipped to be of service to both dealers and consumers and will make investigations, tests and reports on the preparation and use of coal and coke for various purposes.

Messrs. Joseph J. Keegan and Hilliard J. Rosencrantz are in charge as managing directors of the Far Eastern Division of Gaston, Williams & Wigmore, Inc., of 140 Broadway, New York City. This division has been organized and equipped to develop markets for American industries in the Orient.

C. E. Bullard, who has for the past four years been cashier of the Carter Coal Co. at Warren, Ky., has been promoted to the superintendency of the Carter Coal Co. at Anchor, Ky. Prior to his connection with the Carter company in Kentucky, Mr. Bullard was chief clerk to the general superintendent of the Virginia Pocahontas Coal Co. at Coalwood, W. Va.

W. W. Hall, who has been salesman for the George D. Whitcomb Co., of Rochelle, Ill., with office in the Blackstone Bldg., Ashland, Ky., has resigned his position with that firm and taken the sales management of the Ironton Engine Co., Ironton, Ohio, which company is going to manufacture a complete line of coal mining machinery, making a specialty of coal cutting and hauling machinery.

Herbert M. Wilson, director of the Department of Inspection and Safety of The Associated Insurance Companies, formerly of the Bureau of Mines, will be in San Francisco, Sept. 16 to 25, participating in the various engineering congresses. He will be actively concerned in the first-aid and mine-rescue demonstrations and contests of the Board of Managers, of which he is chairman. He is also scheduled to read papers on mine safety and on workmen's compensation before the mining sections of the International Engineering Congress, the American Mining Congress, and the World's Insurance Congress. Going to and coming from the Pacific Coast, Mr. Wilson will visit various coal mining states for the purpose of perfecting arrangements for inspection of mines for insurance by The Associated Companies under workmen's compensation.

OBITUARY

Louis Florien DeSaulles, 69 years of age, died at his home in Uniontown, Penn., Sept. 6, as the result of a bullet wound in the head, self inflicted. Mr. DeSaulles was born in New Orleans in 1846 and at the outbreak of the war young DeSaulles and his mother went to France where the mother still lives at Pau, being 98 years of age. At the close of the war Mr. DeSaulles returned to America and engaged in business and later came to this section of Pennsylvania where he became interested in the development of Fayette County coal. He and the late George Marshall and others opened one of the first coke plants in the county at Percy. This has long since been worked out and abandoned but many of the present day leaders in coal and coke operations in this section served their apprenticeships under Mr. DeSaulles when the plant at Percy was in its prime.

Ernest H. Abend, principal owner of the Abend coal mine, one mile north of Belleville, Ill., in which city he resided, was found dead recently at the bottom of a 150-ft. shaft in his mine. He was 54 years of age, wealthy and unmarried. The circumstances of his death are unknown. Two theories are advanced: One that he lost his balance while making an inspection; the other that he walked into the shaft after lifting the safety gate. The elevator was at the bottom of the shaft. Mr. Abend had gone to the mine, as had been his daily custom since the recent extraordinary rains, to inspect the work of the men operating the pumps. On reaching the mine he had a conference with Frank Oexner, his chief engineer, and left him to go into the mine. A few minutes later Foreman Martin Kirkwood, at work near the bottom of the elevator shaft, heard an object strike the elevator and upon examination found Mr. Abend's body.

INDUSTRIAL NEWS

Henrietta, Okla.—The Junior Coal Co. is installing a large Bucyrus steam shovel.

Henrietta, Okla.—The Fidelity Fuel Co. is planning to sink two new shafts in the near future.

Bellaire, Ohio—It is asserted that the Pittsburgh Vein Coal Operators' Association is considering the matter of moving its headquarters from Wheeling to Bellaire. It is believed that decisive action on this matter will be taken in the near future.

Springfield, Ill.—On Saturday, Oct. 2, an examination will be held at various towns in Illinois to fill several positions in Illinois Civil Service. Among these is a chief clerk of the Mining Board. This is open to men over 25 years of age and carries a salary of $125 to $175 per month.

Charleston, S. C.—The "International," the first coal boat of the Clinchfield Navigation Co., has been loaded with coal at Charleston. It is understood that this is the first of the fleet of vessels which will be operated by the Clinchfield Navigation Co., in handling export coal from this port.

Hartford, Conn.—The S. K. F. Ball Bearing Co. of Hartford, Conn, was recently organized with a capital stock of $2,000,000. The object of this organization is the manufacture and sale in this country of the ball bearings of this name, these heretofore having been all imported from Sweden.

Pittsburgh, Penn.—Record-breaking coal shipments to the Duquesne docks of the Monongahela River Consolidated Coal & Coke Co. were recently made from the company's mines along the Monongahela River. These shipments were for steel mills and are said to have been 2000 to 3000 tons per day in excess of former shipments. Five towboats were employed.

Huntington, W. Va.—If the first few days of the month are a criterion, all coal-loading records of the Chesapeake & Ohio R.R. will be exceeded in September. The total tonnage of coal handled during August was 2,423,000 tons, and it is believed that during September this will be increased to 2,450,000 tons. This would exceed all previous coal loading tonnages.

Charleroi, Penn.—The biggest monthly shipments of coal since October of 1913 are reported by the lockmaster at Lock No. 4 on the Monongahela River, in his report for the month of August. There were 446 lockages upstream, including 319 steamboats, 1,533 barges and flats. Downstream the traffic was 450 lockages, 318 steamboats, 1,564 barges and flats and 19,638,000 bu. of coal. In October, 1913, the total shipments of coal were 19,933,000 bu., which is but slightly above the August record of the present year.

Baltimore, Md.—The report on coal mining in Maryland during the fiscal year ending May 1 has just been made to Governor Goldsborough. The report shows a total of 3,888,611 tons mined during the period, a decrease of 551,033 tons from the tonnage of the same period of the year previous. A total number of 5,480 persons were employed in coal mining in the state, a decrease of 79. Decreased tonnage was blamed on the partial or complete shutdown of mining properties from time to time as a result of poor demand generally for fuel.

Bluefield, W. Va.—The total tonnage handled by the Norfolk & Western R.R. during the month of August was coal, 2,934,000 tons; coke, approximately 74,000 tons, which brings the total fuel shipments of the road to over 3,000,000 tons. The prospects are bright for the coal tonnage alone passing the 3,000,000 mark during the month of September. The recent installation of the electric system has aided materially in handling this immense tonnage, a large portion of which has been eastbound, the foreign trade being exceptionally heavy.

Connellsville, Penn.—The Connellsville coke region is now operating at approximately 75 per cent. of its rated capacity, and production has risen to over 390,000 tons per week. The wages being paid are the highest in the history of coking. It has been estimated that within the past few weeks the Pittsburgh district has been forced to decline export steel orders amounting to 300,000 tons, the mills having orders sufficient to keep them running to capacity for the remainder of the current year. Domestic needs are also increasing, and it is estimated that purchases of railroad supplies during the remainder of 1915 will be 30 per cent. larger than for any corresponding period in the past two years.

Columbus, Ohio—Readjustment of bituminous coal freight rates which would give to Ohio coal producers an increased differential, it is stated has been agreed to by the railroads operating in Ohio, West Virginia, and Pennsylvania. Officials of these roads, at a recent conference, decided to file with the Interstate Commerce Commission the new schedule of freight rates on coal from West Virginia to all points in Ohio, Michigan, and Indiana, which, if approved, would fix a new differential in favor of Ohio coal operators at 40c. a ton, as against 25c., which has prevailed for some time. Ohio operators have long contended that under the existing rates they are unable to successfully compete with coal producers in West Virginia.

St. Louis, Mo.—The Lumaghi Coal Co. has received notice from the Illinois Public Utilities Commission that its complaint against the advance of 5½c. a ton in rates from the Illinois coal fields to East St. Louis, Madison and Granite City, Ill., had been overruled and that the advance would become effective Oct. 1. This will make the differential between shipments to this side and the east side of the river 20c., which was the figure for a number of years, but two years ago, when the Interstate Commerce Commission passed upon the application for increased rates, the advance to St. Louis became effective at once, making a rate from nearby mines of 57½c., while the rate of 32c. to east side towns obtained. The complaint against the advance within Illinois has made a differential of 25½c. during this period.

Coal Trade Reviews

General Review

Unseasonably hot weather causes a sharp relapse in anthracite. Bituminous still benefiting by the general expansion in manufacturing. Export business continues to expand. Pittsburgh district consuming at a record rate. Lake tonnage larger.

Anthracite—The unexpected and almost unprecedented spell of hot weather has caused a sharp relapse in the hard-coal trade, which has subsided into as dull a situation as prevailed during mid-summer. It is clear that dealers' bins are stocked up close to full capacity, and this coal will have to start moving out to the consumers before any activity can be expected. The stimulus resulting from the brief period of cool weather a week ago has entirely disappeared, and business that was refused at that time is now being eagerly sought. However, it is evident that stocks in the consumers' hands are considerably below normal, shipments for the year to date being close to 2,000,000 tons less than the corresponding period last year, and any ordinary cold weather should start the coal moving rapidly.

Bituminous—The various constructive factors in the market still prevail and prices are fairly firm both for spot and forward delivery. Occasional market cargoes are difficult to move but as a rule the shippers are very conservative over future commitments, and there is increasing evidence that the export trade will prove a potent factor in the local market. The slow expansion in general industrial conditions is undoubtedly carrying the coal trade with it on to better things. The possibility of a car and labor shortage continue to be threatening features in the situation. Spot business is generally at a standstill but the movement on contracts is fair.

Exports—The export business continues fully up to the high average maintained last month, and there seems to be a tendency to advance prices in this direction. The demand from Europe is constantly increasing and it is becoming evident that foreign countries are being forced to rely more and more on this country for their fuel supply. Some accumulation of coal is occasionally noted at Tidewater but a number of the heavier shippers in the off-shore trade are having difficulty in keeping sufficient coal on hand to take care of the vessel tonnage as it arrives. The number of vessels bunkering is notably less, but the deficiency is probably made up by most vessels taking sufficient coal for the round trip. The growing scarcity of vessel tonnage continues the chief depressing factor in the export situation.

Lake Market—With the steel mills in the Pittsburgh district outputting a greater tonnage than ever before in their history, the coal consumption in this line is undoubtedly at a record rate. Railroads are also increasing their demand, which is now practically normal, and there is a generally good movement in all directions with indications of a steady though slow improvement. Prices have stiffened, and there is a tendency toward higher levels on new contracts, but no important increase can be expected until some such emergency as a car or labor shortage develops. Canada continues in the grip of a war paralysis with business generally at a standstill and the situation further accentuated by the violent fluctuations in the rates of exchange.

The domestic trade in Ohio has suffered severely as a result of the recent hot weather, although it is generally agreed that stocks in the hands of the consumers are light, and the return of colder weather will precipitate a sharp rush for coal. In steam lines the outlook continues optimistic. There has been sufficient business negotiated in some sections to develop a car shortage, which was distinctly noticeable. Large steam consumers are also showing a disposition to cover their requirements against a further price advance, and the railroads are accumulating substantial reserve supplies to provide for emergencies. Considerably less consignment coal is noted on demurrage than for some time.

A year ago.—Anthracite is slowing down to a more normal basis, but an active winter is anticipated. Bituminous is showing indications of heaviness in all directions. Export business relieves the tension at some points. Domestic grades are steadying up while steam sizes are in excess supply and weak.

BUSINESS OPINIONS

Boston News Bureau—In this country we seem to be near the point where we are going to progress far or fall back. On the outcome of the foreign loan depends the amount of our sales to the allies, for these will probably be gaged largely by the size of the loan. Loans of the present magnitude cannot be arranged without considerable detail. There are many differences of opinion which have to be adjusted, and yet the financial master minds of the world are on the job ,and the result is bound to be satisfactory. Pending the negotiations now going on the country will mark time. Success of the loan will mean great prosperity in the new world. The whole industrial force of the country will be busy. People will be profitably employed.

Iron Age—With steel-making capacity so largely taken up for 1915 the trade is daily making calculations for the early months of 1916. There is more evidence that the hand of the railroads is being forced by the size of the foreign inquiry for steel to be shipped after Jan. 1. It looks now as though the railroads will all at once want a good many cars and locomotives and that they will have to take their turn after buyers who have been more forehanded. Locomotive orders and inquiries have been larger in the past week than in months. Some car requirements are shaping up. In the case of the New York Central both rails and cars are up, and rails for fall and winter delivery are expected to be placed at Buffalo.

American Wool and Cotton Reporter—Quiet but firm was the tone of the wool market for the week under review. American houses whose representatives bid at the London sales are waiting to see if permits will be issued for the exportation of wool from England to this country. The woolen goods market seems very satisfactory. Very good purchasing has taken place on some high-price lines. A favorable development in the men's wear market is the keen demand for the last week or so, for delivery of stock merchandise.

Bradstreet—Trade trends continue upward; confidence as to the future is spreading, and while holidays as well as conservatism in some quarters have not allowed full rein to trade movements, the week has provided another budget of favorable factors. Withal, conservatism is not absent, and this manifestation is seen at a number of centers where visiting buyers show a disposition to purchase frequently in relatively small lots.

Dun—All restraining influences have not been eliminated, but developments that count for most in the business world continue mainly on the constructive side. International political relations, though less threatening, still have a disquieting effect, the foreign exchange problems are as yet unsolved and dissension in the ranks of labor remains a drawback in some directions. With abundant harvests, however, a full measure of prosperity is possible, and never before was the promise of the grain crops more brilliant than at the present time.

The Southern Lumberman—The first days of September have shown no radical changes in the yellow pine market. Little price fluctuation of any kind has occurred and mills are generally adhering closely to price lists published about the first of the month. Railroad demand is again the feature of the market, though call from the retail yards, particularly in the West and South, has also increased. Greater confidence in the business of the immediate future marks the hardwood trade this week. Demand for hardwoods, while without particular features, is steadily expanding as consuming factories again come into the market preparatory to supplying their own holiday and winter trade.

Marshall Field & Co.—Wholesale distribution of dry goods is maintaining a steady volume although not as large as a year ago, at which time the anticipated scarcity of foreign merchandise was resulting in large demand for imported lines. Our retail sales are heavy, although the warm weather has been unseasonable for the sale of fall merchandise.

ATLANTIC SEABOARD

BOSTON

Pocahontas and New River continue favorable, but with no significant price movement. Panama R.R. bids the most notable recent feature. Inquiry light but export trade counted on for fall business. Georges Creek and Pennsylvania grades unchanged. Freights easy and anthracite in favorable position.

Bituminous—Little change can be reported this week in the situation of Pocahontas and New River. The Panama R.R. bids are not regarded as particularly significant in their bearing on the market. The low figures were made by shippers who are ordinarily dependent chiefly on the coastwise trade where this year the demand has been only moderate from the beginning of the season. There is a feeling, too, among the Hampton Roads shippers that some one or two of the agencies should make quotations low enough to save the tonnage for the Pocahontas and New River fields and not allow Pennsylvania shippers to get a foothold on such a comprehensive order.

Meanwhile prices f.o.b. Hampton Roads are fairly firm for both spot and deferred delivery. The various factors still take a hopeful view of fall and winter trade, although the off-shore market is expected to furnish the major part of the demand. Inquiry here is very light but that the market is generally firm is apparent in the very few concessions now made from the regular $2.85 price.

On-car quotations are practically unchanged. Stocks are at a maximum in most directions and very few consumers are interested in the market. An occasional "market cargo" goes extremely hard and prices continue at a low range.

On Georges Creek there are no new features. The shippers are very conservative on commitments coastwise and share the expectation of other interests that the export trade will be unusually attractive. The two 8,000-ton ships being built for the Consolidation Coal Co. for Mediterranean service are soon to be put in commission.

The Pennsylvania grades are running on contract business, very little spot trade being developed. No change in prices can be reported. That some of the larger operators are actively out for comprehensive tonnages was shown in the Panama R.R. bids when Cambria coal was offered at from $2.53@2.60 f.o.b. Philadelphia.

Water Freights still turn upon the spasmodic inquiry for coal, although 75 @ 80c. is the prevailing range on barges 2500 tons upwards. Freights from New York to Providence and Fall River are 45c., with an occasional offering at 40c.

Anthracite—There is now a fairly steady demand for what coal the companies are mining. Protracted fog along the coast has delayed the movement of barges to such extent that many New England dealers are pressing for shipments. The trade appears to be in favorable position and when cooler weather has set in there is bound to be an improved demand.

Bituminous prices at wholesale are quoted about as follows:

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines*	$0.90@1.40	$1.15@1.65	$1.67@1.77	
Philadelphia*	2.15@2.65	2.40@2.90	2.92@3.02	
New York*	2.45@2.95	2.70@3.20	3.22@3.32	
Baltimore*	....	....	2.85@2.95	
Hampton Roads*	....	....	....	$2.80@2.85
Boston†	....	....	....	3.58@3.78
Providence†	....	....	....	3.50@3.73

* F.o.b. †On cars.

NEW YORK

Anthracite dealers optimistic. Prices on individual coals stronger and dealers are apprehensive. Bituminous situation unchanged. Labor and cars short. Much interest in European situation. Demurrage coals scarce.

Anthracite—While there has been no apparent improvement in the anthracite Tidewater situation over last week, dealers are optimistic and only await the first real touch of cool weather. The warm weather of the past week caused a slump in demand and many cargoes have been held up. Prices for individual coals are a trifle stronger but still far from companies' circular.

Much interest is being taken in the demands to be made by the anthracite mine workers as a basis for the new working agreement.

Wholesale dealers report many unfilled orders on account of well-stocked bins. However, a few cool days would relieve the situation greatly. Householders are gradually returning to their city homes and retailers are showing greater activity. Collections continue slow. Some coal men say the past few months have been the worst they have experienced in many years in that respect. The shortness of money continues to be a potent factor in the slowness of the market.

More improvement has taken place in the line trade than at Tidewater, but the demand is far from normal. Demand from New England is good.

Nut coal is a drug on the market and individual coal is easily obtainable at from 25 to 35c. off companies' circular. Egg and stove have been generally quoted at from 10 to 20c. below regular circular, but still lower prices have been heard. Demand for pea coal is on the increase and shipments continue prompt. The buckwheat grades, especially rice and barley, are moving freer and shipments are better.

Current quotations are as follows:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$5 05		$5.10	
Egg	5 30	$4 80@5.30	5 35	$4.90@5.35
Stove	5.30	4 80@5.30	5 35	4.90@5.35
Chestnut	5.55	5 00@5.55	5 60	5.10@5.60
Pea	3.50	3 25@3 50	3.55	3.50@3.55
Buckwheat	2.75	2 25@2 75	2.80	2.25@2.80
Rice	2.25	1.75@2 25	2.30	2.00@2.30
Barley	1.75	1.45@1.75	1.80	1.75@1.80

Bituminous—Shortage of labor and cars are the especial features of the soft-coal situation. Market conditions have improved slightly, so far as demand goes. There is not so much coal lying on the docks and some hurry-up orders have been received. However, there is plenty of coal for immediate shipment.

Interest in the demand from European countries is increasing. Exporters believe there is bound to be a shortage in the foreign markets and the American mines will be depended upon to make up the deficiency. New inquiries are being continually received and shipments are larger. Bunker requirements show improvement.

Soft-coal operators who are fortunate enough to have considerable of their output under contract are being kept busy. Large consumers are losing no time in taking their full requirements, and sometimes more. The railroads continue to store large quantities and some of the grades taken by them are practically out of the market. The car supply is tight owing to many of the smaller cars being used in the steel trade. Demurrage coal is scarce at Tidewater and there is not an oversupply of spot coals.

Current quotations are on the following basis:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3 20@3.30	$3 20@3 30	$3 20@3.30	$1.75@1.85
Georges Creek Tyson	2.90@3.00	2 90@3.00	2.90@3.00	1.35@1.40
Clearfield:				
Medium	2.65@2.80	2.55@2.65	....	1.10@1.25
Ordinary	2.55@2.60	2.55@2.60	....	1.00@1.15
Broad Top Mountain	....	....	....	1.10@1.45
Cambria County:				
South Forks	2.90@3.05	....	....	1.35@1.50
Nanty Glo	2.75@2.80	....	....	1.20@1.25
Barnesboro	2.65@2.70	....	....	1.10@1.15
Somerset County:				
Quemahoning	....	2.70@2.85	2.70@2.85	1.20@1.30
Medium	2.65@2.70	2.60@2.65	2.60@2.65	1.10@1.15
Latrobe	2.45@2.55	....	....	.90@1.00
Greensburg	2.75@2.80	....	....	1.10@1.15
Westmoreland	3.15@3.20	....	....	1.35@1.45
West Virginia Fairmont ¾		2.60@2.70	2.60@2.70	.80@ .90
Fairmont mine-run	....	2.45@2.55	2.45@2.55	.75@ .85
Steam	....	2.45@2.50	2.45@2.50	.90@ .95
Western Maryland	....	2.35@2.40	2 35@2.40	.85@ .90

PHILADELPHIA

Anthracite has relapsed back to the midsummer dullness, due to extreme heat. Prices again unsettled, especially on chestnut and pea. Individuals a growing factor. Bituminous shows gradual improvement. Good export tonnage, with tendency to higher prices.

Anthracite—The improvement noted last week has disappeared as suddenly as it came and the depression at this time is equal to the midsummer dullness. The conditions as to prices in the wholesale market are exactly the same as they were all summer. Business that was refused because of unsatisfactory prices last week is now being sought, and all the big companies report a woeful lack of orders, particularly for the local trade. The collieries were beginning to make good time, but there is not the least doubt that curtailment will take place at once.

Prices have been badly off circular, with the exception of stove, which is the popular size here and has held quite well. Egg coal, too, was fairly steady, but only because of the fact that the New England market continues to absorb a large proportion of this size. Chestnut is still the biggest problem, with no thought of anyone paying circular and with a price as low as April circular less tax on a good grade of coal. Pea also has lost the little strength it had last week, with offerings of any quantity of excellent coal at $1.85, and in several instances quotations as low as $1 65 have been noted.

The steam sizes are in plentiful supply, with buckwheat well taken care of. The other grades, however, especially rice, are very heavy, immense quantities going into the already large tonnage in storage. It is known that several of the larger companies are going to make special efforts this coming season to push the consumption of rice as a steam fuel in competition with bituminous. Collections are very slow, if anything more so than at any time during the summer.

The retail dealers are not asking the regular winter schedule for coal, as has been the usual custom at this time, but are offering deliveries at from 25c. to 50c. from the usual prices. The larger dealers, however, are asking the full winter prices and are extensively advertising their prices in the daily papers. The prices maintained by the larger companies, to which should be added the Pennsylvania state tax of 2½%, are as follows:

	Line	Tide		Line	Tide
Broken	$3.50	$4.75	Pea	$2.50	$3.25
Egg	3.75	5.00	Buckwheat	1.25	2.25
Stove	4.00	5.00	Rice	.85	1.75
Chestnut	4.15	5.25	Barley	.50	1.50

Bituminous—The improvement noted last week continues in most quarters. There is no spurt, but the betterment is gradual, indicating that it will be continuous along with the constantly improving industrial situation. As evidence of this the Pennsylvania R.R. reports that every car in good repair is now in service, and all the railroads are showing an increased bituminous tonnage. The car supply continues to be a factor, although not as yet serious. There have been no important price changes during the week, although large shipments to Lake ports still have a tendency to make all slack grades strong. The export business continues in good volume, with inquiries up to the average of last month, and there also seems to be a tendency to get a better price on new orders. Vessel tonnage is still unable to meet the demand, with the result that a number of clearances have recently been made of sailing vesels for trans-Atlantic ports.

The price situation is well represented by the following average quotations current this week:

Georges Creek Big Vein	$1.65@1.75	Fairmont gas, ¾	$1.20@1.30
South Fork Miller Vein	1.50@1.60	Fairmont gas, mine-run	1.05@1.15
Clearfield (ordinary)	1.00@1.20	Fairmont gas, slack	.70@ .80
Somerset (ordinary)	1.00@1.15	Fairmont lump, ordinary	.90@1.00
West Va. Freeport	.85@ .95	Fairmont mine-run	.85@ .90
		Fairmont slack	.60@ .70

BALTIMORE

Bituminous market steady with indications for a good fall and winter trade.

From all bituminous sources came encouraging reports. Production is now only about keeping up with demand, and surplus stocks have generally been eliminated. Everybody is now looking for a good fall and winter term. Prices have held firm during the week with little or no change from the previous week.

There was a meeting here of about 18 of the Fairmont district operators this week to discuss the proposed increase of rates from West Virginia, Ohio and Kentucky to the Northwest. The operators are preparing to fight the plan before the Interstate Commerce Commission.

Vessels are scarce for use in the export trade. A number of shippers are complaining that many cargoes are being delayed on this account.

HAMPTON ROADS

Shipments foreign continue heavy. Government takings fair. Prices Unchanged.

The movement from Hampton Roads ports for the week has shown up well. The export shipments have been principally to various Italian ports although some fair-sized cargoes have gone to South America. Practically all of the coal going foreign has been New River and Pocahontas mine-run, while that shipped coastwise has consisted of mine-run, nut and slack and high volatile although the movement of the latter has not been very heavy. Coastwise shipments have been to Boston, Providence, Fall River, Portland, Pawtuckett, Bangor, Everett and other New England ports with one cargo of 7500 tons for San Francisco.

There is no change in circular prices. There is some accumulation of coal in the local yards quite a number of the large shippers are short and have some difficulty getting coal forward fast enough to take care of vessel tonnage already contracted for. The number of steamers calling for bunker coal is still below the normal but the movement is holding up well as practically all of the steamers loading coal and grain cargoes are taking sufficient bunkers for the round trip. The quantities vary according to the size of the steamers, some vessels taking as low as 300 tons and under while others take 2000 tons and over.

Railroad Tonnages—Dumpings over the local piers for the past several weeks compare as follows:

	Week Ending				
Railroad	Aug. 14	Aug. 21	Aug. 28	Sept. 4	Sept. 11
Norfolk & Western	171,252	172,546	211,699	232,394	156,459
Chesapeake & Ohio	83,390	129,826	103,472	82,485	14,680
Virginian	63,066	77,136	82,131	72,302	70,855
Totals	317,708	379,508	397,302	387,182	241,994

Ocean Charters, Clearances and Freights

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	To	Tons	Rate
Jacksonville	Bermuda	547	
I. Tunnell	Cay Francis	1,118	3.00
E. B. Douglass	Charleston	910	1.10
D. W. B.	St. John	96	1.60
S.H.Davidson	Bath	482	1.00
Maud	St. John	1,351	
Thorsa	Sagua	683	

BALTIMORE

Vessel	To	Tons	Rate
Trento	Leghorn	2,089	
St. John	Gothenburg	1,519	
Bellatrix	Port Limon	1,629	
Rauma	Callao	1,951	

BALTIMORE—Continued

Vessel	To	Tons	Rate
Sonora	Cienfuegos	1,186	
Claveresk	Felton	2,441	
Ubbergen	Tela[1]		
Gustav Adolf	Malmo	1,847	
Shawmut	Mayport	1,100	
Musner	Palermo	2,082	

[1] And Trixillio.

VIRGINIA

Vessel	To	Tons	Rate
G. Accame	Italy	1,980	10.08
Tancred	St. Lucia	2,231	
Frontenac	Rio Janeiro	1,457	7.50
P. Birdsall	Savannah	985	1.15
Dorothy	Pernambuco	758	6.50

VESSEL CLEARANCES

The following steamers have cleared from various ports Sept. 3 to Sept. 10:

NORFOLK

Vessel	Destination	Tons
Accame[1]	Torre Annunziata	5,850
Kanaris	Leghorn	5,532
Chariton[2]	Piraeus	4,704
Copenhagen	Taltal	6,482
Corbridge[2]	Buenos Aires Rds	5,500
Cheniston[1]	Genoa	6,400
Mt. Vernon[3]	Sagua	984
Queenswood[3]	Rio Grande do Su	3,246
Hermion[3]	Rio de Janeiro	7,287
Brendon[1]	Dakar	6,700
Marte[4]	Maddalena	5,026
Tabor[5]	Canal Zone	5,000
Wellington[6]	Guaymas	8,320
Sliedrecht[2]	Bahia	4,116
Parana[1]	Rio de Janeiro	5,135
Doonholm[4]	Spezia	7,018
Torrington[1]	Leghorn	7,700
Radcliffe	Genoa	8,792
Letizia[4]	Naples	2,175
Accame	Genoa	3,722
Pierce[3]	Rio de Janeiro	5,518

NEWPORT NEWS

Vessel	Destination	Tons
Ganitoise[4]	Buenos Aires	4,520
Antonio[7]	Santiago de Cuba	1,500
Parodi[8]	Spezia	5,600
Tancred[7]	St. Lucia	5,500
Chulmleigh[9]		5,800

NEWPORT NEWS—Continued

Vessel	Destination	Tons
Maritime[10]	San Francisco	7,500
Homer City[7]	W. C. Italy	5,400
Miguel Jover[7]	Maddalena	3,500
Mayaro[7]		1,400

BALTIMORE

Vessel	Destination	Tons
Trenti	Italy	4,917
Senora	Cuba	2,115
Enricken	Brazil	2,659
Luisa	Spain	4,673
Bellatriz	Costa Rica	3,469
Luygino Acme	Italy	3,951
Velgier	France	7,319
Warren	Argentina	4,300
Rauma	Peru	4,000
Erinier	France	6,046
Scherie	Italy	3,100
Joannis Vatis	Italy	5,800
Angelo	Italy	4,700
St. John	Sweden	4,500
Claveresk	Cuba	6,100
Byrd Hopkins	Venezuela	337
Anakonda	Argentina	1,500
Gustaf Adolpf	Sweden	4,700

[1] Pocahontas Fuel Co. [2] Castner, Curran & Bullitt. [3] Smokeless Fuel Co. [4] C. & O. Coal Agcy. Co. [5] Wm. C. Atwater Co. [6] Flat Top F. Co. [7] Berwind White C.M. Co. [8] New River Coal Co. [9] W. Va. Coal Co. [10] Md. C. & C. Co.

OCEAN FREIGHTS

The freight market is considerably firmer than a week ago owing to the absorption of vessels and continued demand from the grain trade. Cotton orders are also appearing in the market, and a few characters have been effected for cotton at high rates. But few steamers were closed for export coal during the past week and none of these characters were reported.

We would quote freight rates on coal by steamer as follows:

To	Rate	To	Rate
Havana	$2 50@2 75	Bermuda	**$3 00**
Cardenas or Sagua	2.75@3.00	Vera Cruz	3 50@3.75
Cienfuegos	3.00@3 50	Tampico	3 50@3 75
Port au Spain, Trinidad	**3.00**	Rio	8.04@8.16
St. Lucia	3.50@3.75	Santos*	8.16@8.40
St. Thomas	3.00@3.25	Montevideo	**8.04**
Barbados	**3.75**	Buenos Aires or La Plata†	**8.16**
Kingston	2 75@3 25	Rosario	**8.40**
Curacao	3.25	West Coast of Italy	**10.20**
Santiago	2 75@3.25	Barcelona**	**9.60**
Guantanamo	2 75@3.25	Valparaiso or Callao	7.00@7.50
Demerara	**5.00**	Marseilles	9.60@9.84

Note—Rates noted in **bold face** type are only approximate.

* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British steamers; neutral steamers are more difficult to obtain and the rates are always higher.

W. W. Battie & Co.'s Coal Trade Freight Report.

LAKE MARKETS

PITTSBURGH

Steel industry consumes record tonnage of coal. Lake shipments now satisfactory. Prices show further stiffening. Operations at 60 to 70% of capacity.

The steel mills of the Pittsburgh and surrounding districts are producing and finishing more steel than ever before in their history, and their coal consumption is undoubtedly at a record rate. One branch of the finished steel trade which is a large consumer of coal in proportion to the tonnage output, the sheet branch, is far from busy at present, the sheet mills only operating at from 60 to 75% of capacity, but other finishing lines are working up correspondingly more steel. Railroad demand has increased somewhat and is now practically normal. It has been reported lately that the Pennsylvania R.R. has put into service all its idle cars, and conditions on the Baltimore & Ohio and Pittsburgh & Lake Erie are somewhat similar.

Coal demand from retail dealers has not been good the past week or ten days, and not even up to normal for the season, as the weather has been exceptionally warm.

Lake shipments are now quite satisfactory and a normal movement to the close of the season is expected, with perhaps some pressure upon the transportation facilities. The season's total, however, will be small.

Coal prices have stiffened still further, and in particular there is more disposition to ask higher prices on contracts to Apr. 1. There is reason to expect the miners to demand a very considerable advance, for the biennial period beginning Apr. 1, such a demand as would result in a considerable suspension of mining and a sharp demand for coal preceding Apr. 1.

Mine operations in the Pittsburgh district are between 60 and 70% of capacity, on an average, with occasional reports of car shortages.

Prices for free coal are firmly held at the following minimum quotations: Slack, 50@60c.; nut and slack, 90@95c.; nut, 95c.@$1; mine-run, $1@1.05; ¾-in., $1.10@1.15; 1¼-in., $1.20@1.25, per net ton at mine, Pittsburgh district. On contract to Apr. 1 the market is firm at 85@95c. for slack, $1.15@1.20 for mine-run, $1.25@1.30 for ¾-in. and $1.35@1.40 for 1¼-in.

BUFFALO

Bituminous moving a little faster. Prices fairly strong. Prospect of a good fall and winter trade. Anthracite not stirring much yet.

Bituminous—The trade is much encouraged. All sizes, including slack, are strong and the prospect is for a steady though rather slow improvement till the average movement is reached. The main difficulty is that there is sure to be an output that will keep pace with the demand, and this will hold prices down to about the present level till some emergency appears. The expected emergency is a shortage of cars. There are already reports of a scarcity and some sections of the Pennsylvania bituminous mines are already on an allotment basis. The railroads have taken the alarm and both the bituminous and the anthracite roads are stocking considerable coal.

Reports from Canada are not reassuring. Business remains dull and the factories especially are not active. There is a sort of war paralysis over the entire land that bids fair to continue till the war is ended, or there is a decided turn for the better. It was a mistake to put up the tariff on coal there, as it has only tended to cut down business. The peculiar condition of the money market there has also made collections difficult. Not a few business men who were not doing well closed up their affairs and went into the army, sometimes leaving their debts unpaid.

The prices of bituminous grow stronger week by week. Slack is doing especially well, considering the time of the year. Quotations remain on a basis of $2.65 for best Pittsburgh lump, $2.50 for three-quarter, $2.40 for mine-run and $2.05 for slack. The price of Allegheny Valley coal is about 25c. lower than Pittsburgh.

Anthracite—The fall trade has not yet set in and the slow movement by Lake shows that the reported increased activity at Upper-Lake ports cannot be heavy. The companies appear anxious to get more coal distributed before the late fall rush and they are laying down a surplus wherever they find a convenient stocking ground. The Lake shipping agents are doing what they can to fill in any gaps on the Upper-Lake docks and will continue to do so till the Lake season closes. A report from Oswego states that after a period of light shipments the port has resumed a normal movement.

The amount of anthracite shipped from Buffalo by Lake is not heavy, being for the week only 85,000 tons. It is not common to fall below 100,000 tons during the full season. The anthracite prices have now resumed the winter maximum as follows, f.o.b. cars at Buffalo: $5.60 for grate, $5.85 for egg and stove, $6.10 for chestnut and $4.30 for pea, with 25c. extra for delivering on board Lake vessels.

TORONTO, CAN.

The usual fall advance in the price of anthracite was announced on the first of the month. Business was brisk for a week or so before the rise, but has slackened considerably since, and is likely to remain quiet until cooler weather sets in. The yards are well stocked and consignments are coming in freely. Quotations for best grades are as follows: Retail, anthracite, egg, stove and nut, $7.75; grate, $7.50; pea, $6.50; bituminous, retail, steam, $5.25; screenings, $4.25 to $4.50; domestic lump, $6; cannel, $8. Wholesale, f.o.b. cars, three-quarter lump, $3.56; screenings, $3.

COLUMBUS

Warmer weather has an adverse effect on the domestic trade. Steam business is still rather active and prices well maintained. Rural dealers buying more freely.

The warmer weather of the past week has had a rather bad effect on the domestic business. Dealers who were laying in stocks have stopped their shipments for the time being and there is a slight lull. This is believed to be temporary only, as retailers' stocks are light and dealers must lay in supplies for the winter's business.

Steam business is continuing rather active and reports show that manufacturing is still increasing. Large war orders have been placed and coal is needed for power purposes. Railroads are still stocking up large quantities to guard against strikes or other untoward circumstances. Contracting is more active and quite a few contracts are expiring at this time. There is scarcely any demurrage coal on the local market.

Prices throughout the list are holding firmly, especially on the domestic sizes. Anthracite is also moving well. Considerable Hocking lump is being stocked for the winter. Retail business is a little slow because of the warmer weather, but contracting for school supplies is going on rapidly. Rural dealers are now buying better as farmers have completed their harvesting and have time to haul their fuel supply.

The Lake trade is rather active as shippers want to rush as large a tonnage as possible to the head of the Lakes before the close of navigation. Lake prices are unchanged. Reports from the Northwest indicate that the interior movement is larger. The Toledo docks of the Hocking Valley Ry. have been busy during the week loading Lake steamers.

Prices in Ohio fields are as follows:

	Hocking	Pomeroy	Eastern Ohio	Kanawha
Re-screened lump	$1.50	$1.50		
Inch and a quarter	1.40	1.40	$1.30	$1.30
Three-quarter inch	1.25	1.25		1.25
Nut	1.15	1.25		1.15
Mine-run	1.05	1.10	1.00	1.05
Nut, pea and slack	.65	.70	.55	.65
Coarse slack	.55	.60	.45	.55

Mines have been working at about the following percentages of full capacity:

District	Week Ended Aug. 21	Aug. 28	Sept. 4	Sept. 11
Hocking	30	35	45	40
Jackson	20	20	20	25
Pomeroy	40	45	50	50
Crooksville	30	30	35	35

District	Week Ended Aug. 21	Aug. 28	Sept 4	Sept. 11
Cambridge	35	35	40	44
Massillon	30	50	40	40
Eastern O.	55	55	60	60
Average	33	34	41	42

CLEVELAND

Prices on fine coal are stiffening. Car shortage being felt. Lake coal prices firmer and higher.

Excepting Fairmount lump and mine-run the local market is supplied with all other coals quoted. There is not a great deal of coal on track and slack is from 5 to 10c. a ton higher than a week ago. How much of this is due to the idleness of the mines early last week cannot be determined until the shipments are back to normal. All of the Ohio and Pennsylvania mines lost from one day to a day and a half through car shortage last week and will lose as much this week.

There is a stronger tone to the Lake coal market. Youghiogheny coal, which has been sold at $1.95 with $2 high at the docks, is now held by many shippers at $2 to $2.05. Shippers in Ohio are also holding their coal at higher prices in about the same proportion. August weather prevailed the first of the week and the high temperature held up the domestic trade. Deliveries are being made on orders placed some days ago, but the trade continues to act slowly in laying in the winter supply.

The Lake business is showing material improvement and cargoes are coming forward somewhat better. The grain that has been threshed is slow in arriving at the upper ports and receipts have been practically half as lareg as a year ago. This has tended to hold back the coal shipments from upper Lake docks. Large receipts of grain are expected next week at Duluth-Superior and coal shipments will incerase rapidly thenceforth.

Quotations to jobbers are as follows:

	Pocahontas	Youghiogheny	Fairmount	Bergholz	Ohio No. 8
Lump	$3.70			$2.30	
Lump, 6-in.				2.30	
Lump, 1¼-in.		$2.25		2.10	$2.15
Lump, ¾-in.		2.15@2.20	$2.00	2.00	1.95@2.00
Egg	3.70			1.95	
Mine run	2.70	2.10@2.15	1.90	1.85	1.85
Slack		1.65	1.65	1.55	1.60

DETROIT

Broader market develops for steam coal. Prices continue to firm up. Domestic coal more active in retail trade. Anthracite distribution well under way. Lake transportation still curtailed.

Bituminous—Increasing optimism is noted among Detroit coal shippers, with a continuance of the favorable conditions affecting the steam-coal market, and numerous orders are being booked. Although almost all these orders cover small consignments, the repetition of these suggests a more satisfactory condition. Another encouraging feature is a greater activity of manufacturing establishments and a broader demand for steam coal. There has also been a reduction in the amount of consignment coal here. There is still much of this stock available, but the better condition of the market pervents any large tonnages from being offered at sacrifice prices.

West Virginia gas and splint three-quarter lump hold well at $1.10, while nut, pea and slack range from 55 to 65c. for lower grades to 75 and 90c. for more desirable qualities. Smokeless lump and egg are quoted at $2.25, nut at $1.75 and mine-run at $1.25, all quite firm. Hocking domestic lump is now bringing $1.35, three-quarter lump $1.25 and upward, with mine-run at 70 to 80c. These are all mine prices, lower figures being still occasionally available on sale to avoid demurrage.

Anthracite—Orders to shippers are not in large volume, the present season, following the termination of discounts, developing only limited business until stocks of retail yards have been reduced. The distribution to consumers is in progress and with the prospect of the customary winter advance of 50c. a ton the first of next month, buyers are beginning to awaken to the necessity of action. A slightly better movement from the Upper Lake docks is reflected in a freer movement of coal over the Lake route. Shipments are still far short of normal volume at this season, and even many freighters having season contracts are forced to make the upbound trip without cargoes.

CINCINNATI

Price concessions and a slow demand are keeping the domestic market dull. Some improvement in the steam trade.

Reports agree that most of the retail trade is either well stocked with bargain coal or is now receiving deliveries of fuel purchased at low prices during the spring and summer. Price concessions are still noted but have had the opposite effect from that of stimulating business. Buyers are now firmly convinced that they can get their supplies at abnormally low prices at any time.

The steam market is also very dull, but the coke market is active. Wholesale handlers of coal are far from optimistic just now, however, the general feeling being that only cold weather can help much.

LOUISVILLE

Market holds the recent improvement and consumers are beginning to cover their requirements. Car shortage already felt.

The market continues to hold firm and the optimistic feeling is still in evidence. Inquiries are numerous and the mines are selling enough coal for immediate delivery to bring about a car shortage, which was distinctly felt on the Louisville & Nashville lines for several days. One of the best indications of the improvement is the disposition of large steam coal users to contract. They have been taking advantage of the low prices, but now they are getting under cover, realizing that the market is definitely stronger and that prices are on the up-grade. Quotations are practically unchanged on eastern Kentucky coal, block bringing $1.50 to $1.75, with fancy grades at from $1.90 to $2. Slack is worth 60c. for immediate delivery, but contract business is being booked regularly around 70c.

COKE

CONNELLSVILLE

Reports of furnace coke contracts for first half 1916. Sliding scale contracts preferred. Prompt furnace coke still weak while foundry coke is stronger. Production and shipments slightly decreased.

Unconfirmed reports are that two or three furnace-coke contracts have been made, for deliveries over the first half of 1916, on the basis of $1.75 for coke when basic pig iron is $13.75, valley, or less, with 5c. advance in coke for every 25c. advance in pig iron, prices to be adjusted monthly. While it is not positively known that such contracts have been closed it is known that some operators would be willing to sell on this basis. There are rumors that one or two furnace interests have closed on an even higher basis, for the reason that the furnaces are not in blast and it is not known certainly that they will take full deliveries.

There is considerable negotiation for furnace coke for the first half of the new year, and both buyers and sellers seem to prefer a sliding-scale basis, but the negotiations are protracted as there is much discussion of ratios. Some of the furnaces seem willing to concede a great deal to the sellers, in the event of high pig-iron prices, provided they are given corresponding concessions when pig iron is relatively low.

Furnace coke for prompt shipment continues in light demand, and while there is not much unsold coke on track there seems to be enough to prevent the spot market from reflecting the prices the operators demand for forward shipment.

Demand for foundry coke continues fair, with prices slightly higher. We quote: Prompt furnace, $1.60@1.65; furnace, September, $1.75; furnace, to Jan. 1, $2; prompt foundry, $2.30@2.60; contract foundry, $2.40@2.60, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Sept. 4 at 379,935 tons, a decrease of 2,671 tons, and shipments at 380,631 tons, a decrease of 7,476 tons.

Buffalo—There are shippers who claim to be getting better prices for foundry coke than the regular quotations, but as a rule the trade finds $4.30 for best 72-hr. Connellsville foundry quite high enough, with stock coke $3.35. The former strength and activity continue and the movement of both ore and pig iron in this market appears to warrant prices on this basis. Lake receipts of ore at Buffalo for the week were 217,000 gross tons, a much larger amount than formerly.

MIDDLE WESTERN

DULUTH

Cooler weather would have a tendency to stimulate the market. Slow grain movement delaying the coal trade.

Bituminous—Dock companies have been doing only a fair volume of business during the past week, nor is any great increase in shipments looked for until cooler weather prevails. Another factor tending to retard shipments is that the grain-handling season is about two weeks later than usual, so that the customary "fall rush" of orders from the grain elevator lines engaged in the retailing of coal are not expected to appear until the middle or latter part of September.

Some wavering in prices for domestic grades to the country dealers has been noted, but on the whole the circular list has been fairly well maintained. Circular price lists issued by the dock companies, effective Sept. 1, are as follows:

	Youghiogheny	Hocking	Splint	Smokeless
Lump	$3.40	$3.40	$3.40	$4.75
Dock run	3.10	3.05	3.10	3.25
Screenings	2.40	2.25	2.40	2.75

Anthracite—There was the usual monthly advance of 10c. per ton on Sept. 1, this being the last advance of this kind for the year. The movement of anthracite to the country is about normal, although a little cooler weather would be some incentive for the dealers to stock up. Egg and stove sizes are quoted at $6.85, nut $7.10 and pea $5.55, f.o.b. cars at the docks.

ST. LOUIS

Situation good with prices steady but orders less plentiful. Screening inclined to be heavy. High-grade coals moving freely.

Trade conditions are good. Prices are keeping up on domestic sizes and screenings are in fair demand but slightly weaker. The buying, however, has not been as brisk on account of a few days of warm weather, which is also felt by the dealers, who report they have plenty of orders but they are not coming in as fast now as a few days ago.

The car situation is some better and orders for Williamson and Franklin County coal are now being filled that were taken in the latter part of August.

The demand for high-grade soft coal is sharp, showing much improvement over the past few weeks. The supply is normal and the dealers are making excellent deliveries. With the increased demand has come an advance in price and the market is considered firm at the new figures. While the higher grades are showing improvement, it is noted that the "inner group" is suffering from a lack of demand. These mines produce the greater part of the low-grade coal used in this city and the lack of work among the wage earners has prevented them from paying for their last year's coal. As a result a great amount of the cheap coal business will be done this winter in small lots, for cash and as needed. The present circumstances of the wage earners, however, are much improved and the coal dealers are not looking for a distress season.

The market is quotable as follows:

	Staunton	Collinsville	Sparta	Standard
6-in. lump	$1.35@1.50	$1.20@1.35	$1.15@1.25	$1.15@1.20
3 x 6 egg	1.15@1.30	1.10@1.25	1.00@1.10	.90@1.00
2-in. lump		1.15@1.20	1.05@1.10	.95@1.00
No. 1 nut	....	....	....	.75@ .85
No. 2 nut	....	....	....	.60@ .70
No. 1 washed	1.50	1.30@1.35	......	....
No. 2 washed	1.25@1.35	1.25	....	....
No. 3 washed	1.20	1.15	....	....
No. 4 washed	1.15	1.10	....	....
No. 5 washed	.70	.65@ .70	....	....
Screenings	....	....	.50	.45@ .50

The rate from inner group mines is 57½c. per ton to St. Louis and 25½c. per ton less to East St. Louis. For beyond St. Louis the rate to East St. Louis is 25c. per ton.

KANSAS CITY

The retail trade in Kansas City has been increasing and prices are from 25 to 75c. over those of a few months ago. The dealers have commenced to open their yards for the winter trade and much coal has arrived from the mines. The wholesale market has been a little better than for some time. Prices on semianthracite are still 25c. in advance of a month ago.

PORTLAND, ORE.

No Pennsylvania anthracite will be shipped here the coming season, it is said, because of the prohibitive water transportation rates and scarcity of vessels. Last winter it was hoped that coal could be laid down here from Pennsylvania at a figure that would permit its sale at $12 per ton, but this is quite out of the question now. Some anthracite is being brought in from Alberta, and it is said to meet with fair satisfaction. The coal sells here for $12.25 per ton, chestnut size, and $13.75 egg size.

It is said some Wellington coal may be brought here the coming fall from Vancouver Island mines, and the freight would permit it selling possibly at 50c. less per ton than the Utah coal.

PRODUCTION AND TRANSPORTATION STATISTICS

ANTHRACITE SHIPMENTS

Anthracite shipments for August and the first eight months of 1914-15 were as follows:

	August		8 Months	
	1915	1914	1915	1914
Phila. & Reading	847,262	904,643	7,100,087	7,768,256
Lehigh Valley	1,029,721	1,079,172	8,354,180	8,260,472
Cent. R.R. of N.J	613,721	637,467	5,010,562	5,735,445
Del. Lack. & West	859,368	819,848	5,970,751	6,245,125
Del. & Hudson	731,137	619,062	5,232,732	4,706,619
Pennsylvania	426,818	497,579	3,766,322	4,121,427
Erie	690,817	734,350	5,097,909	5,441,578
Ont. & Western	131,987	191,622	1,327,797	1,542,467
	5,330,831	5,483,743	41,860,340	43,321,389

Stocks at Tidewater Aug. 31 were 653,496 tons.

THE CAR SUPPLY

The American Railway Association reports a surplus of 40,919 coal and gondola cars, and a shortage of 2,332 cars on Sept. 1. The gross shortage of all cars was 6,260, which compares with 948 on Aug. 1 and 1,913 on Sept. 1 of last year.

LAKE SHIPMENTS

The movement of coal through the Sault Ste. Marie Canal for August of the current year amounted to 2,050,960 short tons, of which 279,948 tons were anthracite, and 1,771,012 tons bituminous.

BITUMINOUS COAL MOVEMENT

The following is a summary of the movement of coal and coke over 13 principal railroads during June and the first six months of the last two years, in short tons:

	June		6 Months	
Anthracite	1914	1915	1914	1915
Baltimore & Ohio[1]	78,019	79,766	711,784	606,594
Chesapeake & Ohio[1]	1,669	1,358	7,893	6,348
Erie[2]	826,756	776,260	4,468,839	4,196,731
Pennsylvania[1] [3]	855,247	843,053	5,654,277	5,423,467
Virginian[2] [1]	84		136	342
Total 5 roads	1,761,775	1,700,437	10,842,929	10,233,482
Bituminous				
Baltimore & Ohio[1]	2,517,909	3,051,305	16,234,637	14,781,587
Buffalo, Roch. & P.[1] [2]	552,867	622,873	3,862,002	3,635,333
Buffalo & Susq.[1] [2]	70,537	72,647	561,309	510,476
Chesapeake & Ohio[1]	1,822,962	2,024,639	9,672,008	10,118,056
Erie[3]	7,443	5,340	40,126	50,668
Hunt. & Br'd T. Mt.[1] [2]	62,416	66,151	528,635	459,927
New York Central[3]	604,937	683,677	3,923,543	4,184,311
Norfolk & Western[1] [2]	2,315,956	2,713,277	12,516,321	12,761,153
Pennsylvania[1] [3]	3,897,544	3,664,703	23,555,182	20,261,777
Pitts. & Lake Erie[1] [2]	975,158	998,200	5,457,907	4,337,453
Pitts. Shaw. & North[1] [2]	181,711	162,406	1,198,520	1,062,139
Virginian[1] [2]	321,181	301,932	2,027,720	1,898,671
Western Maryland	225,057	260,653	1,526,849	1,604,677
Total 13 roads	13,555,678	14,627,803	81,104,759	75,666,228
Coke				
Baltimore & Ohio[1]	298,237	329,130	1,839,861	1,627,001
Buffalo, Roch. & P[1] [2]	24,207	34,264	142,604	201,067
Buffalo & Susq.[1] [2]	35,294	49,515	164,803	293,728
Chesapeake & Ohio[1]	29,392	22,701	207,755	110,044
Norfolk & Western[1] [2]	87,921	77,528	580,668	444,294
Pennsylvania[1] [3]	793,463	990,476	5,227,885	4,998,919
Pitts. & Lake Erie[1] [2]	394,508	446,126	2,693,577	2,237,156
Western Maryland	4,001	4,097	38,505	21,586
Total 8 roads	1,667,023	1,953,837	10,895,658	9,933,795

Total Coal and Coke 13 Roads	1914	1915
January	18,157,998	15,685,798
February	15,446,830	13,702,789
March	20,233,213	14,943,124
April	15,497,444	16,070,049
May	16,523,385	17,149,668
June	16,984,476	18,282,077
Total, 6 months	102,843,346	95,833,505

[1] Includes coal received from connecting lines.

[2] Includes company's coal.

[3] Does not include company's coal hauled free.

Note:—The Southern Railway hauled 234,712 short tons of bituminous coal during May, 1915, and 1,328,516 short tons during the five months ending May 31.

I. C. C. DECISIONS

I. C. C. No. 7983—In the matter of rates, divisions, rules, regulations and practices governing the transportation of railroad fuel and other coal.

1. The character of a shipment and not formal incidents, such as billing, determines the rate and divisions applicable. The rates and divisions to points of actual destination must be applied to railway fuel coal shipments here involved, and the application of rates and divisions to fictitious billed destinations is unlawful and can not be justified by the theory that such rates and divisions would be proper rates and divisions to the average point of actual destination.

2. A railroad company as shipper is entitled to the same consideration as any commercial shipper and no more, even when the shipment moves in part over the rails of such railroad company. It follows that in such case the carrier is entitled to a division of the joint through rate. But the division must be fixed by the same considerations which would determine divisions upon a through commercial shipment in which the railroad had no interest other than that of carrier. The divisions now received out of the joint rate on supply coal by the Seaboard Air Line, the Atlantic Coast Line, and the Charleston & Western Carolina Railway Co. for the hauls from their junctions are special and abnormal divisions.

3. The Commission may fix divisions when a railroad company is the shipper or is owned by the shipper so that the division of a through rate might be the means of indirectly reducing transportation charges or effecting discriminations. Divisions here involved will not be fixed by order at this time, but carriers will be expected to adjust them to meet views herein expressed.

4. The Commission may order that such divisions be filed with it and it is so ordered as to the divisions applicable to fuel coal shipments herein involved.

I. C. C. No. 4806—Plymouth Coal Co. vs. Lehigh Valley R.R. Co.

Reparation awarded on account of unreasonable rates charged for the transportation of anthracite coal from Luzerne, Penn., to Perth Amboy, N. J., for trans-shipment.

Financial Department

Pittsburgh Coal Co.

This company reports, in part, for the year ended Dec. 31, 1914, as follows:

Earnings—The gross earnings from all sources were $4,201,070 (a decrease of $2,220,632, or 34.58%); and the net surplus earnings, after all charges and usual depreciation, were $1,371,058 (a decrease of $1,355,210, or 49.71%), being in excess of 5% on the preferred stock outstanding.

Tonnage—The total tonnage produced and handled, including coke (but exclusive of coal purchased and handled direct by subsidiary companies) was 18,295,851 net tons (a decrease of 6,411,353 net tons, or 25.95%).

Productive capacity used was about 54%. The number and use of mining plants in all fields were: working all or part of year, 71; abandoned, 7; available but idle, 6; leased, 7; total, 91. Unsettled mining conditions and substitution of West Virginia coal were the main causes of practically five months' idleness in the Ohio mines.

There was an average increase in cost of 0.49c. and a decrease in sales value of 2.51c. per ton. The Monongahela River Consol. Coal & Coke Co. had no opportunity the greater portion of the year to move its product to take care of its down-river trade. The iron and steel industry, which takes a material portion of its output, was much depressed most of the year.

Trade Conditions—Trade conditions were adverse all the year and became unprecedented during the last half-year because of foreign hostilities. Owing to excessive competition, upsetting both costs and sales values, it was difficult to secure favorable results. A large tonnage loss was made in Lake cargo and fuel business, to the advantage of the West Virginia fields, which show an increase for the year. Our representatives were sent to South America, but found no shipping facilities to compete with the present sources of supply.

Acquisition—The property and mines formerly owned by the Illinois Collieries Co. were acquired under mortgage foreclosure and are now operated under the name of the Montour Coal Co. of Illinois.

Montour R.R.—This railroad has been completed and is now in operation, its substantial construction insuring a minimum of maintenance expense. The cost of construction was increased above the amount estimated only by the practical elimination of all grade crossings, and for right of way. The three new mines which, under existing contracts, we were obligated to open during the year, are now in service and ready to develop trade.

Railroad Lake Freight Rate.—The effort of the carriers to increase coal rates and especially the Lake cargo rate from the Pittsburgh District, was not successful, and they remain the same as before the tariffs of October, 1913 were filed, without elimination of any of the existing discrimination.

Sale of Property to M. R. C. C. & C. Co.—Since Dec. 31, 1914, a sale of 10,859 acres of coal rights, including 375 acres of surface owned and improvements thereon, has been made to The Monongahela River Consol. Coal & Coke Co. (the stock of which is practically owned by this company) at an average of $812 per acre for the coal and aggregating $8,822,717.

The funds for this payment were chiefly derived from the sale of property made by that company in 1911 and interest increment since that time, which has been held by The Union Trust Co. of Pittsburgh, as trustee under that company's mortgage of 1899, applicable under its terms for the purchase of additional property or for the retirement of bonds issued under it, $6,323,000 now outstanding. This transfer will increase the coal acreage of the Monongahela Co. to approximately 26,000 acres, upon which the bonded debt, taking into account the bond sinking fund credit, will be less than $230 per acre.

Retirement of Bonds—With the proceeds of this sale it is proposed to retire the $8,011,000 bonds of the Pittsburgh Coal Co. of Pennsylvania by call for payment on July 1, 1915.

After payment of these bonds our total funded debt, including the obligations of all the subsidiary companies, will be $141.62 per acre, based on a total ownership of 148,283 acres of unmined Pittsburgh vein coal, exclusive of improvements, with all other assets free.

Benefit of This Bond Payment—This transaction will effect an annual saving of about $400,000 in bond interest, and also stop the drain on working capital of about $700,000 annually for bond principal retirement. Also through the release of the stock of the Pittsburgh Coal Co. of Pennsylvania, now pledged under the mortgage, an earlier adjustment of the dividend arrearage upon the Pittsburgh Coal Co. of N. J. preferred stock outstanding will be made possible. Furthermore, by giving up the charter of the latter company, there will be a further material saving.

Outlook for 1915—Until the depressing influences are lessened through settlement of foreign troubles and domestic affairs, no great or sustained improvement is to be expected in the trade conditions in this district, but the expected release from large interest and other overhead charges gives a reasonable assurance that our company will be able to maintain itself with results to its shareholders.

Note—For previous annual report of this company see Vol. 6, p. 92.

⁂

Elk Horn Fuel Co.

This company reports for the year ended Dec. 31, 1914 as follows:

INCOME ACCOUNT FOR YEAR ENDING DEC. 31, 1914

Earnings (all sources)	$434,320	Net income to surplus	$221,087
Expenses	14,733	Surplus Dec. 31, 1913	1,179,780
Interest on 1st M. notes	198,500		
		Total	$1,400,867
		Preferred dividends	340,720
Net income to surplus	$221,087	Surplus Dec. 31, 1914	$1,060,147

COMBINED GENERAL BALANCE SHEET DECEMBER 31

	1914	1913		1914	1913
Assets	$	$	*Liabilities*	$	$
Real est. & coal lands	25,197,462	23,482,104	Common stock	19,000,000	19,000,000
Plant and equipment, a	800,000	....	Preferred stock	7,000,000	7,000,000
*Stocks of other companies	7,298,390	7,298,390	1st M. notes	3,970,000	3,970,000
Notes E. H. M. cor.	2,475,000	....	Note issue	2,475,000	....
Adv. to sub. cos.	39,007	35,312	Min. F. Co. stock	1,200,000	....
Def. debit items	....	20,083	Min. F. 1st M. bds	1,200,000	....
Cash	244,550	81,814	Unpaid vouchers	47,193	80,896
Demand loans	....	335,081	Pay-rolls	....	12,294
Accr. divs. other cos. paid Jan. 31, 1915	43,715	....	Accr. int. on notes	37,042	33,083
Treasury stock	b315,046	....	Accounts payable	994	2,506
Supplies, etc	....	18,590	Bills payable	341,298	....
Miscellaneous	6,004	7,186	Dividend Jan. 15.	87,500	....
			Surplus	1,060,147	1,179,780
Total	36,419,174	31,278,560	Total	36,419,174	31,278,560

* Include 43,715 shares Consolidation Coal Co., 12,000 shares Mineral Fuel Co., 7,879 shares Beaver Creek Consol. Coal Co., 1,800 shares Tennis Coal Co., 500 shares York Coal & Coke Co. a Leased by Mineral Fuel Co. to Elk Horn Mining Corp. b Consists of 5,470 shares pref. and 3,624 com. stock.

DIVIDENDS

The following is a list of the more important dividends recently announced:

Consolidation Coal Co.—Regular quarterly dividend of 1½%, payable July 31 to holders of record July 24.

Delaware, Lackawanna & Western Coal.—Regular quarterly dividend of 2½% and an extra dividend of 50%, both payable July 15 to holders of record July 1.

American Coal—Dividend of 3%, payable Sept. 1 to holders of record Aug. 31.

John M. Taylor Coal Co.—Semiannual dividend of 3½% on the preferred stock, payable Aug. 20.

Elk Horn Fuel Co.—Dividend of 1¼% on the preferred, payable Aug. 2 to holders of record May 1.

Jefferson & Clearfield Coal and Iron Co.—Dividend of 1¼% on the preferred, payable Aug. 16 to holders of record Aug. 9.

Pacific Coast Co.—Regular quarterly dividend of 1¼% on the first preferred and 1% on the second preferred, both payable Aug. 2 to holders of record July 25 to Aug. 2.

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

For the official advertisements of bids wanted see the Contracts-to-Be-Let Section on Page 16.

+Indicates contracts regarding which official information has been received.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

1047—Kansas City, Mo.—William Volker & Co. still continue to buy their coal requirements on this contract (p. 116), in the open market. Address Purchasing Agent, William Volker & Co., Main and Second St., Kansas City, Mo.

1056—Kansas City, Mo.—The Gillpatrick Laundry Co. has decided to continue buying their coal requirements on this contract (p. 116), in the open market for the time being, but are willing to consider propositions to contract at any time. Address Purchasing Agent, The Gillpatrick Laundry Co., Vine and 15th St., Kansas City, Mo.

1062—Kansas City, Mo.—The Faultless Starch Co. will still continue to make their fuel purchases in the open market (p. 116), but they are willing to consider a proposition to cover their requirements at any time. Address Pres. J. G. Beecham, Faultless Starch Co., 1025 E. Eighth St., Kansas City, Mo.

+1192—New Brunswick, N. J.—Bids have been received on this contract (p. 244), which provides for furnishing the City Pumping Station with approximately 900 tons of coal as follows: Daniel June No. 1 Logan $4; New Brunswick Ice Co., Beaverdal $4.30; C. W. Russell No. 1 Logan $4.39. No notice of the award has yet been received. Address City Clerk E. J. McLaughlin, Dept. of Pub. Affairs, New Brunswick, N. J.

+1198—Columbus, Ohio—The Ohio Board of Administration advises that they are now only receiving bids on the Cleveland State Hospital, Columbus State Hospital, Dayton State Hospital, and Ohio Penitentiary on this contract (p. 244). Address T. E. Davey, Ohio Bd. of Administration, Columbus, Ohio.

+1252—Minot, N. D.—The second call for bids on this contract (pp. 284, 410) was received until 2 p.m., Sept. 17. The contract provides for furnishing school buildings Nos. 1, 2, 3 and 4 of the Burlington School District with coal. Address Clk. W. E. Gross, Burlington Schoool Dist. No. 7, Minot, N. D.

1260—Louisville, Ky.—The Watterson Hotel, which usually consumes 2500 tons of nut and slack coal per year advise that they are concluding arrangements to buy steam and will not make any contract this season. Address Mgr. Robert B. Jones, Watterson Hotel, Louisville, Ky.

1262—Des Moines, Iowa—The tonnage involved on this contract (p. 324), which provides for furnishing coal to some 60 schoolhouses of the Independent School District aggregates about 8000. Steam coal will be required mostly although some lump and range will also be bought. The contract is to include cost of delivery in the bins at the schoolhouses. Address Secy. A. L. Clinite, Bd. of Edu., Des Moines, Iowa.

1267—Wellsburg, W. Va.—This contract (p. 324), which provides for furnishing the local City Water-Works with coal during the ensuing year was bid on as follows: Wolf Estele & Ondo $5\frac{9}{10}$c. per bu.; Elias K. Lazear 6c. per bu.; Washington Pike Coal Co., 6¼c. per bu. Address Secy. J. F. Thompson, City Water Bd., Wellsburg, W. Va.

+1285—Bay City, Mo.—New bids have been received on this contract (p. 324), which provides for furnishing the County Government with coal for the Court House during the ensuing year as follows: City Fuel & Supply Co., $3.40; A. S. Williams & Co., $3. Steam lump coal is required. Address County Clk. C. L. Fox, Bay City, Mo.

New Business

+1417—Reading, Mass—The Municipal Light Department at this place usually contracts for their annual requirements of coal some time during the fall months. The current contract was filled on the basis of $4.20 per ton for Pocahontas or New River coal, the gross requirements being approximately 400 tons. Address Mgr. A. G. Sias, Municipal Light Dept., 179 Main St., Reading, Mass.

+1418—Huron, S. D.—The Board of Commissioners at this place received bids until 1 p.m., Sept. 13, for furnishing approximately 400 tons of Youghiogheny lump coal, to be delivered at the city pumping plant as required at the rate of about 40 tons per month. Bids were also received on 12 tons of anthracite and 18 tons of Pocahontas lump coal to be delivered at the City Hall, Jail and Library. Address City Audr. S. S. Oviatt, Huron, S. D.

1419—Bellaire, Ohio—The Mead Township Board of Education received bids until Sept. 10, for furnishing approximately 1,900 bu. of three-quarter coal to be delivered to the various subdistricts as required prior to Oct. 1. Address Clk. Thomas C. Kirkland, Mead Township, Bd. of Edu., Belmont County, Bellaire, Ohio.

1420—New Haven, Conn.—The Connecticut Co.'s contract, involving approximately 22,000 tons of good grade low volatile, low ash, low sulphur bituminous coal, expired on the first of the current month. Shipments are made as required f.o.b. boats, to be placed by the company at New York loading ports. For data in regard to the old contract see Vol. 6, p. 735. Address Pur. Agt. J. H. Sanford, The Connecticut Co., New Haven, Conn.

+1421—Dowagiac, Mich.—The Water and Light Dept. at this place usually contracts some time during October for their annual requirements of coal involving approximately 1,000 tons. Island Creek nut, pea and slack coal is commonly used and the usual price is about $3.10 per ton. Address Supt. W. E. Reynolds, Water and Light Dept., Dowagiac, Mich.

1422—Westwego, La.—The New Orleans Industrial Oil Co., are receiving bids on approximately 100 tons of steam coal for use during the ensuing year. Address Mgr. J. P. Eggert, New Orleans Industrial Oil Co., Westwego, La.

+1423—Topeka, Kan.—The Municipal Electric Department usually contracts in October for their annual requirements of coal involving approximately 400 tons. Southern Kansas coal is used and it is ordinarily bought at $2.25 per ton for slack and $2.50 for stove. The business is done on competitive bids. Address Supt. E. G. Stahl, Municipal Electric Light Dept., Topeka, Kan.

1424—Warren, Ohio—The Trumbull County Board of Commissioners will receive bids until Sept. 20, for furnishing about 500 tons of coal for the County Infirmary. Address Audr. W. R. Harrington, Trumbull County, Warren, Ohio.

1425—New Orleans, La.—The Albert Weiblen Marble & Granite Co. will soon contract for their annual requirement of coal involving approximately 2,000 tons. Address Pur. Agt. Albert Weiblen Marble & Granite Co., City Park Ave. and St. Louis St., New Orleans, La.

+1426—Rugby, N. D.—The Pierce County Commissioners will receive bids until 2 p.m., Oct. 5, for furnishing coal as may be required during the ensuing year. Address Audr. A. O. Spillum, Pierce County, Rugby, N. D.

1427—Zylonite, Mass.—The contract for the Berkshire St. Ry. Co., involving approximately 21,000 tons of a good grade, low volatile, low ash, low sulphur, bituminous coal expired on the first of the current month. Shipments are to be as required, and quotations should be made f.o.b. cars at mines for Tunnel Power plant at Zylonite, Mass., B. & A. R.R. Address Pur. Agt. J. H. Sanford, Berkshire Street Ry., New Haven, Conn.

+1428—Unionville, Mo.—The Municipal Light and Water Works at this place usually contract some time in October or November for their annual requirements of coal, involving about 200 tons of nut and pea per month. The business is done on a competitive basis and the approximate cost is about $1.10 per ton. Address Supt. M. T. Lynn, Unionville, Mo.

1429—Massillon, Ohio—The Board of Education of the city school district will receive bids until Sept. 29 for furnishing the various public schools with Goshen or Massillon mine-run lump and slack coal. Address Clk. William Fielberth, Bd. of Edu., Massillon, Ohio.

1430—Fargo, N. D.—Bids were received until Sept. 15 for furnishing approximately 1,500 tons of Youghiogheny screenings and 500 tons of Pocahontas mine-run, to be delivered at the Detention Hospital and Filtration Plant as required during the ensuing year. Address Audr. A. R. Watkins, Bd. of Com., Fargo, N. D.

1431—Braddock, Penn.—Bids were received until 7 p.m., Sept. 13, for furnishing the Rankin School Board with three-quarter and mine-run coal. Address Secy. H. W. Peters, Rankin School Bd., Rankin, Penn.

1432—Hammond, Ind.—The Northern Indiana Gas & Electric Co. usually contract for their annual requirements of coal some time during October. One and one-quarter inch Indiana screenings are used and approximately 35,000 tons are required. The coal is bought on competitive bids, the usual price being about $1.38 per ton delivered. Address Purchasing Agent, Northern Indiana Gas & Electric Co., Hammond, Ind.

+1433—Peoria, Ill.—The City Government received bids until 5 p.m., Sept. 14, for furnishing the city with bituminous lump coal for one year beginning Oct. 1. The coal must be from Peoria County and 1¼-in. lump size. A certified check for $200 must be furnished with each bid. Address Clk. William E. Moran, Peoria, Ill.

+1434—Poplar, Mont.—Bids will be received by the Poplar Public Schools, District No. 9, until noon, Sept. 24, for furnishing approximately 75 tons of Hocking Valley coal to be delivered in the school bins as required during the ensuing year. Address Clk. H. C. Walker, School Dist. No. 9, Poplar, Mont.

1435—New Orleans, La.—The Canal Bank & Trust Co. will receive bids until Oct. 1, for furnishing coal required at their office buildings, involving approximately 150 tons of bituminous. Address Purchasing Agent, Canal Bank & Trust Co., Camp and Gravier Sts., New Orleans, La.

1436—Linton, N. D.—The Emmons County Board of Commissioners will receive bids until 4 p.m., Oct. 5, for furnishing and delivering 70 tons of lignite coal at the County Court House. Address Audr. John R. Snyder, Linton, N. D.

+1437—Osage City, Kan.—The City Government received sealed bids until 8 p.m., Sept. 15, for furnishing the coal required by the local Electric Light Plant, and for other city purposes during the period from Sept. 15, of the current year to Mar. 15 of next year. Osage City shaft coal is required. Address City Clk. C. E. Johnson, Osage City, Kan.

1438—New Orleans, La.—The Interstate Bank & Trust Co. will be in the market about Oct. 1 for their annual fuel requirements of their office building, involving about 200 tons of bituminous coal. Address Pur. Agt. Mr. Billingsley, Interstate Bank & Trust Co., New Orleans, La.

1439—Muscatine, Iowa—The County Government received bids until 5 p.m., Sept. 14, for furnishing approximately 200 tons of soft lump coal for use on the Muscatine-Louisa Drainage District No. 13. Address Audr. H. C. Schoemaker, Muscatine County, Muscatine, Iowa.

1440—Minot, N. D.—The Lexington Hotel at this place will receive bids until 2 p.m., Sept. 18, for furnishing approximately 300 tons of screened lignite coal, quotations to be f.o.b. Minot. Address Olof O. Olson, Lexington Hotel, Minot, N. D.

1441—New Orleans, La.—The New Orleans Cold Storage & Warehouse Co. will contract about Oct. 1 for their annual requirements of coal, involving approximately 3,500 tons of bituminous. Address Purchasing Agent, New Orleans Cold Storage & Warehouse Co., Gainnie and Front St., New Orleans, La.

1442—Crookston, Minn.—The Polk County Board of Commissioners will receive bids until 2 p.m., Sept. 21, for furnishing approximately 160 tons of Greensbury mine-run coal to be delivered at the Court House as required during the coming fall and winter. Address Audr. H. J. Welte, Polk County, Crookston, Minn.

1443—Minot, N. D.—The Dakota Bakery Co. will receive bids until 2 p.m., Sept. 30, for furnishing one carload of lignite coal per month. Address Purchasing Agent, The Dakota Bakery Co., Minot, N. D.

1444—New Orleans, La.—The American Brewing Co. of this place is in the market for their annual supply of coal, involving approximately 10 tons per day. Address Ed. G. Schleider, American Brewing Co., New Orleans, La.

1445—Chariton, Iowa—The County Government received bids until noon, Sept. 14, for furnishing coal required at the Court House, County Home, and for the paupers. The coal for the Court House will be delivered in the bin. Address Audr. Fred. N. Wilson, Chariton, Iowa.

+1446—Mauch Chunk, Penn.—The Borough School Board at this place will receive bids until 4 p.m., Sept. 24, for furnishing 60 tons of chestnut coal to be delivered at the Asa Packer Building, and 75 tons of pea coal to be delivered in the First Ward Building. Address Secy. C. S. Weiler, Borough School Bd., Mauch Chunk, Penn.

1447—New Orleans, La.—The Jacob Candy Co. will contract about Oct. 1 for their winter's supply of coal, involving approximately 400 tons of Pratt lump coal. Address Pres. Mose Jacobs, Jacobs Candy Co., Carondelet St., New Orleans, La.

+1448—Crosby, Minn.—The Independent School Dist. No. 51 will receive bids until 8 p.m., Sept. 18, for furnishing and delivering Youghiogheny screened lump coal, as may be required during the school year at Ironton, Thomas Jefferson and Franklin schools. Address Clk. J. E. McCoy, Independent School Dist. No. 51, Franklin School Bldg., Crosby, Minn.

+1449—Lisbon, N. D.—The Lisbon Special School Dist. No. 19 will receive bids until 1 p.m., Oct. 1, for furnishing approximately 125 tons of Hocking Valley, Zenith, Sunday Creek, Youghiogheny or Scott Smokeless Briquetts, to be delivered in the bins of the school buildings. Address Clk. W. S. Adams, Lisbon Special School Dist. No. 19, Lisbon, N. D.

+1450—Detroit, Mich.—The Wayne County's Board of Auditors will receive bids until 11 a.m., Sept. 18, for furnishing approximately 25 tons of anthracite chestnut, and 2,500 tons of bituminous three-quarter lump. Address Secy. William Gutman, Bd. of Audrs., Wayne County, Detroit, Mich.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

+No. 960—Harriman, Tenn.—This contract (pp. 41, 411), which provides for furnishing the Harriman Water and Light Department with 2,160 tons of coal, has been awarded to the **Middle Creek Co.** instead of Church & Co. as previously noted. Bids on this contract were: Goldfield Coal Co., 95c.; State Mine Coal Co., $1.15; Middle Creek Co., $1. All bids were on mine-run coal. Address R. C. Walzl, Harriman Water & Light Dept., Harriman, Tenn.

No. 970—Gretna, La.—This contract (p. 41), which provides for furnishing the American Cotton Oil Co., has been awarded to the **Warrior Coal Co.** of Birmingham, Ala., at between $1.12 and $1.18 per ton. The contract, which involves 20,000 to 25,000 tons, will be filled on Pratt mine-run coal. Address Mgr. John W. Todd, American Cotton Oil Co., Gretna, La.

No. 1018—Kansas City, Mo.—This contract (p. 77), which provides for furnishing the Kelly Milling Co. with about 20 tons of slack coal per day, has been awarded to the **Sheridan Coal Co.** at $2.05 per ton. The Cherokee Fuel Co., Central Coal & Coke Co., and Interstate Coal Co. each bid $2.05 per ton also, it being understood that the contract was awarded to the **Sheridan Coal Co.** on account of the regular grades. Address J. M. Kelley, Jr., Kelly Milling Co., Rochester and Park Ave., Kansas City, Mo.

+No. 1019—Allentown, Penn.—bids on this contract (pp. 77, 157), which provides for furnishing the North Whitehall Township school district with 100 tons of stove and chestnut coal, were all the same, $6.25 per ton, so that the contract was divided equally between the three companies, who were the Balliet Bros. & Co.; R. W. Grammer, and Rockdale Coal Co. Address Secy. A. N. Kuhns, Orefield, Penn.

+No. 1035—Pueblo, Colo.—Thic contract (p. 115), which provides for furnishing the local schools with coal during the ensuing year, has been let in part, the requirements for District No. 20, including all the territory in the city south of the river, involving approximately 400 tons, having been awarded to the **Iron City Fuel Co.** and the **Forbush Fuel & Ice Co.** at $2.10 per ton for Rugby slack, f.o.b. cars, Pueblo. About 2000 tons per annum are required in this district, but the remainder will not be contracted for, purchases to be made in the open market on the prospect of obtaining better prices. On the contract for District No. 1 covering all the cities north of the Arkansas River, and involving approximately 1,600 tons, there were four bidders but no award has yet been made. Address E. J. Scott, Pueblo, Colo.

No. 1125—Columbus, Ohio—Director of Public Service G. A. Borden has awarded this contract (pp. 158,283), as follows: Elk Coal Co., Columbus, approximately 3,500 tons of West Virginia mine-run to the Scioto River Pumping Station at $1.42 delivered on the switch, the Victoria Coal Co., Columbus, approximately 10,000 tons of Hocking nut, pea and slack for the municipal light plant at $1.19, also the 3,000 tons for the Garbage Reduction plant, Hocking nut, pea and slack at $1.19; M. A. Suydam & Co., Columbus, was awarded the contract for about 500 tons for various other city departments, delivered, Hocking lump at $2.17½. There was considerable controversy over these contracts and Director Borden has asked an opinion of the city solicitor if he could award the contract for Ohio-mined coal even at higher figures. The answer was that he was the judge as to the "lowest and best bids." Address Dir. of Pub. Safety B. L. Bargar, City Hall, Columbus, Ohio.

1132—Bloomington, Ill.—This contract (p. 198), which provides for furnishing the local Bd. of Education with approximately 1000 tons bituminous lump coal, has been awarded to the **McLean Coal Co.**, on 2nd or 3rd Vein at $2.75 per ton. Address, Chairman R. E. Williams, Board of Education, 602 Peoples Bank Bldg., Bloomington, Ill.

+1146—Wichita, Kan.—This contract (p. 199), which provides for furnishing the local Board of Education with approximately 2500 tons of coal, has been awarded. The bidders on the contract were: The Central Coal & Coke Co., the Jackson-Walker Co., and the Good-Hillyard Coal & Feed Co. Address Clk. J. L. Leland, Bd. of Edu., City Hall, Wichita, Kan.

+No. 1149—Broken Bow, Neb.—This contract (p. 199), which provides for furnishing Custer County with its coal requirements during the ensuing year, has been awarded to the **Dierks Lumber & Coal Co.**, at $6 per ton delivered in bin at the county courthouse. Address Clk. R. E. Waters, Broken Bow, Nev.

+No. 1150—Muscatine, Iowa—This contract (p. 199), which provides for furnishing the county institutions with 400 tons of bituminous coal, has been awarded to the **Huttig Lumber & Coal Co.** Address County Audr. H. C. Shoemaker, Muscatine, Iowa.

+No. 1153—New Philadelphia, Ohio—This contract (p. 199), which provides for furnishing the Local Board of Education with coal as required during the ensuing year, has been awarded to **John Hale** at $2 per ton delivered in the school buildings. The coal is to be clean and loaded on wagons with a fork at the mine. Other bids received on this contract were: Earnest Carson, 9c. per bu. (80 lb.); Whippoorwill Coal Co., $2.20 per ton and $2.15 per ton where delivery can be made by motor truck; John Marchesi, $2.25 per ton; Brown Coal Co., $2.20 per ton; New Castle Coal Co., $2.25 per ton. Address Clk. A. A. Stermer, Bd. of Edu., New Philadelphia, Ohio.

1163—Carthage, Mo.—This contract (p. 199), which provides for furnishing the local Board of Education with approximately 250 tons of Nevius coal, has been awarded to the **I. C. Wheeler Building & Milling Co.** at $3.15 per ton delivered in the bins. Address Chn. W. F. Maring, Supply Com., Bd. of Edu. Carthage, Mo.

+1164—Fargo, N. D.—This contract (p. 199), which provides for furnishing the local board of education with coal during the year ending June 1, 1916, has been awarded as follows: **Washburn Lignite Coal Co.**, 2000 tons of lignite at $3.15 per ton, delivered; **O. M. Strate**, 200 tons of Pocahontas mine-run at $5.35 per ton. The Dakota Lignite Coal Co. also bid on lignite coal and there were four additional bids on the Pocahontas. Address Secy. E. G. Guthrie, Bd. of Edu., High School Bldg., Fargo, N. D.

1167—Guthrie Center, Iowa—This contract (p. 199), which provides for furnishing the Guthrie County Courthouse with coal during the ensuing year, has been awarded to **Compton & Son** at 15c. per bu. delivered at the Court House. Address W. H. Neal, Bd. of Supervisors, Guthrie County, Guthrie Center, Iowa.

+1174—Canton, Ohio—This contract (pp. 243, 366), which provides for furnishing the local public schools with approximately 2800 tons of coal, has been awarded to the **Steiner Coal Co.** at $2.24 per ton for Crescent No. 8 coal from Belmont County. This company has furnished the coal for the local schools for a number of years and although its bid was not the lowest, it was again accepted this year. Address Clk. W. C. Lane, Bd. of Edu., High School Bldg., Canton, Ohio.

+No. 1176—Topeka, Kan.—This contract (pp. 243, 366), which provides for furnishing the local Board of Education with its coal supply, has been awarded to the **Southwestern Fuel Co.** on the following basis: 200 tons of lump, $3.60; 200 tons of slack, $2.65; 2000 tons of nut, $3.20. Address Clk. M. C. Holman, Bd. of Eud., Topeka, Kan.

1195—Green Bay, Wis.—This contract (p. 244), which provides for furnishing the Brown County Asylum with approximately 600 tons of pile-run bituminous coal, has been awarded to **F. Hurlbut Co.**, at $3.25 per ton for Kentucky Elkhorn coal. Bids were received for the same grade of coal from other companies as follows: H. Barkhausen Co. $3; C. Keiss Co. $3.41; Haevers Co. $3.20. Address Joseph H. Servotte, Bd. of Trustees, Brown County Asylum, Green Bay, Wis.

No. 1199—Chattanooga, Tenn.—This contract (p. 244), which provides for furnishing the city government with approximately 1800 tons of coal for the fire halls, school buildings, and other city buildings, has been awarded to **Church & Co.** Address Comr. E. D. Herron, Dept. of Pub. Utilities, Grounds and Bldgs., Chattanooga, Tenn.

+No. 1205—Uhrichsville, Ohio—This contract (p. 244), which provides for furnishing the Board of Education with screened coal, has been awarded to **C. R. Shipton** at $2 per ton. Address Clk. D. E. Rock, Uhrichsville Village School Dist., Uhrichsville, Ohio.

1206—Sawyer, N. D.—This contract (p. 244), which provides for furnishing and delivering for the county government at this place, approximately 100 tons of lignite, has been awarded to **Jay Sharar**, at $2.89 per ton. Henry Greenwald bid $3 per ton and Henry Buechler $2.90, per ton. Address, Dist. Clk. E. D. Skinner, Sawyer, N. D.

+1207—Cloquet, Minn.—This contract (p. 244), which provides for furnishing the local Board of Education with approximately 500 tons of Pocahontas screened lump coal, has been awarded to **William Kelly**, at $5.23 per ton. William Lane bid $5.25 and J. E. Johnson $5.50 per ton. Address Dist. Clk. L. F. Leach, Bd. of Edu., Cloquet, Minn.

+1209—Wahpeton, N. D.—This contract (p. 245), which provides for furnishing the Richland County commissioners with approximately 300 tons of Pocahontas mine-run coal, has been divided equally between **H. M. Christenson** and **J. E. Morris**, both of whom bid $6.15 per ton delivered. J. B. Lotzer bid $6.25 per ton. Address County Audr. F. A. Burton, Wahpeton, N. D.

1210—Buffalo, Minn.—This contract (p. 245), which provides for furnishing the county government with approximately 100 tons of Youghiogheny screened lump coal, 60 tons of which are to be delivered at the Court House and the balance f.o.b. side track at this place, has been awarded to **Wm. Karb.** Address County Auditor John A. Berg, Buffalo, Minn.

+No. 1214—Dayton, Iowa—This contract (p. 245), which provides for furnishing the Independent School District with coal, has been awarded to **William & Shastrom** at $6.05 per ton for the best Kentucky coal, delivered at the school houses. Address Secy. O. S. Larson, Independent Dist. of Dayton, Iowa.

1218—Mott, N. D.—This contract (p. 245), which provides for furnishing the Mott School District with approximately 250 tons of lignite coal has been awarded to **N. A. Mosher** at $2.50 per ton. Address Clk. R. E. Trousdale, Mott School Dist. Mott, N. D.

+1222—Regent, N. D.—This contract (p. 245), which provides for furnishing the Regent School District with a good grade of lignite coal has been awarded to **N. R. St. Marie** at $2.20 per ton. Address Clk. F. L. Schnebly, Regent School Dis. No. 14, Regent, N. D.

+No. 1223—Missoula, Mont.—This contract (p. 245), which provides for furnishing the local school board with approximately 500 tons of coal, has been awarded to the **Perry Coal Co.**, at $5.55 per ton for special Round-Up lump coal delivered at the school buildings. Address Clk. M. R. Hardenburgh, School Dist. No. 1, Missoula, Mont.

1228—Johnstown, Penn.—This contract (p. 245), which provides for furnishing the Board of Education with coal during the ensuing year, has been awarded as follows: **Charles P. Bender**, First District, $1.43 per ton; **Prosser-Thomas Coal Co.**, Third District, $1.50 per ton; **Charles P. Bender**, Second District, $1.40 per ton. There were nine bidders on the contract. Address Secy. Charles H. Meyer, Bd. of Edu., 601 Swank Bldg., Johnstown, Penn.

+1231—Wilkes-Barre, Penn.—This contract (p. 245), which provides for furnishing coal for the 23 school buildings of the local school district, during the ensuing year, has been awarded to **W. G. Downs** as follows: Schools Nos. 1, 2, 3, 4 and 5, $4.20 per ton; No. 6, $3.20; No. 7, $2.40; No. 2 (buckwheat), $1.63; rice, $1.12. Address Secy. W. H. Morris, 58 Lee Park Ave., Hanover Township, Penn.

+1233—Dickinson, N. D.—This contract (p. 283), which provides for furnishing the local School Board with approximately 500 tons of mine-run coal, has been let to the **Oakota Lignite Mines Co.**, at $2.18 per ton for lignite delivered to the school buildings. Address Clk. L. R. Baird, Bd. of Edu., Dickinson, N. D.

+No. 1244—Delaware, Ohio—This contract (p. 284), which provides for furnishing the County Commissioner with 240 tons of 3-in. coal and 40 tons of washed nut, f.o.b. cars, Leonardsburg, Ohio, has been awarded to **S. C. Kissner & Sons.** Address County Audr. W. D. Aldrich, Leonardsburg, Ohio.

No. 1245—Missoula, Mont.—This contract (p. 284), which provides for furnishing between 250 and 300 tons of coal for the high school building, has been awarded to the **Perry Coal** Co., on Bear Creek lump, at $6.10 per ton. Address Secy. A. J. Violette, Bd. of Trustees, County High School, Missoula, Mont.

+1246—Fairmont, N. D.—This contract (p. 283), which provides for furnishing the local School Board with two carloads of stove coal, has been awarded to the **Sulzer Lime Co.** at $9.45 per ton delivered in bins during August and $9.50 per ton in January. Turback Bros. bid $9.70 and Elliott Elevator Co., $9.50 on track. Address Clk. F. E. Crafts, Bd. of Edu., Fairmont, N. D.

+1248—Lake Park, Minn.—This contract (p. 284), which provides for furnishing the local Board of Education with coal, has been awarded to **E. T. Viger & Son,** at $5.19 per ton for Hocking lump coal. Address Secy. Kristofer Delager, Bd. of Edu., Lake Park, Minn.

1250—Falls City, Neb.—This contract (p. 284), which provides for funrishing the local Board of Education with approximately 500 tons of coal, has been awarded to **I. C. Maust** at: Weir City nut, $4; Breese 6-in. lump, $4.25. Quotations include cost of delivery in bins, some of the buildings requiring a haul of a mile and a half. Address Secy. F. Brecht, Bd. of Edu., Falls City, Neb.

+No. 1253—Stanley, N. D.—This contract (p. 323), which provides for furnishing the Montrail County Court House with coal as may be required during the ensuing year, has been awarded to the **Nelson Grain Co.,** at $3.10 per ton for lignite coal delivered in the bin. Address County Audr. H. P. Duggan, Court House, Stanley, N. D.

Contract Notes

Albert Lea, Minn.—The contract for furnishing the County Poor House has been awarded to the **Speltz Grain & Coal Co.**

Dickinson, N. D.—The contract for furnishing the Dickinson schools with 500 tons of coal was let to the **Dakota Lignite Co.,** at $2.18 per ton. Lignite mine-run was specified.

New Orleans, La.—William Garrigue Co., Gretna, La., Swift & Co., Harvey, La., and the Westwego Ice & Bottling Works, Westwego, La., recently started using oil instead of coal.

Argenta, Ark.—The contract for furnishing 100 tons of the best domestic lump for the city schools has been awarded to **J. Y. Worthan** at $4.25 per ton delivered in the bins. Other bids ran as high as $4.40.

Crookston, Minn.—Sargent & Hanna, of Grand Forks, have been awarded the contract for furnishing the public school buildings of the city with coal for the fall and winter term, their bid being $4.54 per ton.

New Orleans, La.—The New Orleans Industrial Alcohol Co. has opened a new factory at Westwego, La., across the river from New Orleans, and will be in the market for coal very shortly. Address, New Orleans Industrial Alcohol Co., Westwego, La.

Lewiston, Idaho—The Idaho Ice & Cold Storage Co., who are mine agents for several Wyoming and Utah coals announce an advance of 25c. per ton, which is an unusual condition at this time of year. No reason for the advance has been given.

Springfield, Minn.—The contract for furnishing the local Board of Education with 125 tons of Hocking Valley screened lump coal has been awarded to **Charles Davin** at $5.50 per ton delivered in the bin. Address Clk. John Schmelz, Bd. of Edu., Springfield, Minn.

Louisville, Ky.—Strater Bros. Tobacco Co., at this place, consumes about 200 tons of Kentucky pea and slack coal per annum. Deliveries are made by wagon at the rate of approximately 6½ tons a day. Address Purchasing Agent, Strater Bros. Tobacco Co., Louisville, Ky.

Hillsboro, N. D.—The prices at which the contract for furnishing the local power house with coal during the ensuing year (p. 246) was awarded were: Youghiougheny pea, $3.10; Elkhorn screenings, $2.65. As previously noted, the contract went to the **Hillsboro Lumber Co.** Address City Audr. N. G. Nyhus, Hillsboro, N. D.

Philadelphia, Penn.—The Bernstein Mfg. Co., at this place, consumes approximately 1500 tons of bituminous coal. Deliveries are made by railroad at the rate of 125 tons per month. The company has storage capacity for 75 tons. Address, Pur. Agt. H. W. Schob, Bernstein Mfg. Co., Third and Allegheny Ave., Philadelphia, Penn.

New Orleans, La.—The contract for supplying the Tulane University and Newcomb College with coal during the ensuing year has been awarded to the **R. P. Hyams Coal Co.** The tonnages involved are 590 tons of steam coal, 175 tons anthracite, 1,000 barrels gashouse coke. Address Pur. Agt. F. D. Layman, Tulane Campus, New Orleans.

Topeka, Kan.—The State Board of Control has awarded a contract for furnishing the State Charitable Institutions with approximately 60,000 tons of coal to the **Topeka Cold Storage Ice and Fuel Co.,** at $1.74 per ton for domestic coal and $1.34 per ton for slack. It is provided that all the coal must be deep-mined. The price is slightly under the figures for last year.

New York—The Commissioner of Docks and Ferries opened bids on Sept. 7 for furnishing and delivering 15,000 gross tons of No. 1 buckwheat and 6,000 tons of semibituminous coal at such times as may be directed. Meeker & Co. and Pattison & Bowns bid $2.89 per ton on both the buckwheat and bituminous, and Charles D. Norton & Co. bid $2.68½ per ton on the same. For previous purchases of this department during the current year, see contracts Nos. 48, 373, 935, 1068, and contract note, Vol. 8, p. 286. Address Comr. R. A. C. Smith, Dept. of Docks and Ferries, Pier A, foot of Battery Place, New York City.

Railroad Storage—The various railroads are continuing to pile up coal in anticipation of possible labor disturbances. The Pennsylvania R.R. in addition to storing coal at East and South Altoona is also putting in stock a large quantity in the Enola freight yards near Harrisburg, and is arranging for the storage of anthracite at Lock Haven and Sunbury. The Lehigh Valley is filling its plant at Hudsondale, and is also arranging to fill the old Black Creek Junction plant. In addition to the large stocks of anthracite which they always carry, the Reading is storing bituminous coal in the vicinity of Pottsville and at other points along the line.

Columbus, Ohio—A strong protest has arisen among the people of the state over the award of the contract for 15,000 tons of coal for the Ohio State University for coal to be mined outside of the state (p. 286). The contract was awarded to the Lorain Coal & Dock Co., of Columbus, for Logan County (W. Va.) coal. Governor Willis, who has been taking a leading part in the "use Ohio coal" campaign, is very much worked up over the award and he is trying to get the successful bidder to agree to secure a portion of the tonnage from Ohio. The trustees of the Ohio State University claim that the B.t.u. test showed the samples of Logan County coal to be the best.

Foreign Notes

St. Michaels, Azores—Coal is selling as high as $12.90 a ton at this place.

Azores—Another order for 3,000 tons of American coal has been placed by local dealers for delivery in schooners. Several schooners have been employed in the trade in recent months. The quickest voyage was 25 days. Freights are $6 to $7.50 per ton.

Russia—An American consular officer in Russia transmits the name and address of a railroad official who desires to receive names and addresses of American producers and exporters of coal who are in a position to ship coal to Russian Black Sea ports at the conclusion of the war.

Brazil—A firm of commission agents in Brazil informs an American consular officer that it would be pleased to represent American manufacturers and exporters. One member of the firm has had considerable experience in the sale of coal and desires to make a specialty of this. Other lines are not specified. Correspondence may be in English.

Chile (July 16)—Scarcely any business has been done in coal during the past fortnight, and the few transactions effected were: Part of a sailer cargo of Seaham, May sailing, was resold at $9.12 for Antofagasta, and a small lot, same class, July sailing, at $9.73 for Iquique. A steamer cargo of Pocahontas, August sailing, was placed at $9.73. We quote Australian at $9.73 to $10.95, according to class, port and sailing.

London, England—Philadelphia export shippers of bituminous coal have been surprised to receive inquiries for shipments to Liverpool, England. It has been known for some time after Aug. 13 the British Government would prohibit the export of coal from the British Isles and it was presumed that they would then be able to take care of all demands for domestic consumption. The shortage is probably due to the fact of so many of the English and Welsh miners have enlisted, and an increased quantity is necessary for the warships and munition plants.

COAL AGE

Vol. 8 NEW YORK, SEPTEMBER 25, 1915 No. 13

Improved Outlook in Coal Mining

> *OPTIMISM prevails in the coal and coke industries. The feeling of pessimism so prevalent among mining men a few months ago has largely disappeared. This change for the better is based on an actual improvement in the nation's fuel situation and is widespread. If present prospects are realized, the coming winter will show greater prosperity to coal men than they have experienced in years.*

ANTHRACITE shipments for the first eight months of the current year are 2,000,000 tons less than last year. It will require active fall mining to overcome this deficiency. Consumers have hesitated more than usual and customary surpluses have not been accumulated.

Bituminous shippers are very conservative over future commitments. The export trade is most certain to prove a potent factor in the domestic market. European demands are increasing. Vessels bunkering are taking double tonnages for the round trip.

Steel mills in the Pittsburgh district are producing a greater tonnage than ever before in their history, and coal and coke consumption in this line is at a record rate. Coal prices have stiffened generally, and further important advances will result in case of a car or labor shortage, both of which seem imminent.

Large steam consumers throughout the country are disposed to cover their fuel requirements against a possible price increase. Important railroads are accumulating reserve supplies. The first general cold snap will precipitate a vigorous buying movement.

Tonnage statements of the big coal carriers are also showing a substantial increase. For example, the Norfolk & Western coal shipments increased from 2,200,000 tons in April to 3,000,000 tons in August. The Chesapeake & Ohio is showing a similar well-sustained improvement, while the Baltimore & Ohio is moving coal at the rate of nearly half a million tons per month more than during last year.

Even in Ohio the coal industry has taken on a new lease of life. The average percentage of operations for all Ohio districts has jumped from 34 per cent. to 47 per cent. full-rated capacity.

About two weeks ago "Coal Age" asked 1000 prominent coal-mine owners and managers to forecast business in their fields this fall and winter. The replies are from every coal state in the Union and are almost universally favorable. At this writing 102 forecasts have been received, of which number 89 companies anticipate good business this fall and winter. When it is remembered that coal men generally are not a hopeful lot, the overwhelmingly optimistic opinions are significant.

Subsequent issues of "Coal Age" will give a detailed analysis of the American coal situation and prospects as viewed by the important men in the industry itself.

Ideas and Suggestions

Putting the Old Men Out

In our present-day industrial life efficiency is the watchword everywhere. To produce this a process that we might call "put the old men out and the young ones in" is often ruthlessly employed.

A famous scientist recently declared that about 60 years is the limit of a man's usefulness. He established this arbitrary line as a basis to determine the fit from the unfit, but we fear his deductions were drawn from too little experimentation. Probably using 60 years as a limit was intended to incite and stimulate the contented middle-aged man to work for a vigorous old age.

In the coal-mining industry we have today and have had scores of recognized men who do things and see that things are done who are well past the 60-year mark. Because of their lessened physical resources let us not forget their vigorous mental powers, their tempered sense of duty and their precious practical knowledge gained in the school of life.

The older men have made our prosperous institutions what they are and the younger ones should not be too eager to depose them, as their time to prove their worth will also come. Let every employer judge his employee solely by efficiency, not age.

⁂

Human Equation in Mining

By Forney L. Parker

In transporting coal from the solid to the breaker it is human power rather than mechanical power that does the essential work, and yet it often happens that more consideration is given to the mechanical machine than to the human machine. We strive to keep our mechanical devices efficient by painstaking tests and records, while man is allowed to choose his own groove and follow it.

We keep cost sheets and records of coal produced per man and per period of time, but we have only a general idea of the hundred-and-one details that occur in getting the coal from the solid to the mine car. For instance, a breastman working in a pitching and gassy seam will often carry a poor brattice because he thinks it will take too much time to make it air-tight, or because the buddy who taught him mining did it that way. The result is that as the face progresses the air short-circuits through the leaky brattice and his place will be blackened with gas, which not only means a loss of time and money to himself but also a loss of perfectly good coal to the company. If the miner had received the proper instruction or his place had received adequate inspection while he was at work, this would not have occurred.

It is well for the superintendent to study the attitudes of his employees. Attitude is rather hard to define. By a bad attitude we mean laziness, shiftlessness and lack of interest, while good attitude we designate as industry, application and enthusiasm. These bad attitudes are developed by circumstances and by following the line of least resistance, and unless a strong influence is exerted to change them we cannot have the efficient employee.

To give the employee sufficient motive to accomplish his task in a thoroughly efficient manner, wage probably has more influence than anything else. It is hope of reward rather than fear of penalty that brings forth the best efforts in the miner. While increase of wages, which is probably best accomplished by the bonus system, is the most effective, a comfortable home, with congenial surroundings and pleasant diversions, will furnish good incentives for efficient work.

When an individual is brought to a realization of the interest that is being taken in his welfare he will give his full measure of devotion to his work, and not before.

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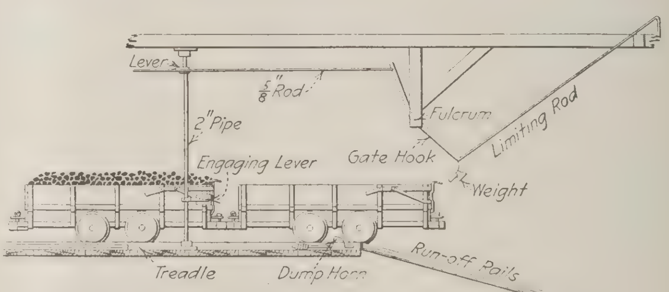
Automatic End-Gate Lifter

The accompanying sketch illustrates a simple method of automatically releasing the gate of a mine car after it has been dumped and is in the act of being replaced by a loaded car on a Phillips crossover dump. The advantage of the method shown over that of the overhead lever which drags over the coal topping, similar to that submitted by A. W. Hesse in *Coal Age*, No. 9, Vol. 8, is that no coal is scraped off in front of the dump when used at mines where the coal is built up above the top board of the car.



SHOWING DETAILS OF END-GATE LIFTER

The arrangement here depicted is now being used at Mine No. 2 of the Wasson Coal Co. in Saline County, Illinois, and operates in an entirely satisfactory manner.

The exact method of installing this release may be varied to suit the material at hand. In the installation referred to the gate hook is of a common type and is made of 2x½-in. iron. This is suspended so that its normal position is not quite vertical when ready to engage the hook on the mine-car gate and is fitted with a small weight to assist its quick return to engaging position, being limited in this movement to the proper position by the limiting rod, which is ½ in. in diameter, bent into a hook which passes over a timber. The vertical axle, to which are connected the arm which the cars strike and the lever which swings the hook back by its pull on the

⅝-in. connecting-rod, is a 2-in. pipe set in end plates. Both levers are 2x½-in. iron, bent to fit the pipe and fastened to it by through bolting.

The position of the vertical axle must be such that the "engaging" lever is struck by the front end of the car as soon as the treadle rail is depressed and the horns spread to release the empty car. The length of the levers will depend on local conditions. Although it might appear that the connecting-rod pulling at an angle would give trouble, as a matter of fact in the installation mentioned the operation is smooth and quick and can be worked by hand.

⁂

Coal Should Be Mined but Once

By N. G. Near

After coal is once dug out of the ground by the laborious process of mining, it should never be allowed to touch the ground again; at least it should not be handled by hand again, for hand labor is inefficient.

From the minute the coal is thrown into the mine car it should be in a state that permits of mechanical handling. If coal is dumped onto the ground at any time and must be shoveled by hand, the mining process is virtually repeated, and it is that process which makes coal most expensive.

No matter what your business—mine operator, middleman or retail coal dealer—bear this principle in mind: Coal should be mined only once.

⁂

Time Wasters

By Pennsylvania Engineer

Almost every mining town contains a certain proportion of inhabitants who are time wasters. They are generally in evidence close to the company store or at some other central point where they are sure to find others of their kind.

The time wasters are a purposeless crew. They are generally devoid of any desire to get ahead, and make no effort in that direction, even though their talk often indicates that they are highly dissatisfied with their condition. However, instead of putting their time to good use, they find it more to their liking to give vent to their thoughts and opinions in the presence of others like themselves who feel that they have nothing better to do than to listen to them.

Self-Praise the Common Vocation

The talk of the time wasters covers a wide variety of subjects. A topic of prime interest concerns the operation of the mines; the inevitable mistakes of the superintendent or the mine foreman are subject to the most minute examination and criticism. Any one of the time wasters could tell how to avoid these mistakes and how to operate the mines more economically and efficiently. Another subject of great importance to each speaker is his own special ability in some particular branch of mine work. In his enthusiasm this fellow is quite apt to spread his praise of himself over so many different kinds of work that even his easygoing hearers lose patience. Moreover, his story is not told once but on every possible occasion when he can get away with it. In fact, the whole tendency of the time wasters is to lose their sense of proportion, which results in their greatly exaggerating things of slight importance.

Serious discussion makes for strengthened brain power, and it likewise awakens clear thinking. The difficulty is, however, that the environs of the store corner and the usual dispositions of the time wasters do not contribute to helpful discussion. A combination of narrowness, unenlightened opinion and a certain amount of profanity does not constitute serious talk, however forceful the speaker. An open-minded, thoughtful discussion of some matter of vital concern is not what is wanted by the time wasters; it is more spicy, and productive of further comment, to hear someone break in with remarks of a prejudiced nature.

Ambition Is Ridiculed

The meetings of the time wasters are not without their amusements. Many funny events occur every day which furnish subjects for conversation. The fellow who occasionally makes a foolish mistake comes in for his share of the laughter. The time wasters also derive much amusement from the comments concerning the more ambitious element of the town. If there happens to be a night school in session, it is real sport, in their opinion, to pass remarks about the "school boys" as the latter go by on their way to the classroom. The best feature of this "fun" is the fact that it is continuous. As the "school boys" improve their opportunities and make their way forward and upward their places are filled in the school by other ambitious lads, and they in turn become the object of comments by the same old crowd of time wasters who remain stationary at the corner store.

The disadvantage that comes to the time wasters is of course mainly in the opportunities lost during the periods that could have been devoted to some more helpful occupation. The hours that could have been used making improvements about the home, in reading or in study are gone. That is unfortunate; but there is another feature that is as bad, if not worse. The time wasters by their continued presence in their favorite haunts encourage their younger hangers-on to become confirmed in the same state of inefficiency. These lads look forward to the time when their opinions will be listened to and they may claim their regular places with the others.

Public opinion cannot hold the time wasters in high regard; nor can the officials of corporations look to them when choosing men for promotion. It is a well-founded assumption that any man who wastes his time in listless gossip at the corner store is not fitting himself for advancement. And in the present day, when night schools are more widely established, when excellent textbooks may be obtained and when the technical press supplies papers suited to almost every industry, the time waster is looked down upon more than ever.

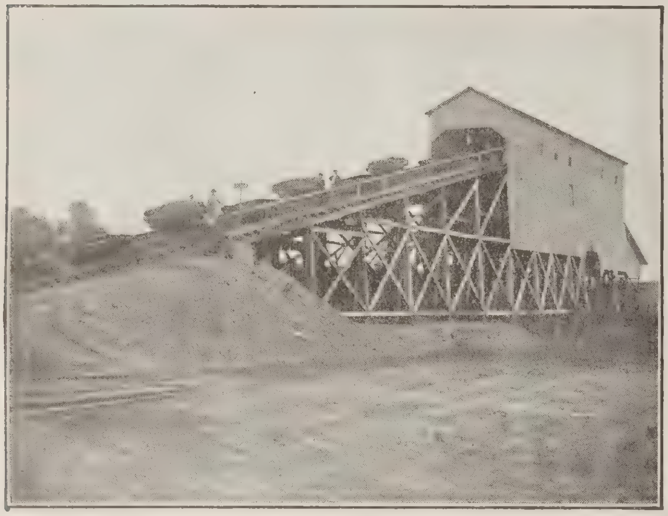
⁂

Miner's Helper as Operator's Employee—Helpers employed by miners with the operator's permission are entitled to the same degree of consideration from the operator as to their safety as is due the miners, where it appears that the operator keeps account of coal loaded by the helpers and pays them, deducting the amounts due them from the amounts due the miners, and that the helpers are subject to the control of the operator the same as the miners. (Kentucky Court of Appeals, Small vs. Borderland Coal Co., 170 Southwestern Reporter 8.)

A Slope Mine in Illinois

SYNOPSIS—Contrary to the usual custom in Illinois the coal is reached at this operation by means of a slope. Loaded and empty car-hauls driven by an electric motor take the place of hoisting engines and cages, with a considerable saving as well as greater safety and convenience.

The Wasson Coal Co., of Harrisburg, Ill., is one of the few coal companies in the Middle West that has been prospering and opening up new fields during the last year. The stockholders have received substantial dividend checks regularly; large sums have been spent for improvements in the old equipment, and a new mine has been developed and equipped during this time. All this goes to show what it is possible to accomplish by good management and an efficient organization such as this company has developed.



THE CAR HAUL IN OPERATION

In the equipment of the new mine, which will have an output of about 2,000 tons per day, the management has indicated its progressive disposition by a radical departure from the established custom of sinking vertical shafts. An incline was driven to the coal and a car-haul installed to bring the pit cars from the mine to the tipple. So far as is known this is the only installation of its kind in the Middle West. There are car-hauls, however, which are entirely above ground or in connection with drift mines.

This plant is situated on the open prairie, a condition typical of most Illinois mines. The management was fortunate in locating a spot where the coal "crops out" to within about 30 ft. of the ground surface and where it has a good slate roof. The coal seam is about 4½ ft. thick and although on a gradual slope, the haulage, handled by locomotives, is not hampered.

The accompanying view of the No. 2 mine shows the car-haul in operation. This haul is also of interest, in that it is one of the largest in operation in the whole coal-mining industry. It is constructed of two high-grade steel chains, one for the loaded cars and one for the empties, operated by a 75-hp. motor. The motor is controlled by the men in the weighhouse, who start and stop the haul when under full load, as required to accommodate the men that load out the railway cars. The empty haul is driven by chain and sprockets from a countershaft of the loaded haul.

The chain on the loaded haul operates at a speed of 60 ft. per min. It is on an incline of 14 deg. 30 min., has a working stress of 25,000 lb., and is equipped with four-wheel gravity tilting spurs. This chain is 18 in. pitch, every second link being composed of drop-forged steel. The alternate links consist of two "30 to 40 carbon" steel bars. The pins are of 1¾ in. diameter.

The chain was designed for the working load given, on a conservative basis, and large factors of safety were employed. Safety dogs have been provided on the supporting structure of the loaded haul. If a car should get away and start down the incline, it could not go more than a distance equal to a little over its own length before engaging one of these stops. The length of the haul is 365 ft. from center to center of head and foot shafts.

The chain on the empty or down-haul operates at a speed of about 85 ft. per min. and is also equipped with four-wheeled gravity tilting spurs. The distance center to center of head and foot shaft is 325 ft. The chain is made of high-carbon steel bars.

A caging device is provided at the foot of the loaded haul, thus making it possible for a man to deliver cars to the haul, one at a time, at proper intervals to engage every spur on the chain. The track in the entry is on a slight grade to this caging device, while the track leading from the empty haul is on a slight inclination back into the entry. These grades favor the haulage locomotives materially. At the head of the hauls, in the tipple, a crossover dump and kick-back are provided.

The points that the operators claim in favor of this equipment are:

1. First cost is no greater than that of hoisting engines, cages, etc., necessary for a vertical shaft.
2. The services of a hoisting engineer are dispensed with.
3. The miners walk into the mine through a passage alongside the haul and are not subject to dangers of falling cages, etc.
4. The men are free to enter and leave the mine at will, without waiting for a hoist.

This haul was designed and furnished by the Jeffrey Manufacturing Co., of Columbus, Ohio, which makes a specialty of coal-handling equipment.

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Coal Production of Kansas

The production of coal in Kansas in 1914 amounted to 6,824,068 short tons, according to the Geological Survey, with a value at the mines of $11,181,687. This is a decrease of 5 per cent. in quantity and 7 per cent. in value from the output of 1913. In other respects, however, the year is reported to have been satisfactory to the coal men, no serious strikes or flooding of pits having interfered with coal mining in the state during the year.

Some improvement in the dangerous practice of shooting from the solid is shown for Kansas, the coal mined by this method in 1914 being 77.3 per cent. of the total output as compared with 80.5 per cent. in 1913.

The number of men employed in the coal mines of Kansas in 1914 was 12,413, and they worked an average of 191 days against 12,479 men for an average of 197 days in 1913. The average production per man in 1914 was 550 tons and 2.88 tons for each working day.

Large Stripping Operation

By Frank H. Kneeland

SYNOPSIS—At Ebervale, Penn., a bed of coal which was abandoned many years ago—being supposedly worked out—is being in large measure reclaimed by stripping. Unlike most operations of this kind, this work is being done on a salvage basis. Under present conditions by using modern methods as much as 8 cu.yd. of earth may be moved in order to secure 1 cu.yd. of anthracite coal.

The surface mining or quarrying of coal is probably the oldest form of coal production. Like most other forms of mining, however, it has undergone considerable development from the primitive methods at first employed in this operation.

The usual conception of a strip pit is that the coal occurs under shallow cover, which may easily be removed by means of horses and carts, wheeled or scoop scrapers, or even by wheelbarrows. Of late years, however, the steam shovel has been used with great success in stripping operations and has rendered possible the extraction of coal which could not be secured by any other means. Furthermore, some modern strip pits could hardly be termed shallow.

At Ebervale, near Hazleton, Penn., the Central Pennsylvania Quarry, Stripping and Construction Co. is engaged on what is called its No. 5 coal job for the G. B. Markle Co. This is one of the most extensive and most costly stripping operations in the United States, as well as being the only one worked on a salvage basis.

In the vicinity of Hazleton the Mammoth or Big vein of anthracite lies in a basin in the bottom of a valley, upon either side of which it outcrops. This coal measure was one of the first, as well as one of the richest, to be worked in the anthracite region, and the particular property in question was worked out and abandoned many years ago. At this point the Mammoth coal bed is approximately 30 ft. thick. Beneath it lies the Wharton vein, which is about 4 ft. thick and of slightly inferior quality. The Wharton is separated from the Mammoth bed at Ebervale by a stratum of rock about 12 in. thick. East and west of this point, however, this rock increases up to between 6 and 8 ft. in thickness.

As has been said, the coal at Ebervale had been worked out and abandoned many years ago. The headings and breasts of the original mine were driven in the Mammoth vein and on account of the weak roof the miners were compelled to leave the top benches of this measure. Consequently the breasts driven were 30 ft. wide and 18 ft. high. Furthermore, as the breasts approached the outcrop the cover became too thin and broken to be readily supported, and they were consequently abandoned some distance from the actual outcrop. The Wharton vein was untouched in the original workings.

It will thus be seen that as a matter of fact the basin at Ebervale contained a considerable amount of perfectly good coal at the time it was abandoned. In the Mammoth vein this consisted of the top and bottom coal of breasts and entries, all pillars, and a strip of virgin coal around the outcrop that could not be safely mined by underground methods. It also included the entire contents of the Wharton coal bed.

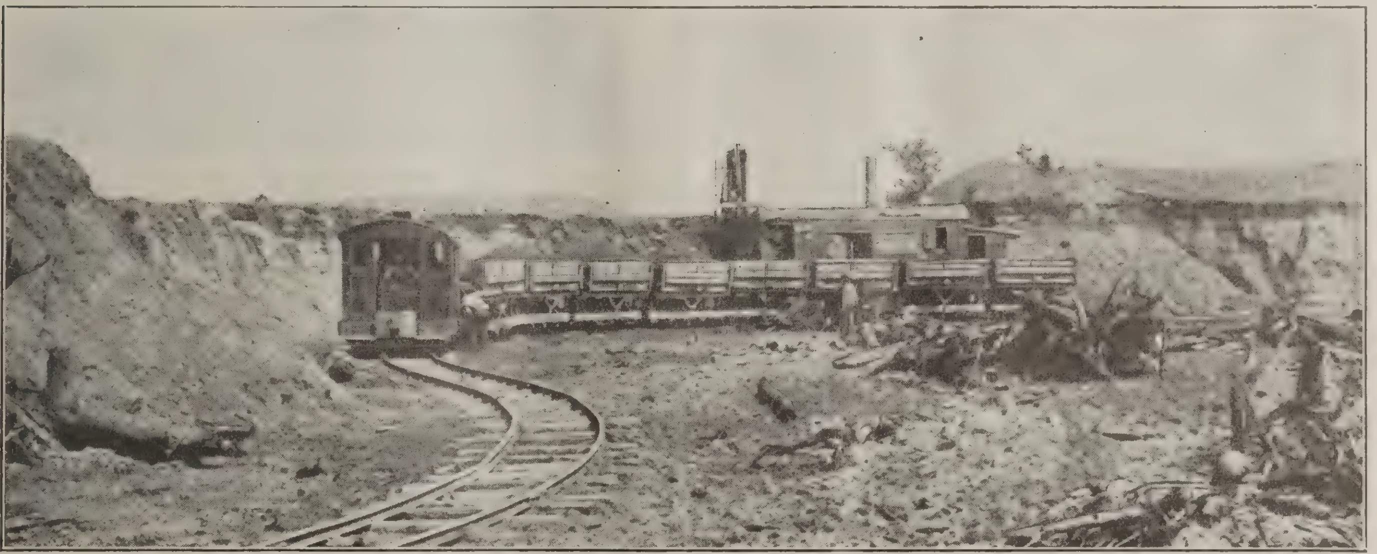

FIG. 1. A STEAM SHOVEL REMOVING CULM FROM A LARGE BANK AT EBERVALE

After being abandoned, the old workings in many instances caved in and became filled with broken rock, clay and silt. The ground above the old mine, except that which was covered by a culm bank, supported a considerable amount of second-growth timber, but was full of cave holes, marking where rooms or breasts had been driven. As it was believed that the available mineral wealth of this property had been exhausted, the land above the old workings lay utterly idle, as it was neither safe for building purposes nor fit for cultivation.

The owner of this land found himself in a predicament. His property was taxable but nonproductive, nor except

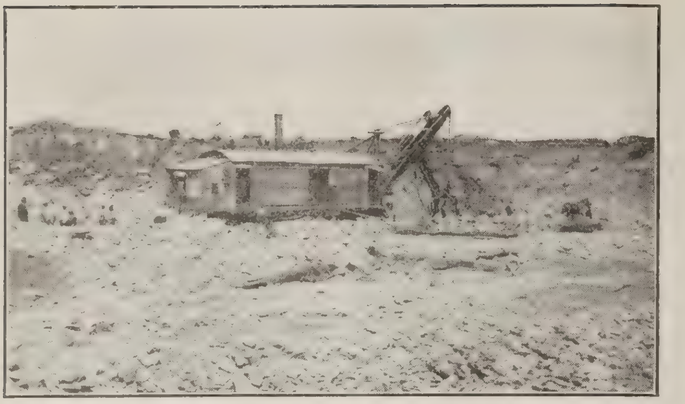

FIG. 2. A STEAM SHOVEL AT WORK IN STRIPPING

for the culm bank previously mentioned was there reason to believe that it might ever become otherwise, or at least not within the span of ordinary human life.

Then about four or five years ago David Benjamin and Charles E. Butler, operating heads of the Central Pennsylvania Quarry, Stripping and Construction Co., men of wide experience in the stripping of anthracite coal, got an idea and simultaneously an inspiration. After carefully going over the ground and learning all the facts so far as possible, they came to the conclusion that with prices and market conditions then prevailing the coal still remaining in this abandoned property could in large part be successfully reclaimed on a salvage basis. They accordingly entered into a contract with the G. B. Markle Co., which held a lease to the property, whereby they were to strip and deliver the product to the nearest Markle breaker, receiving therefor a certain price per ton.

Stripping was started July 11, 1913, and the first coal was sent to the breaker on May 9, 1914. Thus almost a year of steady outlay, amounting to about $200,000, and the moving of 1,000,000 cu.yd. of material were required before one cent was realized. At the present writing the center section of this stripping is 1500 ft. long, 800 ft. wide and has a maximum depth of approximately 160 ft.

The culm bank previously referred to is now being removed by steam shovel and prepared for market. This culm consists mostly of small sizes of coal, and only a small percentage of the entire bank is as large as chestnut. The ground upon which it is located will eventually be stripped, as well as a large portion of the remainder of the property.

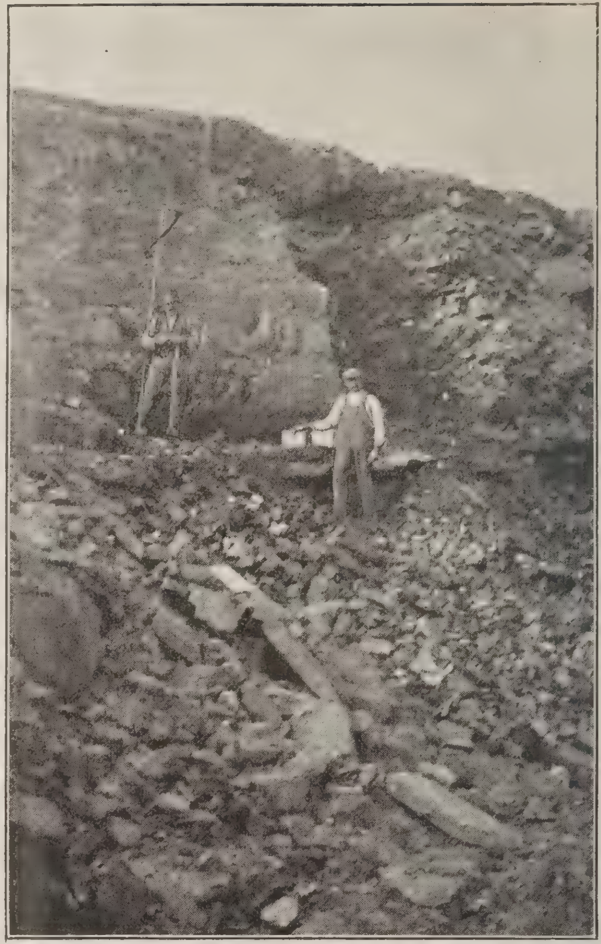

FIG. 5. PREPARING TO "SPRING" A HOLE BEFORE BLASTING PILLAR OF COAL

The stripping of an old mine is accompanied by many difficulties and dangers not encountered in removing the cover from virgin coal. Much of the ground over entries, rooms and breasts has caved in. Sometimes this breaking of the strata continues to the surface, resulting in a cave hole. In other instances the caving extends only part way up. In case the caving is complete, resulting in a hole or depression on the surface, the ground where the cave has taken place is always soft, yielding and treacherous. It often becomes necessary in such a place—over which a steam shovel must operate—to cover the caved ground with a mat of poles. Sometimes one set of such poles, 6 to 8 in. in diameter, laid parallel to each other and from 12 to 24 in. apart, is sufficient to support the weight of the shovel. Often, however, two

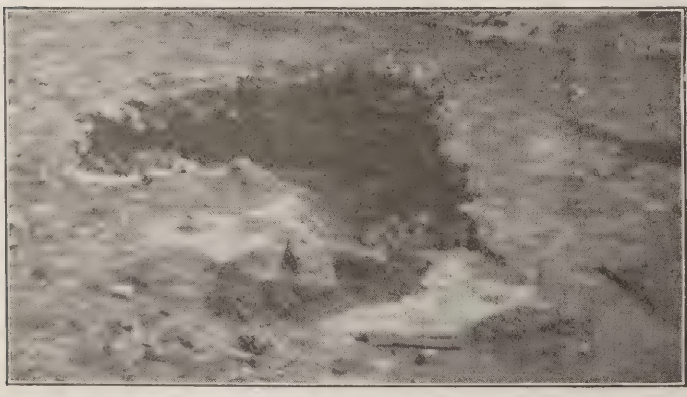

FIG. 3. RESULT OF CAVING UNDER THE SIDE JACK OF A STEAM SHOVEL

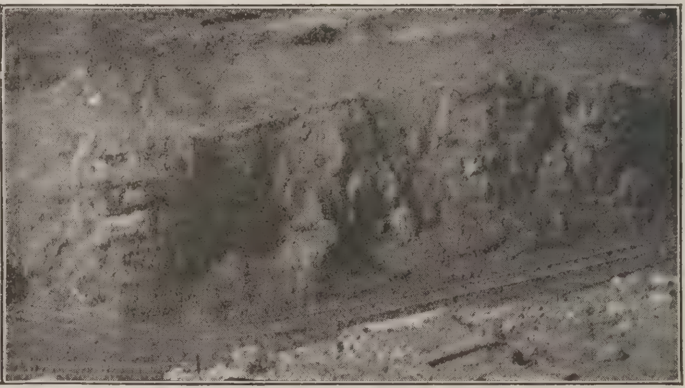

FIG. 4. PILLARS OF COAL ALTERNATING WITH OLD BREASTS FILLED WITH CLAY AND ROCK

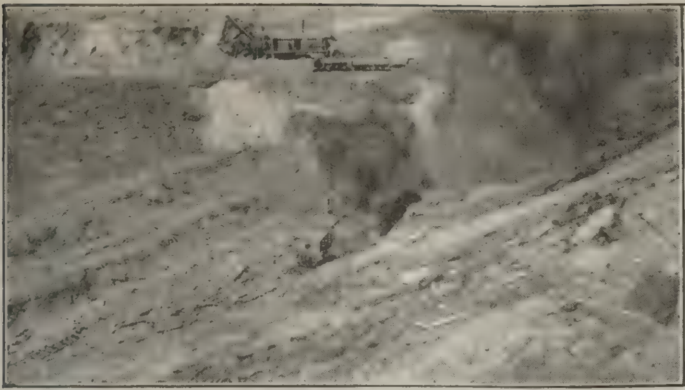

FIG. 6. "MUD CAPPING" HARD ROCK IN FRONT OF A SHOVEL

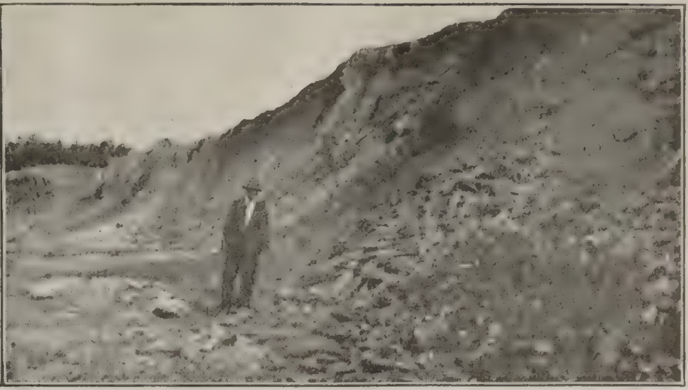

FIG. 7. PRACTICALLY VIRGIN COAL NEAR THE OUTCROP

or three sets laid at right angles to each other are required. Of course after they have served their purpose these poles may be pulled out and used over again in a similar contingency.

Sometimes the caving of an old breast may not extend entirely to the surface, giving no indication of danger. Under the weight of the steam shovel, however, particularly under the action of the side jacks, such ground is liable to cave suddenly, either engulfing the shovel or tipping it over. It is sometimes possible, however, where the caving takes place under a side jack, to catch the machine and prevent its leaving the rails by quickly pushing against the ground with the dipper. Bad accidents and nasty upsets have more than once been prevented by this method.

Ten Men Make Up a Shovel Gang

At Ebervale each steam shovel is operated by a gang consisting of 10 men. This includes one shovel runner, one craneman, one fireman, four jackmen, one coal man, one spotter and a night watchman. The shovel runner and craneman control the movements of the dipper. The runner operates the engine which raises and lowers the dipper, as well as the one which swings the boom. The craneman operates the crowding engine, thus regulating the depth of the cut taken by the dipper, removing it from the bank when it is full. He also trips the bottom, which discharges the dipper contents at the proper time. As the output of a shovel depends entirely on the combined skill of these two men, they learn to work in what might be termed synchronism, each performing his duties in perfect conjunction with the other.

The engineer or shovel runner is in charge of the shovel. He sees that the jackmen have the road ready in front of the shovel so that no time is lost in moving up to new work, also that the jacks are properly placed and tightened and that care is exercised in moving. The fireman not only keeps up steam but in large measure cares for the hoisting and swinging engines. He sees that the machinery is properly oiled, that grease cups and lubricators are kept full and that proper water connections are made and maintained.

To the coal man is intrusted the duty of keeping the shovel supplied with fuel. Before the coal was reached at this operation fuel was hauled to the shovels in carts. Since that time, however, it has only been necessary for the coal man to pick up and carry the needed amount of coal to the shovel. As the quantity of this fuel-coal is almost infinitesimal as compared with that produced, it is furnished gratis by the owner of the property.

The material excavated by the steam shovel in stripping the coal measure is hauled to the dump by "lokies"—small steam locomotives—each handling a trip of from five to eight cars of 4-cu.yd. capacity each. The runner or engineer usually has a fair knowledge of the mechanism of his engine, and as severe grades are encountered, no small amount of skill is required to haul or push the cars over them. Each lokie runner does his own firing.

The "spotter" is a signal man. He indicates to the lokie runner the exact position in which to place each car at the steam shovel in order that it may be most advantageously loaded. He also removes from the cars dangerous overhanging material and cleans the track of rock and dirt spilled upon it.

Of course in a strip pit the roads have to be changed frequently; consequently a gang of roadmen is kept busy

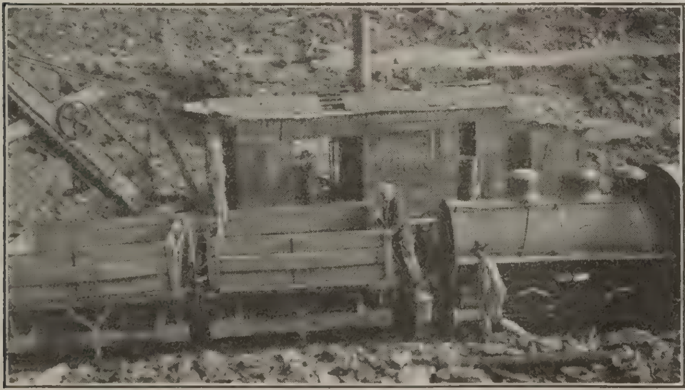

FIG. 8. LOADING COAL FROM THE VEIN BY STEAM SHOVEL

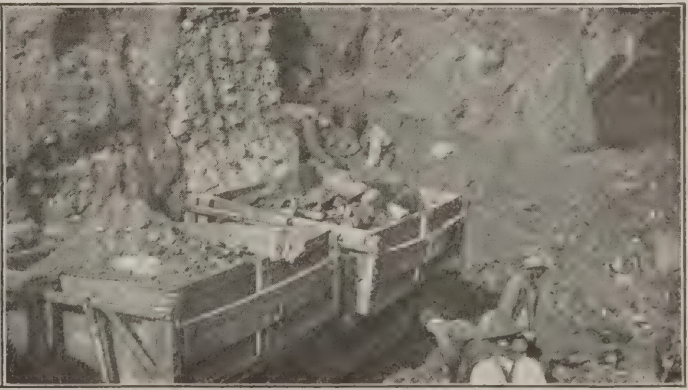

FIG. 9. TRIMMERS THROWING ROCK AND REFUSE FROM COAL CAR

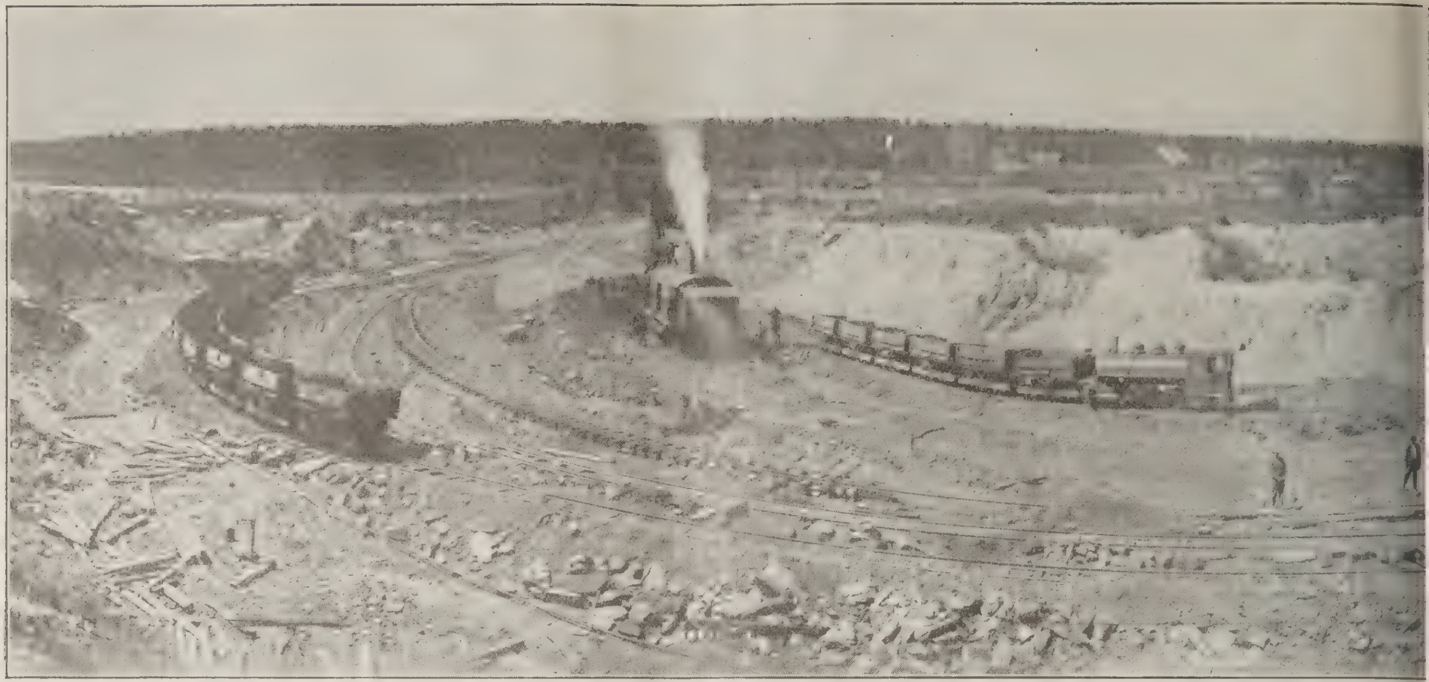

FIG. 10. A PANORAMIC VIEW, SHOWING PART OF THE STRIPPING OPERATION AT EBERVALE. FIVE SHOVELS AND 35 LOCOMOTIVES ARE

either building new tracks or repairing those which have become defective. Considering the temporary nature of the trackage, little trouble is experienced from derailments.

When a trip of loaded cars reaches the dump or spoil bank, a dump gang, consisting of eight men, quickly discharges the contents of the entire trip. The cars are of the side-dump variety and can discharge from either side. All spoil banks are so located that they will never interfere with possible future operations.

After the dirt has been removed from above the coal the latter is loaded into cars by means of steam shovels. Of course it is impossible in an operation like this, where a part of the coal has been removed by underground mining, to avoid a certain admixture of clay and rock. If the proportion of rock is above a certain amount the material is sent to a separate spoil bank which will eventually be worked over, the material being washed and otherwise mechanically prepared for market. This spoil bank is estimated to contain about 40 per cent. of coal, the remainder being dirt and rock.

As was stated, the Wharton coal bed, about 4 ft. thick, underlies the Mammoth, being separated therefrom by from 12 to 18 in. of slate. The Wharton vein contains a hard and tough black rock parting, locally known as "the nigger." This as well as the slate separating the two measures and the hard strata, sometimes encountered above the coal, is too tenacious to be readily dug by the shovel. These strata are therefore shattered with dynamite and powder and both coal measures loaded together.

To prevent an excessive amount of rock being loaded with the coal, two or three trimmers are employed at each coal-loading shovel. They pick the larger pieces of rock from the coal as the material is loaded. Of course the shovel operators become quite skillful in handling the dipper and are able to leave the larger portion of the rock on the ground.

When a trip of coal cars is loaded it is hauled to Jeddo No. 7 breaker, where it is prepared for market. The distance from the point of loading to the breaker is about a mile and a half.

The wages paid to the men at Ebervale are considered fair and equitable for the anthracite region. Laborers receive $1.65 per day and up; lokie runners, $2.42; cranemen, $3.10, and firemen, $2.10. Foremen receive $100 per month, while shovel runners draw $140 a month.

In a good day's run, devoid of accidents, one steam shovel with a 2½-cu.yd. bucket will load 350 cars with rock and earth. As each car holds 4 cu.yd., this is equivalent to about 1400 cu.yd. of material handled. An accident, such as a derailment, causes a serious break in the organization and may greatly diminish the day's output. The men, however, become quite skillful in replacing cars on the track, and where great speed is required—as where a derailed car will hold up a trip—a lokie is frequently employed to facilitate replacing the car. For this purpose the front set of wheels is spragged and a chain or cable is made fast to the top of the car box upon which the locomotive pulls. This raises the rear set of wheels clear of the ground, when they may be swung to a position over the rails and lowered upon them by the lokie giving slack. The wheels on the track are then spragged, while the locomotive, by pushing on a pipe set against the upper portion of the car, lifts the front set of wheels, when they may be swung upon the track in a similar manner.

If the derailment occurs at or near the steam shovel, a chain attached to the car and hooked over a tooth of the dipper may readily lift a car, or one end of it, onto the track, when the other end may be similarly lifted into place. The locomotives are often employed also for pulling short sections of track into position. In short, the men at a strip pit soon learn to utilize the various machines to suit their convenience, and thus minimize the time lost through accidents.

The stripping at Ebervale was begun in 1913 with two 2½-cu.yd. steam shovels. There are now on this single operation 10 steam shovels—5 stripping, 4 loading coal

TEAM SHOVELS AND SEVEN LOCOMOTIVES ARE PLAINLY VISIBLE IN THIS PICTURE. TEN STEAM
MPLOYED AT THIS OPERATION

and 1 loading culm. There are also 35 locomotives, about 300 cars and something like 20 mi. of rail. The company operating at Ebervale has in all nine stripping operations under way in the vicinity of Hazleton, all of which except this one are worked on a yardage basis. These various operations require 28 steam shovels, 25 of which are Marion, with 3 Bucyrus machines; 100 locomotives, which were built by the Vulcan Iron Works, of Wilkes-Barre, and about 1,000 cars, which were built by the company in its own shop. These are all of 4-cu.yd. capacity and of 36-in. track age. The company maintains its own shop in Hazleton, where cars are built and repairs to practically all the equipment made. It also maintains its own engineering corps.

During the past 12 years the Central Pennsylvania Quarry, Stripping and Construction Co. has moved, including coal, approximately 72,000,000 cu.yd. of material, and has now under contract enough more work to bring its yardage to an amount exceeding that moved in the building of the Panama Canal.

The foregoing clearly shows the vast amount of equipment necessary successfully to prosecute stripping operations on a large scale. A few years ago it was considered that 4 cu.yd. of earth could be moved in order to secure 1 cu.yd. of anthracite. At present this ratio has increased to approximately 8 to 1.

The depreciation of equipment on a stripping operation is high, in some instances as much as 25 per cent. being allowed for depreciation and repairs.

The men who can shoulder and carry to a successful conclusion such an undertaking as has been described must possess certain personal qualities in superabundance. They must be either naturally or by training civil engineers, level-headed business men, good organizers, able executives, and finally they must be able to win and hold the confidence and loyalty of their subordinates and employees. From the financial standpoint, also, it requires nerve to start such an extensive undertaking where the exact nature of the rock overlying the coal measure is not and cannot be definitely known. A nest of boulders or an accumulation of hard conglomerate, either of which would require extensive blasting, might easily turn a contractor's profit into a considerable loss.

Of course the contract to remove the coal from the worked-out area at Ebervale was undertaken primarily that profit might accrue to the people who did the work. It should not be overlooked, however, that by this means coal is produced cheaply and safely, and practically all of the fuel in the coal-bearing measures is reclaimed, and none of the wealth with which Nature has so richly endowed this vicinity is wasted through imperfect and extravagant mining methods.

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California Is a Producer of Coal as Well as Oil

Although California oil has to a large extent displaced the use of coal as a fuel in the Pacific Coast States, two California mines reported an output of coal in 1914. In order not to reveal the individual output of these mines their production is grouped with that of the one producing mine in each of the states of Idaho and Nevada, and the total combined production of the three states in 1914 is given at 13,974 tons, valued at $39,821, according to the Geological Survey.

Coal mining and the coal trade generally in California lay little claim to importance among the industries of the state, particularly since the beginning of the present century, when the production of petroleum began to exert so powerful an influence on the fuel consumption of the Pacific Coast. From 1910 to 1912 inclusive, the coal production of the state was only a little more than 10,000 tons in each year; in 1913 work was resumed on the Stone Canyon properties in Monterey County, and the production increased to 24,839 short tons, valued at $84,073. The output of 1914, however, showed an appreciable decrease. The only other production in 1914 was from the Ione mines, in Amador County.

Correct Tipple Design--II

By M. L. Hyde*

SYNOPSIS—The second and final article on this subject. The advantages of the jigging conveyor are here taken up and an imaginary and ideal tipple is described in detail.

In a well-designed tipple the picking tables for handling nut and slack should allow of bypassing their entire contents for a given period of time, direct to either bins or boiler-room conveyor. This necessity arises when a loader sends up an exceedingly dirty car of coal; for while the lump and egg can be hand-cleaned during the time allotted for their passage through the picking room, yet to get all the dirt from the nut by hand would hold up the tipple such a length of time as to more than offset the small value of the coal won; therefore no time should be lost in side-tracking this undesirable product.

Tables should also permit the bypassing of smaller grades to a transfer conveyor, which can in turn discharge to conveyors leading to such auxiliaries as the washing plant, rescreening plant, coke-oven supply bins, etc. Not only the small grades, but the lump as well, should be easily diverted in case locomotive coaling stations or storage bins are installed.

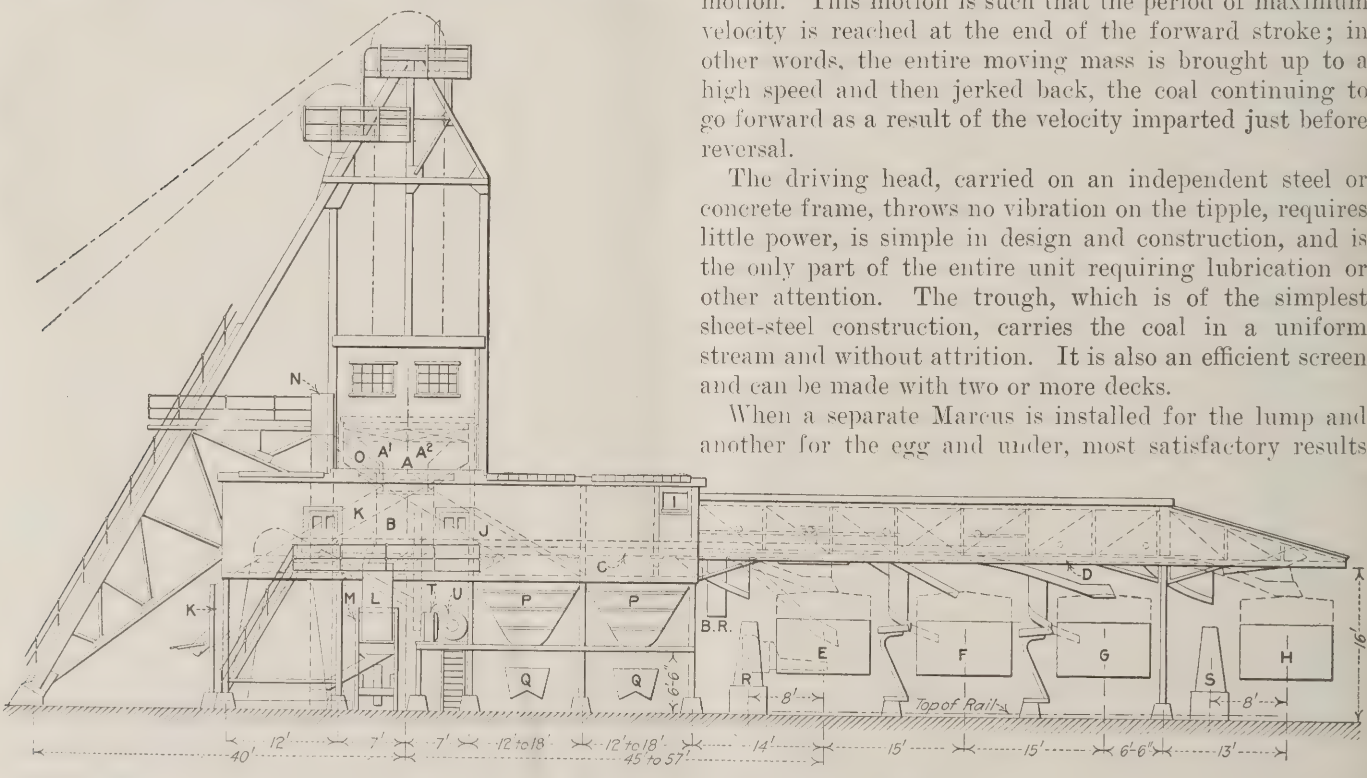

FIG. 3. A SIDE VIEW OF AN IDEAL TIPPLE

More elastic than the apron and less costly is the drag conveyor. If designed with bar scrapers of the same depth as the chain links—say 3 or 4 in.—it will carry coal in a uniform stream of whatever depth fed by the preliminary screens. As far as attrition to the coal is concerned, it is doubtful if the most careful check would disclose a loss to any grade. With very friable lump, dragged at 40 ft. per min. over a distance of 100 ft., the writer, after numerous tests, failed to observe any loss or any accumulation of fines.

The drag carries equally well on either strand, is light, easily installed, can discharge at any point in its entire length, and do it with a gentle forward pushing of its load. This is an utter impossibility with the apron, the discharge of which over the head sprockets is the roughest of any table on the market.

The drag requires the same lubrication from end to end as does the apron, and is rather high in power consumption. In every other way it is the better table.

Standing in a class indisputably alone is the horizontal shaking table, marketed under the trade name "Marcus" by the Roberts & Schaefer Co., Chicago.

The Marcus consists of a steel trough from 3 to 6 ft. wide with 10 in. high sides, the whole riding on a series of 9-in. floating rollers, which are held to their runways by springs leading from their axles to the trough and to the supporting structure. A self-contained driving head, belt-driven from a motor, gives the Marcus its jigging motion. This motion is such that the period of maximum velocity is reached at the end of the forward stroke; in other words, the entire moving mass is brought up to a high speed and then jerked back, the coal continuing to go forward as a result of the velocity imparted just before reversal.

The driving head, carried on an independent steel or concrete frame, throws no vibration on the tipple, requires little power, is simple in design and construction, and is the only part of the entire unit requiring lubrication or other attention. The trough, which is of the simplest sheet-steel construction, carries the coal in a uniform stream and without attrition. It is also an efficient screen and can be made with two or more decks.

When a separate Marcus is installed for the lump and another for the egg and under, most satisfactory results can be realized. The former allows of cleaning the lump, lip-screening it, and of loading with the utmost care either in open or box cars. With the lump car tracks located on the inside nearest the dump, this grade is given preference on the short travel.

The Marcus for the small grades should have two decks, permitting immediate removal of the slack to the bottom deck, where it travels to either cars or such bypass as may be desired. This leaves exposed, free from fines, for pick-

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*Pembina Coal Operators, Ltd., Evansburgh, Alta., Canada.

ing, the egg and nut, which can be further lip-screened before going to the cars.

The troughs should be 5 or 6 ft. wide, and if 24 ft. clear picking length is provided, 6 or 8 boys can work at the table and handle 150 tons per hour easily. With a very dirty coal this length should be increased to 30 ft. and more boys employed.

The Marcus carries and thoroughly screens either wet or dry coal, is neither dirty nor dusty, allows the boys to stand close against its sides, with no danger of their being hurt, and has all the advantages of the drag in discharging. It should be set to clear the rails 16 ft. as against 21 ft. required for the apron.

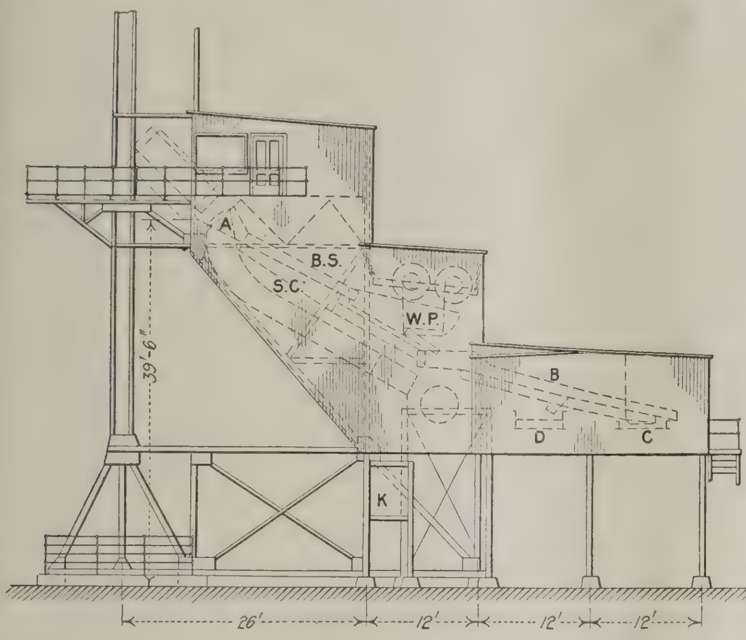


FIG. 5. END ELEVATION OF TIPPLE WITH BAR SCREENS

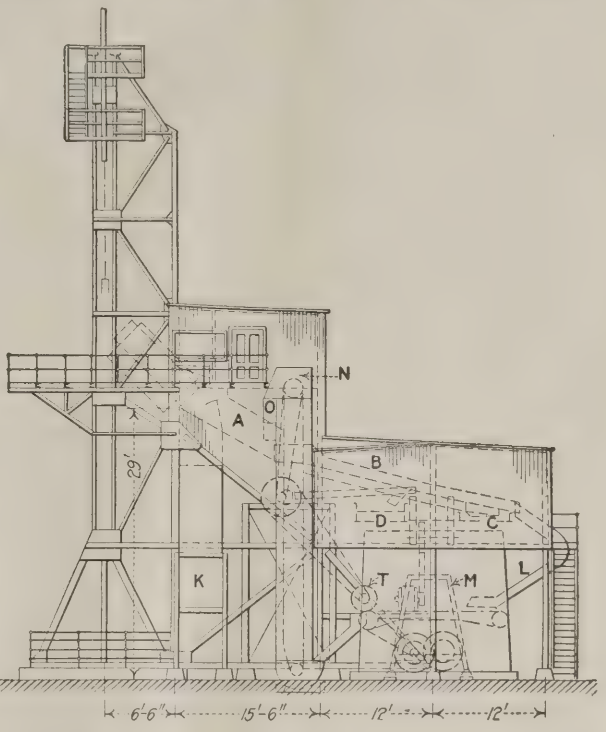


FIG. 4. END VIEW OF TIPPLE

In every way the Marcus fills a long-felt want on this continent, where for years we have spent our energies designing structure after structure, each more elaborate than the last, each with its complement of feeders, balanced screens, apron tables, hinged loading booms, revolving screens, etc. Each cost considerable money and all were ungainly and high in upkeep. With the advent of the Marcus necessity for them passed away.

In the loading chutes, because of the low clearance required for the Marcus over the railway tracks, material improvements can be introduced.

The hinged loading boom is today the most popular means of getting coal from the tipple to the car. On paper it is all the heart could desire. In actual practice it consists of one end of an apron conveyor carried between two trusses about 35 ft. long, hinged at one end to the floor of the tipple and suspended from an electric hoist at the discharge. Assisting the hoist are a series of counterweights and safety chains, for the weight of the loaded machine is enormous.

An operator lowers this boom to the bottom of an open car, starts the conveyor and slowly cones the coal up by raising the boom. It loads gently and uniformly. The average drop from boom end to coal is from 2 to 4 ft. Less than this will foul the boom on coal already discharged.

The first cost of this machine is excessive. It requires power drive, and where used for lump, should be used also for egg as well, since owing to the high elevation of the picking tables or screens discharging onto it (this elevation being required to allow the boom in raised position to clear the rails by 16 ft.) the chutes for carrying the egg to the cars would be unreasonably long and steep. It eliminates lip-screening, which is a most necessary adjunct of all lump chutes, for the rolling over of this grade during picking is sure to cause some fines, which must be removed before loading.

It eliminates also all chance of the satisfactory loading of box cars and of using box-car loaders. It requires an operator, is high in upkeep and is subject to serious damage if a car during the loading process should get away. To summarize, for the privilege of end-loading open cars, this complicated equipment is being installed at a cost many times the investment required for the Marcus, with its manifold advantages in every department.

The requisites of a loading chute should be ease in operation, simplicity, ability to cone the coal from top to bottom of any size or type of open car with a minimum breakage, ability to put coal through the doors of box cars without drop or jar between the picking-table discharge and that point. It should be easily hoisted to clear the rails by 16 ft. when not in use, and should be of a design permitting as little spillage as possible. Such a chute is shown in Fig. 9 and is later described.

Many operators are prejudiced in favor of end loading for open cars. Every advantage this system can show is fully covered in actual practice by the chute illustrated. This chute should be used for lump, egg and nut grades. Slack requires nothing more than a plain gravity type of chute without adjustment other than clearance when not in use.

All tipples should be equipped with box-car loaders for lump. This grade cannot be satisfactorily loaded by hand. When the mine's daily capacity exceeds 1000 tons, a loader should be furnished for the egg as well; if this is not done, three men will be required in a car loading any combinations with this grade as against one man with the loader.

The loaders recommended as being the gentlest in handling the coal, requiring the least power and being the easiest to operate and repair, are those made by the Manierre Engineering Co., of Milwaukee, Wis., and no operator should let his tipple contract without first personally assuring himself of the correctness of this statement. One type of loader can easily make from 1000 to 2000 lb. more slack in a car than another of better design; and the sales department well knows the trouble and dissatisfaction this may cause.

A Standard Tipple is Assumed

Fig. 3 shows a side elevation and Fig. 4 an end elevation of a tipple meeting all the demands imposed in the foregoing part of this paper.

This tipple has a capacity ranging from 750 to 3000 tons per day, no alterations being required except in the width of screen. Notice the clean roof lines, freedom from unsightly projections, common floor line, ease of getting at all sides of each machine and the complete lighting system. Compare the height of dump, 29 ft., with that of other so-called modern tipples. Regardless of the amount of rain or snow fall, the building is suitable and can be maintained in first-class condition at small expense.

While a shaft design is shown, the whole arrangement is applicable to drift or slope mines. The location of the dump hopper would be as shown, and the rotary dump or conveyor discharge arranged to suit.

The headframe is of the end-hoisting type which is preferable to the side hoist because of simplicity and small angle of fleet of hoisting ropes, allowing of a single-drum hoist. It has a landing stage at both the surface and the topman's office. Stairs to the upper landing and to this office are carried up the engine brace. All entrances are carefully protected with iron fences 6 ft. high.

Cages of the Wellman-Seaver-Morgan Engineering Co.'s make, or their equal, are recommended. Such cages are substantial in design, safe, and gentle in their discharge. The car, on being thrown forward in the dumping position, has its end door caught and lifted clear of the coal, which flows forward to the hopper *A*, during which time the topman removes the loader's check.

Passing over *A*, the coal flows to the screen *B*, where it strikes a level section 3 ft. long, acting as a feeder to the egg perforations immediately following, and at which point the egg, nut and slack are separated from the lump, falling to a lower deck, which in turn discharges to the Marcus picking and screening table *D*. The lump passing the egg perforations goes next over the cobble perforations, the undersize passing through to the table *C* and the oversize to chute *L*. By unbolting the cobble screen all lump passes direct to *C*.

Screen *B* is belt-driven by a motor set in the motor house under the main floor. This houses all motors by themselves, which places the responsibility for their upkeep in the hands of one man, as no one else can get at them. Though not shown, this house should have dust-proof sides and roof and approach stairs from the ground.

On the Marcus table *C* the lump coal is picked, lip-screened, and discharged to open cars on track *E* or to box cars by means of the Manierre loader *R*. Care should be taken in the design of a tipple to avoid having to send all lip-screenings to slack cars; for if this is the only method of disposing of them, each time a slack car is changed the whole tipple will have to stop, as the loading of lump cannot go on.

On Marcus *D* the egg, nut and slack jigging forward pass immediately over a slack screen, leaving the two larger grades unobstructed and in perfect condition for picking. The slack falling through moves forward on a lower deck. At the end of the picking surface the egg and nut again pass over a lip screen, sending all chippings resulting from picking through to the slack. The egg rides forward to open or box cars on the track *H* or to the box-car loader *S*. The nut is separated from the egg just before reaching the chutes at track *G* and falls to a lower deck, thence to cars on this track, the slack having already left the lower deck at track *F*. By means of valves closing the discharge to chutes over the tracks, the nut and slack can go forward, allowing of the following combinations: Track H—Egg; egg and nut; egg, nut and slack. Track G—Nut; nut and slack.

From Marcus *D* slack, or nut and slack, can be bypassed to the boiler-room conveyor at chute *B R* or dropped direct to the bins *P*. Where nut and slack are diverted to either of these channels the slack screen on this table should be replaced with a nut screen, as it would be unnecessary to pick the nut in that case.

As few obstructions in the way of columns as possible should be allowed between the tracks, the tables and chutes are therefore carried by trusses over tracks *E F* and *G*. Elevated walkways, not shown in the drawing, should be placed between the cars at a height of 6 ft. to facilitate movements of car loaders.

The pivoted box-car chutes, falling through car doors in forward position, are carried on concrete blocks. On each of these at *F* and *G* and on the foundations of loaders at *R* and *S* should be mounted car retarders of the Fairmount Mining Machinery Co.'s design to allow of shifting open cars during loading. These are inexpensive and of decided advantage on every track.

The cover over all tracks is 24 ft. long and forms an ample rain shed for loading cars.

On lump track *E* the following combinations can be made: Lump; lump and egg (accomplished by changing the egg perforations on preliminary screen *B* to nut perforations, sending the lump and egg both to Marcus *C*); lump, egg and nut (accomplished by a plow on Marcus *D*, which discharges the egg and nut to the transfer conveyor *I*, in turn feeding Marcus *C*); lump, egg, nut and slack (same process).

All Motors Are Duplicates

The two Marcus tables are driven by a duplicate of the motor employed to drive the screen *B* placed in the same room with the other motor. Both the tables *C* and *D* and screen *B* are controlled from the picking room, so that all machinery can be stopped for very dirty coal, changing of cars or accidents.

Waste from the tables is dropped through spouts to the bins *P*, placed directly under the picking-room floor. From these it is discharged through roller-bearing slide gates to cable cars Q of the hinged side-door type. These cars are hoisted to the waste pile by means of a two-drum electric hoist set next to the box-car loader *R* and handled by its operator during lulls. The cars are dumped on the pile automatically, the entire outfit being furnished by the R. W. Hunt Co. or the John A. Mead Co.

One drum of the hoist is used for cars *Q* and one is so led that it can be used for handling railway cars about the tipple. During cold weather trouble is often experienced moving cars, and at all seasons the yardmen are apt to drop a car too far below the tipple and it must be brought back. This is a hard job with an old stiff car, but all this work is accomplished by the extra drum.

The waste bins *P* should be of the Berquist suspension type, self-emptying, easily repainted and repaired. The cars *Q* and the track upon which they run should be installed as soon as the tipple stakes have been driven, after which all yardage from shaft sinking, foundations, ditching and ground leveling can be sent to the waste pile, which will be used for all time. If this is done, the plant site will not be littered by waste piles occurring here and there merely because the designer failed to consider this question in the first place. In fact temporary extensions to this track can handle all dirt from the rest of the plant units and townsite excavations. Three all-steel cars should be furnished complete with hoist and ropes, as well as trackage.

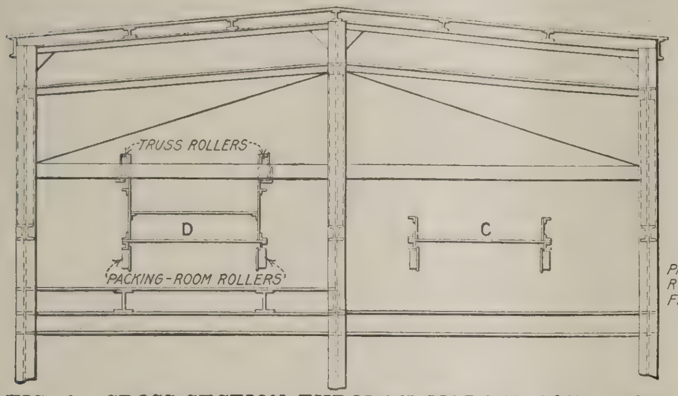


FIG. 6. CROSS-SECTION THROUGH MARCUS CONVEYORS

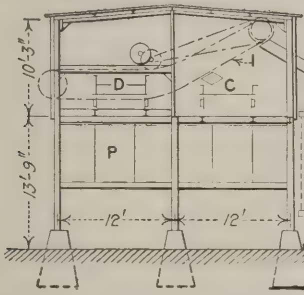


FIG. 7. SECTION THROUGH PICKING ROOM

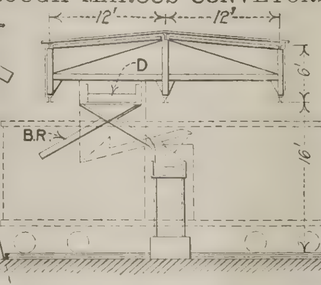


FIG. 8. LOADING CHUTES FOR SLACK AND NUT

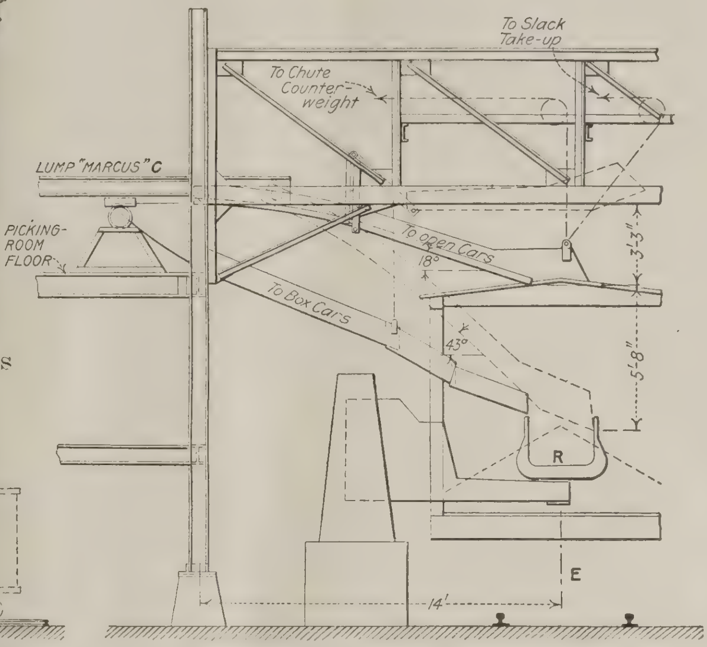


FIG. 9. ARRANGEMENT OF CHUTES AND BOX-CAR LOADER

Lump for cracking passes over the Marcus *C* to the chute *L*, thence to the cracker *M*. The Whitaker coal breaker, manufactured by the Hardy Patent Pick Co., of Sheffield, England, is shown herewith and is the most suitable known to the writer.

Briefly, the breaker consists of a series of mechanically worked picks acting on the coal traveling on a short steel belt conveyor, the action being precisely that of hand breaking with mechanical regularity. The unit is driven by a 10-hp. motor and has a capacity of 200 tons per hour.

From the breaker *M* the cracked lump flows to the boot of the elevator *N*, which in turn discharges through the chute *O* to the head of the screen *B*. This elevator should consist of steel buckets 30 in. long, carried on two strands of steel-thimble roller chain, and should be wholly incased in a housing of $\frac{3}{16}$-in. steel. This elevator is driven through a chain from the eccentric shaft of screen *B*. Local coal is obtained by opening the valve *A'* in the receiving hopper *A*, and thence by means of a deflecting valve operated by the topman sent to the local coal bin *K*, so set that its wagon feed valve is well away from the tipple. By throwing the deflecting valve previously mentioned rock can be spouted by chute *J* to the inside waste bin *P*, extended and roofed to care for this storage. The transfer conveyor *I* not only feeds table *C* but by means of it any of the small sizes may be sent to any of the auxiliary units desired.

The loading chute illustrated in Fig. 9 is of ¼ in. steel and is made up of two sections fastened together by a sword hinge. This hinge is bolted shut with wing-nut bolts as long as the chute is used for open cars. When box cars are loaded the hinge is unbolted and the lower section of the chute pulled up to the clearance line as shown. The rear end of the chute is supported by rollers.

In addition to the features already considered, arrangements should be such that prior to a shutdown coal can be sent to an auxiliary outside storage in sufficient quantities to care for the boilers and meet local demand during that time. This can best be done by deflecting coal over the rock chute to the waste bin *P*, thence by car *Q* to a pile separate from the main waste storage.

From the industrial waste tracks for cars *Q* a spur should be led at right angles to all railroad tracks and across them, so that car *Q* may be pushed over and loaded with spillage and other dirt between or on the tracks.

The following enameled signs should also be part of the tipple equipment: Instructions for signaling cages at every landing, "no smoking" signs at the foot of each stairway, blackboard at main landing for temporary notices. A check board for mine-car checks and an employees' register board should both be placed at the topman's office if upper landing is used; if the lower landing is employed, the register board should be at the lamp room.

Analysis of the Coal-Car Situation

Compiled by A. T. Shurick

SYNOPSIS—Conforming with its usual custom at this period of the year, "Coal Age" presents herewith official comments from the leading coal roads as to the outlook for the coal-car supply during the coming fall and winter. The carriers are generally confident of their ability to handle the business as regards their respective lines, though it seems probable that for a period there will be a shortage in equipment.

American Railway Association

By Arthur Hale, General Agent

The surplus of coal and gondola cars reported by the American Railway Association for Sept. 1, 1915, was nearly 41,000. This is not far from last year's figure for the same date, which was 46,000, but the shortage of coal cars this year is over 2,300, while last year it was only 66. There was no large surplus of coal and gondola cars prior to 1914 until we get to 1909. There we find on Aug. 18 a surplus of about 42,000. In 1908 the surpluses were much larger until the middle of October. It is of course difficult to judge from these figures what the situation in coal cars will be in October and November, but in 1909 there was quite a marked shortage, which ran up to nearly 12,000 cars in the middle of November.

There is one point in which the record this year is similar to that of 1909; that is, the surplus decreased very rapidly in August, while in 1914 it came down very slowly. This would seem to point to the possibility of some little coal car shortage in the months of October and November of this year.

On the other hand, the drop this year seems to be about two weeks later than it was in 1909. Here again it is difficult to compare, because this year we have figures only for the first of the months, while in 1909 we had them for the middle of the months as well.

If we can judge this year's showing by that of 1909, there will be a shortage of perhaps 8,000 or 10,000 coal cars on Nov. 1, 1915.

Chesapeake & Ohio Ry. Co.

By E. W. Grice, Assistant to President

This company is making an extraordinary effort to get its freight-car equipment in good condition for the fall and winter business, and expects to have its bad order list as low as practicable in numbers. This is also true of the locomotive equipment. Twenty-four Mallet locomotives have been purchased and are now coming on the road, and will be available for the autumn business. Several thousand box and coal cars are being rebuilt at outside shops, and we apprehend no difficulty in providing equipment for the business that will be offered. Additional yard and side-track facilities are also being provided. The new coal pier is working admirably, and is handling the business satisfactorily.

Western Maryland Ry.

By S. Ennes, General Manager

We have contracted with the Lima Locomotive Works for 15 of the largest Mallet engines ever turned out for road service, which we feel will give us power to handle promptly a large increase in tonnage. Our car supply has been good for the last 18 months, but in anticipation of increased business we have plans about ready for a 70-ton coal car and expect to ask for bids in the near future. Our track conditions are good, and we are making additions and improvements in our yards, so that I feel safe in assuring you as a representative of the coal industry, that we will be able to take care of our patrons in good shape.

Virginian Ry.

By S. M. Adsit, General Freight and Passenger Agent

There is nothing of special importance to report in regard to the car supply on the Virginian Ry. For the past 12 months the supply has been more than adequate and it will require a greatly increased tonnage to change this condition adversely.

Louisville & Nashville R.R.

By G. E. Evans, Fourth Vice-President

As conditions relating to the coal-car supply upon our lines are very much affected by the general situation throughout the country, because the coal markets are to a large extent beyond our rails, we hesitate to express an opinion.

Hocking Valley Ry.

By M. J. Caples, Vice-President

There is no question but that the Hocking Valley will be able to provide a full car supply for all the mines on its line during the coming year. At the present time (Sept. 7) we have 3,500 coal cars stored on the line because there is not sufficient business to make use of them. At times during the current year this surplus of cars has been as high as 8,000, and it would be still greater but for the fact that we have sent these cars to other roads for loading.

Toledo & Ohio Central Ry. and Kanawha & Michigan Ry

By F. B. Sheldon, Vice-President

We are not anticipating any shortage of equipment. Since the publication of your analysis of the coal-car situation one year ago the Toledo & Ohio Central Ry. has added seven heavy consolidation freight locomotives to its motive power and 2,500 steel coal cars of 50 tons capacity. This means an increase of 40 per cent. in the capacity of its coal-car equipment, which now amounts to 8,500 cars.

The Kanawha & Michigan Ry. has 6,000 coal cars. On Oct. 1, 1914, the Toledo & Ohio Central Ry. became the owner of the Kanawha & Michigan Ry. by the acquisition of practically all of its capital stock. Owing to the extreme depression of the coal industry the two lines have had for nearly a year past a very large surplus of idle coal cars, and with the revival of business, which has already set in, there is no likelihood of any shortage on our lines.

Our motive power is in good condition and ready to handle without delay all traffic that may be offered to us at any time.

New York Central Lines

By F. E. Herriman, Coal Traffic Manager

The New York Central Lines are hopeful that there will be no difficulty in taking complete and proper care of the fuel traffic this fall and winter. As to motive power, increased yard facilities, etc., it is our belief that everything possible has been or is being done to maintain, and perhaps increase, the capacity of the system for handling coal tonnage.

By A. T. Hardin, Vice-President

The present returns appear to indicate some improvement in the situation. However, this company has a surplus of 13,000 cars in excess of present (Sept. 3) demands, and hopes to be able to meet all demand for increased traffic.

Buffalo, Rochester & Pittsburgh Ry.

By E. A. Niel, Coal Freight Agent

The policy of our company has been to maintain the the car supply on such a basis as to fully meet the requirements of our coal shippers, and we have generally provided for such equipment a little in advance of their actual demands; that is to say, we have anticipated the needs of our coal shippers and made the necessary arrangements for additional coal-car equipment, with a view of at all times furnishing 100 per cent. of the cars needed at the mines along our line. For several years past we have had no car shortages.

We have increased our motive power by the purchase of a large number of the heavier locomotives of modern type, thus preventing delays in shipments and thereby increasing the efficiency of the cars themselves. In addition to improvements in rolling stock and motive power, we are continually improving and strengthening our roadbed and eliminating curvature wherever economies can be effected, so that at the present time we are better prepared than ever before to handle increased coal tonnage in the most satisfactory manner.

The indications point to a materially increased demand for coal and a corresponding demand for cars, which will doubtless tax the ability of all lines in this section.

Delaware & Hudson Co.

By C. S. Sims, Second Vice-President and General Manager

During the past year this company, in conjunction with the Pennsylvania R.R., has finished the construction of the Wilkes-Barre Connecting R.R., uniting the rails of the Delaware & Hudson with those of the Pennsylvania through the city of Wilkes-Barre. This does away with the congestion and delay formerly encountered in passing through the city limits and adds enormously to the traffic possibilities, probably bringing about a decrease in the average time requirement of at least half a day. We are also building just south of Carbondale a modern plant for the storage of anthracite coal.

Central R.R. Co. of New Jersey

By W. G. Besler, President and General Manager

So far as the Central R.R. of New Jersey is concerned, there is nothing of unusual interest to report. We have kept our property and rolling equipment right up to their usual high standard. We have worked our shops full time and augmented the forces by several hundred men, so as to have our equipment in an A1 condition to provide for a possible increase in business. We expect for the future, as we have in the past, to be able to take care of all of our patrons.

Philadelphia & Reading Ry.

By A. T. Dice, Vice-President and General Manager

I can only say that the experience of this company has been for a number of years past that we have always been able to provide a full supply of coal cars for shippers on our line, and I see no reason why we shall not be able to do the same during the coming winter.

Delaware, Lackawanna & Western R.R.

By E. E. Loomis, Vice-President

We hope and expect to fill all demands for cars to load with coal on our line during the coming year.

Extracts from a Superintendent's Diary

I received a letter from the general manager of our company today in which he requested me to give his oldest son a position at our camp in any capacity that I might decide would be best for the young man. He is 23 and has just graduated from the Columbia School of Mines in mining engineering.

At first I felt very much puffed up by the compliment, for such it surely was, because the general manager had the pick of twelve superintendents. Just why he should have chosen me I of course could not tell, but the fact that he is willing to have the boy lay the foundation for his career under my guidance is pleasing to say the least.

After looking at the matter from all angles, however, I am sorry that I cannot thank the general manager for the compliment and then pass the responsibility on to one of the other superintendents.

It goes without saying that the general manager does not expect his son to remain in one position long; he wouldn't be a normal general manager if he did. What he desires is that the boy be given a chance to familiarize himself with everything in connection with the operation of a coal mine, as no doubt he intends to put the son in charge of an operation as soon as he acquires the necessary confidence and experience. All of which is very desirable and possible from his standpoint, but very difficult from mine.

Assuming that the boy is all that he ought to be (which he probably is not) and that he will be very anxious to make the most of his opportunities (which he also probably will not), there is still the possibility of engendering much hard feeling all along the route that he will travel. It is so natural for men who have had to hold on to minor positions longer than they consider necessary (and most men in minor positions come in that classification) to assume that advancement can only be obtained through a "pull" that, if they have an opportunity of seeing this favored son pass merrily along from bottom to top without noticeable effort, they will be more than apt to become discouraged if not embittered.

In the one case the rapid rise to power furnishes an example that thrills all who have been thrown in contact with the fortunate one, and here and there some discouraged struggler even takes a new grip on life; but the rise of the manager's son would have no such bracing effect.

I am unable to get enthused over the fact that I may have the opportunity to assist in this matter. Possibly the realization of the fact that some day he will outrank every one in our camp, myself included, may have something to do with my feelings in the matter, but I wouldn't admit in public that any such ulterior ends could sway me.

The Labor Situation

SYNOPSIS—The tradespeople in the anthracite region are anxious to remove the menace of a strike and want a speedy convening of operators and miners. The right of miners to unionize outside the U. M. W. of A. is being tested in West Virginia. Attorneys for the miners in Colorado are charged with subornation of perjury. J. D. Rockefeller, Jr., visits his Colorado miners.

The tridistrict convention has met and adjourned. The demands of the miners though intended to be fair are nevertheless unreasonable. The papers of the anthracite region assure us that they are no more extravagant than has been customary, and so perhaps it would be safe to assume that the usual trade discount can be applied to them and that the miners will not adhere rigidly to their circular.

It will behoove the operators to go carefully over the ground and make up their minds as to the rights of the situation and declare what these are. If the cost of living has advanced, the miners are entitled to an increased wage, and this is still true even if it be proved that some of the operating companies are not able to make fair returns under the present scale. The public can, must and should pay this increase, and the operators should give the consumers a clear understanding of what new price must be established to restore the status quo.

A Public Which Does Not Know Cannot Be Censured

The people should not be asked to pay any more than will indemnify the companies for the increased cost of production resulting from a larger wage and workmen's compensation. The consumer does not know just why the larger wage must be principally placed on the domestic sizes, especially if the bituminous operators do not concede an equal rise in wages. He does not know that because he demands the cream of the coal he must shoulder the bulk of the burden. He does not understand these things because he has never been told. Only a "divine right" utterance has been given him upon which he has placed a somewhat unfair interpretation. He is accordingly not to blame, because a lack of knowledge of facts is not like an ignorance of the law. It excuses the newspapers in publishing and the public in accepting a large amount of misinformation.

A careful and accurate statement should be prepared, quite unlike one which has just been received, which, by the way, was not issued by the anthracite operators. It says, speaking about the Scranton wage demands: "The employee intends to take the position of dictator, while the employer will be expected to take a humble seat." This plaint will not appeal to the democracy. The successful advocate of the operators' rights must make no reference to the question as to who is running the mines—the operators or the men they employ.

The statement which will convince will show that profits are necessary, that the old scale was declared by a commission to be reasonable, that the changes are or are not justified by an increase in the cost of living and that advances in price are warranted by increases in cost. The public is not disposed to believe that property has any rights to profit and increment except through service and does not care who is in the saddle so long as the ends of good government are sustained. The mine operator is performing a service; his profits, if in reason, promote the public good. He is, in seeking his self-interest, striving after economical production which serves equally the public advantage. The dictator and the servant are one, and neither party has a right to say, "We demand," as do the miners, without fortifying his position with argument. Once deny the duties of the operator and you surrender your right to hector the working man for his lapses in civic virtue and common sense.

Wilkes-Barre Dreads a Delay in the Wage Decision

The trades people in the anthracite region, especially in Wilkes-Barre, are rebelling against the delay in negotiations. They feel that the convention at Scranton, the canvass for membership and the tridistrict meeting in Wilkes-Barre have created such a strong feeling of apprehension that business is sure to suffer. The miners also will hoard in anticipation of a strike and all trade, based on their needs, will be bad.

The Chamber of Commerce in Wilkes-Barre wants the miners and operators to meet before the Indianapolis convention has commenced its sessions, not after. This meeting begins on Jan. 17 and will probably remain in session until Feb. 5. For some time after that the merchants will be in suspense, and if a settlement is not secured in seven weeks the strike may be called.

The business men fear they may experience five lean months followed by several weeks of actual idleness. The enforced economies, however, if not followed by a strike will be of great advantage to everyone. There is a strong tendency for the wage earner to live up to the last cent of his income, and just before a strike the workingman learns what it means to receive money and put it by for a rainy day.

Mr. White hopes that he will have 123,000 men in the union when he meets the operators. Last month there was a paid-up membership of 63,108; but in addition it is said that there were enough members who were exonerated from paying dues from lack of work to bring the number up to 100,000.

Another Injunction Is Brought by a Mine Worker

Thomas Holton, of Local 996, has begun an action in equity against Peter O'Donnell, enjoining him from acting as a member of the executive board of District No. 1 of the United Mine Workers of America. O'Donnell received 6,937 votes and Holton only 5,842, but Holton claims 6,903 and declares that O'Donnell should have only 5,031. The matter was well aired at the convention of District No. 1, and Holton's contentions are given in some detail in "Coal Age" of July 31, p. 175.

John Dempsey and John M. Mack, president and secretary respectively of District No. 1, and Richard Roberts, Martin Battle and Casimir Shemanski, the tellers, are made codefendents with Peter O'Donnell. This is the third injunction by mine workers in the last few weeks. It is evident that the union men are seeking to use the court of equity as generously as the operators. Now that they are using it they may find less popular opposition to the injunction. It may be predicted that when they have employed it for a while new virtues in its application will forthwith appear.

Ohio Is Trying to Find a Place in the Sun

The Sunday Creek Co. is furnishing the miners of the Hocking district with a statement of the position of the operators on the wage scale signed more than a year ago. The company has sent out thousands of copies of the wage agreement without any comment. But the sections which are supposed to have been violated by the subsequent action of the officials in signing up eastern Ohio are printed in italics. The company hopes that by going over the heads of the officials of the miners' organization it will get the issue fairly before its men. It is expected that other literature will be sent out later.

As was to be expected, the operators in West Virginia have shown much concern about the proposed increased freight rates in that state and they intend to oppose the application of the Interstate Commerce Commission when it is made. The Kanawha Coal Shippers' Association, the Splint and Gas Coal Association of West Virginia and the Central West Virginia Coal Operators' Association have all meet to discuss the change. At the meeting of the latter, which was at Fairmont, W. Va., 95 per cent. of the productive capacity of the Fairmont-Clarksburg district was represented.

There seems to be a fear that rates will not only be raised in West Virginia but also lowered in Ohio. The operators wonder that coal-freight roads which have done so well on the rates established should ruin, as they express it, both the state and themselves by raising freight rates.

The West Virginia people have shown little concern about their progressive ruination of other states and they cannot expect Ohio to show the virtues of consideration. It is true that a readjustment which would permanently injure West Virginia and make its production go backward would be inadvisable if not unjust. But it is much to be doubted if 15c. per ton would have so large an effect, for the state has had unquestionable advantages over its neighbors as shown by the progress in output and the number of new operations.

Disputes Still Unsettled in Eastern Ohio

The miners and operators in the eastern Ohio district formed some time ago a joint committee, composed of Fred Ledvinka (representing C. J. Albasin), William Roy and Frank Woody for the miners and J. R. Roby, W. Osborne and Franklin Neff for the operators. They have been discussing the removing of rock, "pick-outs," the setting of timber and the cutting of room necks by machine men. They held a two-day session and on Sept. 15 adjourned without agreement.

An arbitration committee will be formed, with C. J. Albasin of Bridgeport representing the miners, the commissioner of the Pittsburgh Vein Operators' Association representing the employers and Thomas Wangler of Columbus, Ohio, as a third and neutral party. No commissioner has as yet been appointed by the P. V. O. A. in place of John Zalenka, recently deceased.

Boomer Coal and Coke Co. Forbidden to Pay Checkoff

On Sept. 13 about 1,000 miners employed by the Boomer Coal and Coke Co., at Boomer, W. Va., went on strike in order to bring pressure on the company not to yield to the officers of District No. 17 of the United Mine Workers of America. They feared the company would pay the checkoff to these men instead of giving the money they had collected to the officials whom the miners preferred.

West Virginia is in District No. 17, but recently a new division has been created by seceding unionists, which they term District No. 30. The company was about to pay the union dues to the officials of this newly erected district when the union asked for an injunction. The men who struck on Sept. 13 returned to work, the company urging that the issue was not theirs but the court's. The seceders have been fighting practically for the right of labor to sail under any flag it pleases, and the union has been endeavoring to compel the miners to remain within the fold whether they like it or not.

On Sept. 14 Judge H. D. Rummell refused to dissolve the injunction restraining the Boomer Coal and Coke Co. from paying money to the officials of District No. 30. So it appears that the corporation will hold the money in escrow for a further period.

Union Seeks Injunction Against Unionizing and Striking

It was also interesting to notice that the union asked for a rule against officials and others connected with District No. 30, charging them with endeavoring to cause a strike of miners working for the Boomer Coal and Coke Co. and bringing about a practical shutdown. But so far this petition has not been acted on. The rule would be as drastic as the most obnoxious of those granted in the past to operators against the unionizing of employees.

It is much more severe than the rule made by Judge Alston G. Dayton, which has been denounced from coast to coast and which is still creating trouble, though dating back to 1913. The miners have tried to have Judge Dayton removed for granting this injunction. Attorney Frank O'Brien, as special commissioner for Judge Dayton, is hearing evidence in the case of the West Virginia-Pittsburgh Coal Co. against Van Bittner, the president of the union in the Pittsburgh district, and others.

When the strike occurred in 1913 Fannie Sellers, James Oates and others were arrested and imprisoned on charges of using violence in forcing the miners to leave their work. The supreme court of Richmond overruled the decision of Judge Dayton, and the company is now asking for a permanent injunction to restrain the organization of the Brooke County field. The defense is endeavoring to show that there was no violence in the coercion used and pleads that an injunction is not needed, as there is now no intention to attempt any coercion.

The officials of District No. 14 seem to be making an attempt to secure a rule in central West Virginia which they openly declare the height of inequity in the Panhandle of the same state. It is to be observed that there is no coercion at Boomer. The men want to go into the new union, want to pay the checkoff to it and want to strike without hindrance from the old organization; and the union denies the miners the liberty, arguing probably that it has a contract with the operators making provision for its recognition, providing for the checkoff and forbidding strikes. But never so long as the union was undivided did it ever seek to restrain its men from striking by a resort to the injunction. Now it claims it has contracts which a strike will make it impossible to fill and pleads that the miners it is seeking to restrain will ruin its standing if allowed to conspire. The argument of the early operators is now being urged by the union as a reason for enjoining the miners who wish to form a rival body of their own.

Kansas, Indiana and Colorado Notes

The miners of the Sheridan Coal Co. in Kansas have won their strike and have returned to work. The right of workmen under the contract to be supplied with places at one mine when the mine of an affiliated company has been closed down was established. About 1,000 men were involved in the strike.

At the mine of the Deep Fourth Vein Coal Co., just west of Terre Haute, two blacksmiths were discharged. After five days of arbitration, all the employees went on strike. Horace N. Hawkins, general counsel for the United Mine Workers of America, and Fred W. Clark, local counsel, have been charged with subornation of perjury, the information being filed by Attorney-General Fred Farrar. Grover Hall, a juror in the murder trial of John R. Lawson, made an affidavit that he stood out for an acquittal of Lawson, but finally agreed to a verdict of guilty as a result of coercive measures employed by Frank Gooden, a court bailiff. In that affidavit he stated that Gooden had told him that his (Hall's) wife was seriously ill. He also swore that Gooden later informed him that Judge Granby Hillyer had ordered the jurors locked up without food till they were ready to agree to a verdict.

This affidavit was used by Hawkins and Clark when applying for a new trial for Lawson and also in connection with a petition whereby a supersedeas was secured from the Supreme Court. Hall has made another affidavit, stating that he was bribed to make his previous statement.

As was anticipated in last week's "Coal Age," R. W. Coates, a detective employed by the United Mine Workers of America, was arrested on a body attachment issued by the military court of inquiry investigating charges against National Guard officials. His attorney, C. E. Friend, started on a motorcycle to the West Side court in Denver for a writ of habeas corpus.

John D. Rockefeller, Jr., Visits Mines in Colorado

John D. Rockefeller, Jr., is making an inspection of the coal mines in Colorado in accordance with his promise to Mother Jones on the occasion of the sitting of the Industrial Relations Commission in New York City, Jan. 27. He made his appearance quite unexpectedly Sept. 20. He will spend at least two weeks in the state and make a thorough investigation of working conditons.

There has been some talk that the officials of the United Mine Workers will take advantage of Rockefeller's visit to arrest him for his alleged responsibility for the Ludlow battle, and that President J. F. Welborn of the Colorado Fuel and Iron Co., President David W. Brown of the Rocky Mountain Fuel Co. and President John C. Osgood of the Victor-American Fuel Co. would also be placed under arrest.

In fact it was stated by President John McLennan of the Colorado district that A. M. Belcher, chief counsel of the United Mine Workers of America, would arrive in Colorado Sept. 21, having such arrests as the main purpose of his visit. The miners, according to William Diamond, purposed to lay the information before Attorney-General Farrar not later than Sept. 22. If this failed the public was to be informed as to the evidence submitted, so that it could judge of the justice of the miners in demanding that action be taken. However, at present writing none of the actions threatened have been put in operation.

John D. Rockefeller, Jr., on Sept. 20 visited the scene of the Ludlow battle and the villages Berwind and Tabasco. He talked with the miners and interviewed their wives about working and living conditions. He also made suggestions for improvements.

At noon he lunched at the miners' boarding house with Tom Davis, the superintendent of the mine, who was clad in his blue overalls. In the afternoon he visited the Tabasco school and the improvement work done to employ idle miners. A steep hillside had been graded to make a playground. Mr. Rockefeller addressed the scholars and later visited more houses and had a long talk with Dan Morelli, a coal digger who has been elected to represent the miners of Berwind in conferences with the officials of the fuel company.

On the following day Mr. Rockefeller visited Segundo and Frederick and the "stone-wall" road recently erected with Rockefeller Foundation funds. In the afternoon he went in the mines and dug some coal, meeting Archie Dennison, the head of the grievance committee of the Frederick mine at Valdez. Dennison assured the visitor that the meetings of the committee with the higher officials had removed many causes of complaint with minor officers of the company. On Sept. 22, the Sopris School was visited, where one of the children gave Rockefeller a course in banking and finance.

There is a rumor that James J. Hill is about to purchase the Rockefeller holdings in the Colorado Fuel and Iron Co. The visit of Mr. Rockefeller to the mine and the denial of the New York office seem to discredit this report effectually.

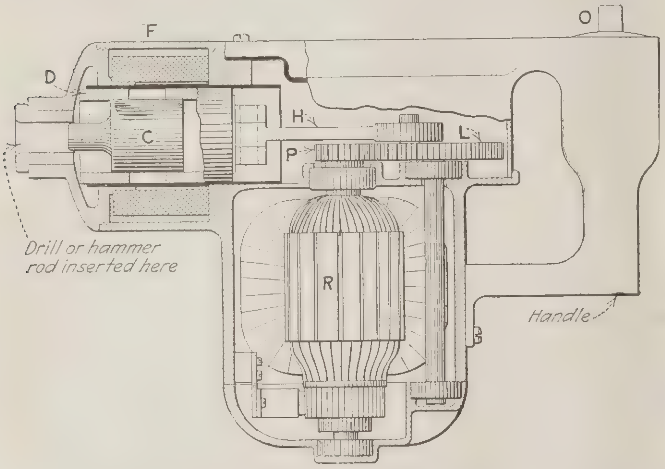
About 3,500 miners from two collieries in the Cardiff district, South Wales, recently went on strike because nonunion men were being employed in the mines. They took this action despite the fact that the nation was suffering for lack of coal and had declared an embargo on all foreign shipments, not allowing coal to be shipped even to allies. Their action is so reprehensible that the strike is not likely to spread.

New Apparatus and Equipment

New Electric Hammer Drill

The Western Electric Co. has recently placed on the market a line of electric hammer drills that may be operated at small cost from any convenient light-socket. A man equipped with one of these drills may be expected to do six times as much work as could be done by hand, while in some classes of work even greater speed can be attained. A man with a hammer or small sledge strikes from 50 to 80 blows per minute, while the electric drill strikes from 1,400 to 4,000.

The principle upon which this hammer works is as simple as it is effective. The main parts of the machine are the motor, a drill or hammer, and the magnetic clutch plunger. The motor *R* in the accompanying drawing transmits motion through the hardened gears *P* and *L*, and the connecting-rod *H*, to the cylindrical sleeve *D*, which has two relatively thick end sections with a thin center section connecting them. This center section is as thin as is consistent with mechanical strength.



CROSS-SECTION OF THE DRILL SHOWING THE ARRANGEMENT OF PARTS

The plunger *C*, which delivers the blow to the drill, lies loosely within this cylinder and is not mechanically connected to it or to any other part of the mechanism. Outside of the sleeve is placed the magnet coil *F*. This coil is stationary, the sleeve moving backward and forward within it. The coil is in series with the motor, and the current traversing it is always steady and in the same direction.

As soon as the circuit is switched on (by the button *O* conveniently arranged on the handle) a magnetic circuit is created with the thick sections of the sleeve as the poles and the plunger as the armature. As the sleeve is oscillated back and forth by the motor, the effect is that of moving the polepieces of the magnet back and forth, and the plunger clutched across the poles moves similarly, transferring its energy to the drill when the two parts come in contact, which takes place near the end of the stroke. The plunger is slightly longer than the thin section of the sleeve, which gives it a certain amount of overtravel and an elasticity of connection that entirely remove the stress and jar of the blow from the machine.

The motor is series-wound and the gears are of oil-hardened special gear steel, while ball bearings are employed throughout.

A number of these drills have for some time been in successful use in coal mines, where they have been employed not only for taking down top and lifting bottom, but also for drilling the coal face preparatory to shooting.

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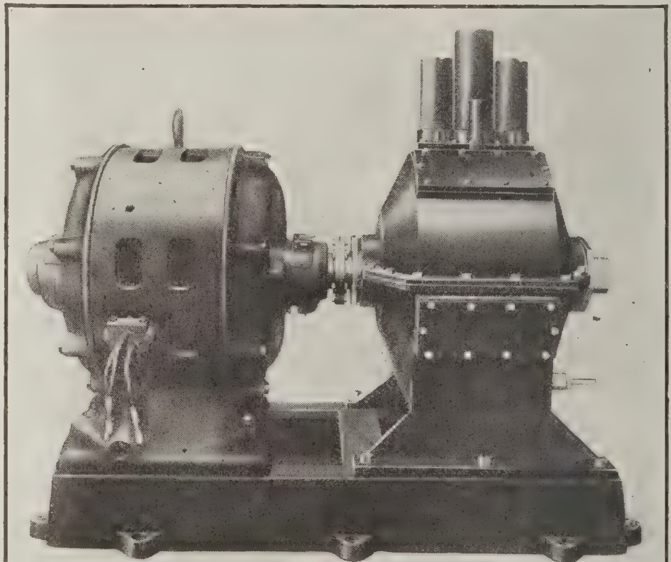
Jackson Rotary Air Compressor

A new type of rotary compressor, the invention of H. O. Jackson, is being perfected by the Jackson Compressor Co., 1130 Twelfth St., Denver, Colo. As yet the machine has been built only in relatively small sizes, and the company is taking no commercial orders.

As shown in the accompanying photograph, this compressor is small and compact. One unit, which has just been completed and mounted on an ordinary automobile truck especially equipped with a silent chain-drive from the engine shaft for purposes of demonstration, has interior cylinder dimensions of 7½x8¼ in. The weight of the machine, without motor, is 345 lb. Running at 1,000 r.p.m. this machine compresses 180 cu.ft. of free air per minute to 100-lb. gage-pressure in a single stage.



JACKSON COMPRESSOR DIRECT CONNECTED TO A MOTOR

Within the cylinder five wings or blades move with an opening and closing motion from an eccentric on the single central shaft. The space between these blades is thus opened allowing the admission of free air and then closed, compressing and expelling it. The volume of each compartment when at its maximum is more than ⅕ of the volume of the entire cylinder, so that each revolution of the shaft with the accompanying five compressions handles considerably more free air than the normal capacity of the cylinder.

This machine is quite silent in operation. It requires no foundation, and there are no packed joints, all contact surfaces being ground to a tight metallic fit. Since the intake and expulsion of air is continuous, no pulsations are perceptible in either the suction or exhaust. The machine is highly portable and has been experimentally operated while hanging freely in the air suspended by an ordinary rope.

The two outer pipes shown in the illustration admit free air to two manifolds encircling the cylinder, permitting the entrance of air to each of the five compartments through poppet valves. The middle pipe shown is the discharge line. It also connects with each of the five compartments through a manifold and valves. All three of the above-mentioned manifolds are within the water-jacket space surrounding the cylinder.

Lubrication is provided through a drilled hole in the shaft. Oil of a high flashpoint is admitted from an air-pressure reservoir attached to the right-hand side below the shaft. Excess oil collects and passes through the exhaust manifold with the compressed air into a small pipe shown in the illustration and thus back to the reservoir. The oil in the reservoir being under pressure resumes its circuit again, regulation of the amount being effected by a simple valve in the feed line. The lubrication is thus continuous.

This compressor will run successfully in either direction of rotation, but it is designed to operate preferably in one direction only. It may be operated with equal efficiency as either a compressor or an exhauster. Experiments with the machine in the latter service have shown that it will maintain a vacuum of 22⅝ in. of mercury at Denver, which is a good showing considering the altitude.

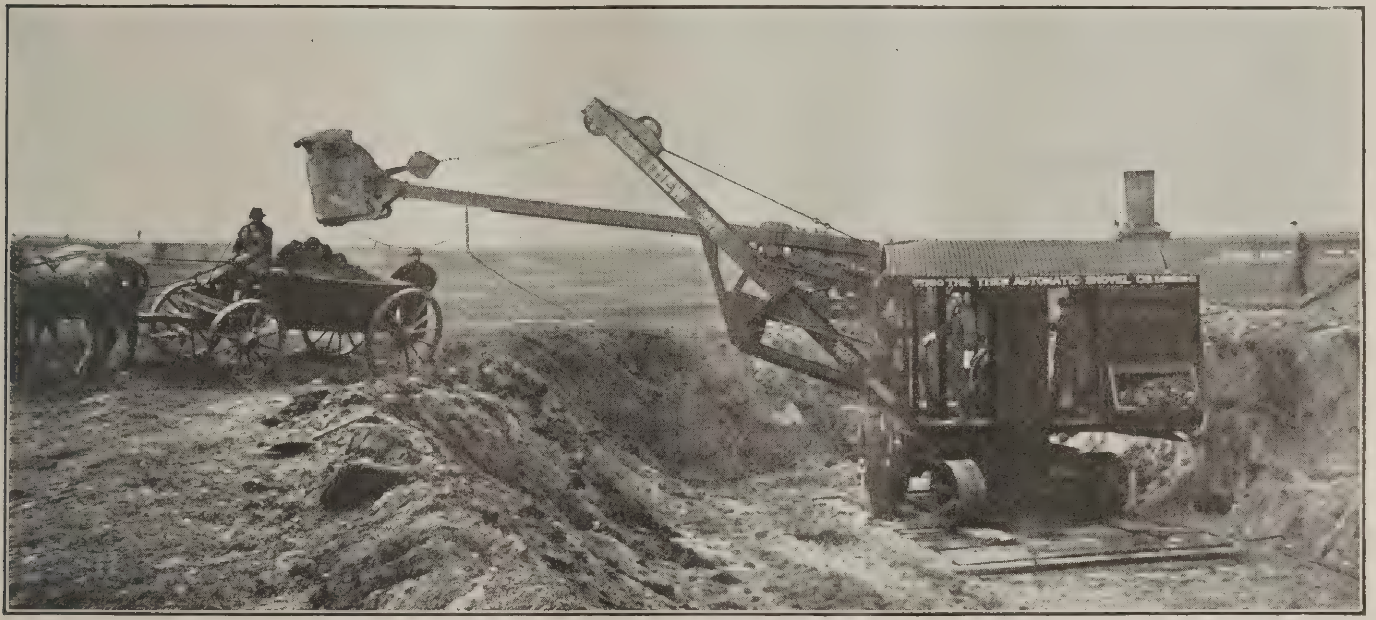
The manufacturers of this machine state that the compressors will weigh approximately one-tenth what piston-displacement machines of corresponding capacities weigh. The strong points claimed for these machines are their lightness, portability and simplicity.

Combination Boom Shovel

A new type of steam shovel, known as the Thew combination boom machine, has recently been placed on the market by the Thew Automatic Shovel Co., of Lorain, Ohio.

In it the Thew horizontal crowding motion is combined with a shipper-shaft mechanism of new design. Thus are secured the advantages of the horizontal crowd for shallow cuts, together with a jackshaft crowding motion which is highly advantageous in deep work and digging trenches or where extended dumping radius or high clearance lift is desirable.

The two crowding mechanisms are independent and noninterfering. Both are operated from the same crowding engine which is merely changed in position. When using the horizontal crowd, the long dipper handle must be removed, and when the shipper-shaft crowd is in use, the short dipper arm is chained to the boom structure after removing the dipper. All changes necessary can be made in less than three hours, while the same dipper may be used with either crowding mechanism.



COMBINATION SHOVEL WITH LONG BOOM AFFORDING LARGE DUMPING RADIUS

The long dipper handle used in connection with the jackshaft crowding mechanism combines lightness and strength. It is made of a single piece of wood, 8 in. square, armored with steel plate and equipped on the under side with a steel rack. Dipper arms may be procured in numerous lengths to suit the requirements of different kinds of work, depending on the depth which is to be excavated, the extent of dumping radius or height of clearance lift desired. A dipper with a 27-ft. stick can dig a trench to 16 ft. below the ground on which the shovel stands, while a dipper handle of this size makes it possible to dump material within a radius of 31 ft., with a clearance of 14 ft.

This combination boom shovel will handle practically any class of work encountered. Either kind of crowding motion may be incorporated when the machine is purchased, the other mechanism being procured and added at a later date as occasion may require. A number of these machines have been in use for several months.

Editorials

Many Mining Machines Are Patented

Of 22 patents pertaining directly or indirectly to the coal-producing industry granted by the Patent Office in the period between July 27 and Aug. 27, no less than five were for mining machines, while nine were for mechanical stokers, pulverized-coal burners, smoke consumers and like appliances.

It might be inferred from the foregoing that those interested in coal production and consumption were lazy and wished to avoid so far as possible the manual labor of mining and burning coal. While we might agree with the latter proposition, we must take strong exception to the former. Man-power is about the most expensive energy purchasable. We pay a laborer, say, \$2 for 9 hr. work. This man is capable of exerting continuously about one-eighth of a horsepower. In other words, we have secured 1⅛ hp.-hr. for \$2, or we pay about \$1.78 for man-power per horsepower-hour.

In marked contrast to this high cost of energy is the cost of current delivered to the motor of a mining machine which should not exceed 2 to 2½c. per horsepower-hour.

It is the realization of this discrepancy between the cost of power developed by man and that developed by a steam engine, for instance, that is driving the coal industry, as well as all others, to employ machinery wherever such employment is possible. Furthermore, it is frequently the case—as in undercutting, for example—that the machine does the work better; that is, it cuts deeper and affords less resultant fine coal than when mining is done by hand.

It is probable that most operations that may be performed by machinery require a greater expenditure of power than would the same operations performed by hand; nevertheless it has become almost axiomatic that it is economical to supplant manual power by machinery wherever possible. Consequently inventors are continually striving to perfect mining machines, stokers and other power-driven devices that will do away with the employment of muscular energy.

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"A Hole in the Ground and a Hencoop Over It"

It is said that this pleasantry is still a common description by anthracite men of a bituminous mine, and it is true that there are many mine openings in the soft-coal regions which it does not much belie. It is these small concerns which play havoc with the industry, not so much because they produce much coal, nor because in any large degree they undersell the market in feeble attempts to keep in business, nor because they often fail to pay union wages, but because they form a sort of apprenticeship to the coal broker who desires to enter the operating end of the profession.

Any business which appears difficult and seems to require special knowledge is by that fact protected from general competition. Everyone realizes that it is a place for "insiders" only, and they leave it severely alone unless they feel sure that they can secure the services of an expert who is technically and morally worthy of their confidence. Even then they enter without plunging. Most of the big industries of the country are extended entirely from the inside, with the capital earned in the business.

Not so the coal industry. Anyone, it is generally thought, can dig a hole in the ground and cover it with a "hencoop." They soon learn that the work is one in which all can indeed engage, but in which profits are few. The corner grocery has the same fatal fascination, and for the same reason it is rarely successful. There are far too many grocers for their profit or for the advantage of the public, and in like manner there are too many coal men—so many in fact that they themselves, their employees and the public suffer.

Many are the coal sales agents who have entered the coal business and realized that while the hencoop was easily constructed it was not easy to escape from under it without considerable loss. In fact, in some districts jobber after jobber has tried his hand at operating and failed, and in those parts the mining of coal has proved a persistent source of loss. As in gold mining, more has been put into the ground than taken out. The only men who made money were the sheriff and county recorder.

Thus it is that the hope of the mine owners is in the elaboration of their plants and in the combination of manufacturing with coal mining. Moreover, the large operators are financially responsible and seek to guard their investments by coöperation. The smaller operator knows only two ways to make money—by reducing the wages of his men and by skimping his mining work. But the larger concern guards itself by introducing real economies, and in time will put more advanced products than coal upon the market.

In this connection it is interesting to note the new dye industry started by the Pearsite Co., in Cannel City, Ky., and largely financed by Col. H. P. Bope, of Pittsburgh, a vice-president of the Carnegie Steel Co. This, of course, is a business in which not many can enter, and Mr. Bope will utilize only cannel coal. But the kind of coal used will probably not be restricted to cannel, and there is a broad field related to dyes where many plants could engage.

The Pearsite Co., named after Arthur L. Pearse, an English engineer whose process will be used, will extract the dyes from oxidized cannel, the oxidation being performed in a furnace. The output will be about 5 tons per day. How much coal will be used in obtaining this product is not stated.

So long as the anthracite mine was a hole in the ground without much capital involved and the industry seemed to need neither brains nor financial resources, the market was glutted and no one made money. In those days there was an abundance of little gouge holes in the anthracite region. Everywhere surface beds were being mined or partly mined and partly left and as much or even more capital was squandered in them than was ever made by their exploitation.

In the bituminous region the simpler methods are fast passing. Plants are far more complicated and the visitor is impressed with the technical skill required. But there are enough country banks with shaky drift mouths, wheezy cars and balky mules to induce everyone who can sell coal to enter the mining business. Only by advancing our methods or extending them into the manufacture of power or byproducts can the coal broker be convinced that the coal industry is too specialized a business for him to "butt in" without some previous training.

Trend of the Coke Industry

The erection of byproduct coke ovens is proceeding more rapidly now than at any time in the history of the byproduct process in the United States. The first retort-oven plant in the country began producing in May, 1893. At the close of 1900 there were only 1085 retort ovens in the United States, the production of coke in that year having been 1,075,727 net tons. New construction proceeded at the rate of a few hundred ovens a year, bringing the total number at the close of 1913 up to 5688.

During this time there was a decidedly rapid expansion in the iron and steel industry, whereby the increased coke production was readily absorbed, and the beehive-oven industry did not suffer seriously, though of course it did not show any expanding tendency. The maximum production of beehive coke was reached in 1907 (35,171,665 net tons), while the maximum number of beehive ovens reported by the Geological Survey was 100,362, for the close of 1910. While occasionally a few beehive ovens are built, the number that work out their coal from year to year and are accordingly abandoned somewhat predominates, so that for the end of 1914 only 93,946 beehive ovens were reported.

In the past year or two the erection of retort ovens has been proceeding much more rapidly than before, while blast-furnace construction has been much slower, and thus the iron industry has not expanded with sufficient rapidity to afford a consumptive demand for all the coke that can be produced. The Connellsville coke market has distinctly reflected this situation.

In December steel conditions began to improve, and up to this date there has been continued increase in steel demand and prices. The production of pig iron by merchant furnaces increased more moderately than did the output of steel, but still it increased materially, and early in July pig-iron prices began to rise, the advance to date amounting to an average of fully $1.25 per ton.

Estimates of the capacity of retort ovens vary widely. A claim is made, for instance, that the best type of retort oven can produce at least 13 tons of coke per charge and can coke a charge in less than 24 hr., or more than 4000 tons a year. On the other hand, an estimate based on the showing for the year 1913 would indicate that if the retorts then in operation had operated steadily throughout the year they would have produced about 2700 tons per retort. Using this estimate, noting that the Geological Survey reported 5809 retorts completed at the end of 1914 and adding the 1000 retorts now being built, it is a conservative statement that the industry is making for a capacity of 19,000,000 tons of byproduct coke a year. On the basis of the 1913 production, with allowance for the fact that the beehive ovens ran at least 10 to 15 per cent. below their capacity in that year, the beehive capacity is about 38,000,000 tons, making a total coking capacity of 57,000,000 net tons.

It is possible to make a close estimate of the probable coke demand. In the past five years the production of coke in net tons averaged 48.3 per cent. more than the number of gross tons of pig iron produced. Coke is used in limited quantities outside the iron industry, but the fluctuations could not affect the calculation materially. The present production of pig iron is about 32,000,000 tons a year, which would indicate a current consumption of coke of 47,500,000 tons annually. But there is a fairly well accepted estimate that the actual capacity of the blast furnaces of America is about 35,000,000 tons, thus suggesting a maximum possible coke consumption of 52,000,000 tons. Against this we have a conservative estimate of 57,000,000 tons for the coke capacity, and if the retorts recently built and those under construction approximate the production claimed possible, the coke capacity is well in excess of 57,000,000 tons.

Thus the analysis of the physical situation as to capacity and demand harmonizes completely with the coke-market situation.

Nearing the Century Mark

"Uncle" James Farrar celebrated his ninety-eighth birthday last week at the home of his daughter, Miss Lillian Pledger, in Birmingham, Ala. He followed his vocation as a coal miner until he was over 75.

It is now a well-recognized fact that miners are healthy and hearty, living to a good old age. Only those who are interested in some way in its disproof will venture to deny that fact. A book by Joseph W. Hays, entitled "Combustion and Smokeless Furnaces," published in 1906, states that "coal mining, barring the physical dangers attending it, is a healthful occupation and the coal miner is usually longlived. Post-mortem examinations have developed the fact that the lungs of the coal miner may be absolutely black with coal dust inhaled during many years and these organs be otherwise in a sound and normal condition."

As far as the United States is concerned it may be said that coal mining is without any occupational disease, unless it be miner's asthma. There are no healthier men anywhere than in the mining industry. Stooped they may occasionally be, owing to the low headroom in which they work and the cramped position in which they are always compelled to labor even if in thick beds of coal. Their carriage may also be bad, due to the "uneven going" underground. Moreover, the miners are not quite as active on a sticky hot day as men whose work normally subjects them to the heat of the sun. But, as has often been proved, these outward marks of their profession do not signify any real lack of vigor any more than the rolling gait of a sailor, which connotes habit and not feebleness, shows a lack of health on his part.

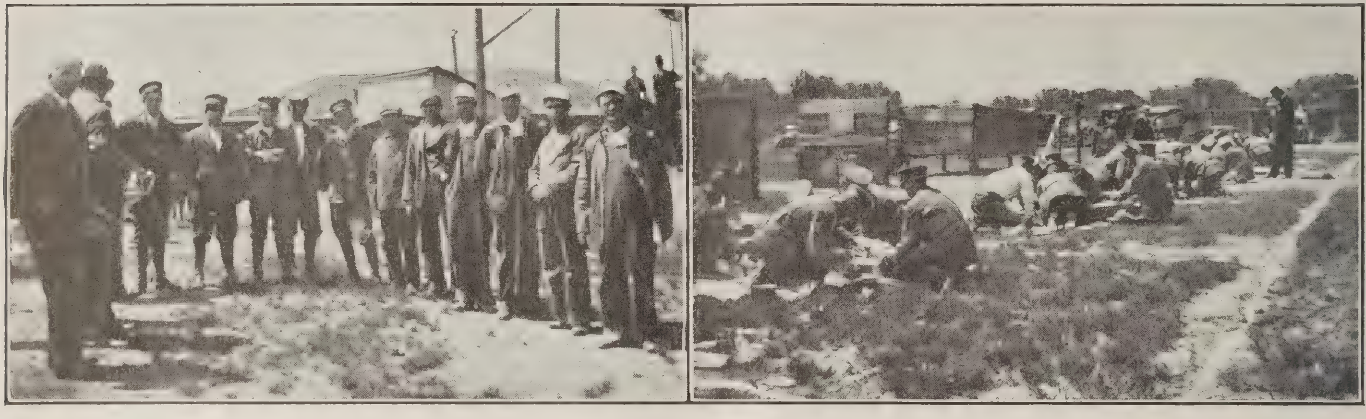
Sociological Department

Victor-American Fuel Co. First-Aid Meet

By C. S. Taylor*

About four thousand people witnessed the first-aid contest of the Victor-American Fuel Co. at Walsenburg on Aug. 28. Governor Carlson was unable to be present and Lieutenant-Governor Harper took his place, presenting the silver cup and medal. Three members of the Industrial Commission were present. The contest took place in an arena provided with a grandstand from which at least 500 people, comfortably seated, could see the contestants. The grandstand was trimmed with patriotic folds of red, white and blue. After the events dinner was served at the Klein Hotel. E. P. Linski announced the events. The work in general was considered of more than ordinary merit. The program was as follows:

One-Man Event—Patient struck by pick. Punctured wound on the inner side of the left thigh; severe hemorrhage. Dress and carry without stretcher 50 ft. to the mouth of the drift.



SCENES IN THE WALSENBURG FIRST-AID CONTEST OF THE VICTOR-AMERICAN FUEL CO.

Winning Team and Officials

Five Teams at Work

A TEAM CARRYING REGULATION STRETCHER

Full-Team Event—Rockfall. Compound fracture of both bones of the left leg in middle third; compound fracture first phalanx of the left thumb; compound fracture of the right side of the lower jaw. Dress and carry 50 ft. on a stretcher.

Full-Team Event—Gas Explosion. Burns of first and second degree of face, neck, hands and forearms. Dress and carry 50 ft. without stretcher.

Two-Man Event—Explosion of blasting cap. Right-hand lacerated in the palm and the skin of all four fingers torn by the explosion. Bright blood spurts from the palm and the patient has a severe shock. Dress and carry 50 ft. without stretcher.

Full-Team Event—Victim rolled between car and roof. Simple fracture of the right thigh at the middle third; simple fracture of the left arm at the middle third and of both bones of the left forearm at the upper third. Dress and carry 100 ft. on a stretcher.

The contest closed with Chandler first with 98.1 points, Ravenswood second with 95.8 points. This is the second time Chandler has won the first prize. The judges were J. R. Hall and R. M. Shea, of the United States Army, and J. W. Amesse, of Fort Logan. Others of note who were there were Dr. John R. Espy, of Trinidad, and F. W. Whiteside, chief engineer of the Victor-American Fuel Co., who had charge of the contest and its business arrangements. Pathé took moving pictures of the field work. S. M. Thompson, representing the Mines Safety Appliance Co., of Pittsburgh, presented the captain of the winning team with a Koehler safety lamp.

* * *

State-Wide Meet in Indiana—A state-wide first-aid meet is to be held at Bicknell, Knox County, Ind., on Saturday, Oct. 30, at 1:30 p.m. It will be under the joint auspices of the United Mine Workers of America, the operators of Knox County, the Bureau of Mines and the American Mine Safety Association. The expenses and medals are to be furnished by local unions and operators of Knox County. In the evening entertainment will be provided.

Labor Day Meet at Boulder—A first-aid contest was held at Boulder, Colo., as part of the program in a Labor Day picnic and fair. Six teams representing coal mines in Boulder County were present and competed. A beautiful silver cup was awarded to the team from the Simpson mine under the captaincy of C. E. Dollar. Second place was secured by a team captained by Robert Pendleton, of Lafayette, Colo. The award was based solely upon skill and precision and not on the time consumed in the work. The judges were Drs. F. H. Farrington, Clay Griffin and Carbon Gillespie.

The Department of Mines of West Virginia is issuing a typewritten list of the persons killed inside and outside of coal mines of West Virginia during the month of August, 1915. There were 35 men killed in all—20 Americans and 15 foreigners. Of these, 34 fatal accidents occurred inside and one outside the mines. The statement gives a detailed account of the location and cause of each accident, with the name, nationality and occupation of the victim. The department requests that it be posted in a conspicuous place, with intention doubtless of warning other men of like dangers. However, descriptions of so many accidents in one bulletin are apt to fail in making a direct appeal, such as would be made by one fatality fully described and with its lesson duly accentuated. Still, a long record without comment conveys its message.

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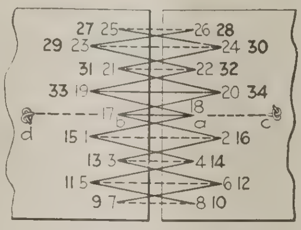
*816 East Colfax St., Denver, Colo.

Discussion by Readers

Mining Machinery--Belting

Letter No. 4—Referring to George N. Lantz's letter, No. 3, *Coal Age,* Sept. 11, p. 431, on belt lacing, I should say that there are three points in which this lacing is open to criticism:

First, it is not symmetrical. It would be better to have *c* and *d* in the same straight line with *a* and *b,* not only for the sake of appearance but for even running as well.



AN IMPROVED BELT-LACING

Second, the lacing takes too big a jump from 16 to 17 and is not at its proper angle. The effect of this would be to pull the ends slightly out of alignment.

Third, it is always advisable, wherever possible, to make the same number of passes of the lacing through each hole. In his joint Mr. Lantz makes two passes through most of the holes, but through *a* and 17 he makes three passes.

In the accompanying figure I have shown a method of lacing such a joint that overcomes the objectionable points I have mentioned. To follow the path of the lace, start down through *c,* up through *a,* then to 1, and finally pass from 34 down through *b* and up through *d* and tie.

N. G. NEAR.

New York City.

[This matter of belt lacing has been interesting and instructive. Let some one suggest other points of similar interest in mining machinery.—Editor.]

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Need of First-Aid Instruction

Letter No. 2—In his remarks on the need of first-aid instruction, published in *Coal Age,* Aug. 14, p. 268, James T. Reynolds concurs in all previous suggestions that first-aid instruction should be given more generally to all mine employees. But Mr. Reynolds, in his last paragraph, advocates that "the mining laws of every state should compel all operators to maintain at their plant at least a few trained men who are competent to give first-aid treatment in case of accident."

I agree with everything that Mr. Reynolds had previously said, but think that this last statement should be broadened so that first-aid training will apply to the entire mine force, to the extent that all employees in mines should have at least sufficient knowledge and training to enable them to do the necessary things to relieve one injured in an accident and, if possible, to save life. If it is good to have a few trained men at each mine, it is surely better to have a larger number of men who possess the necessary knowledge and training to make them useful in case of accident. I am of the opinion that before first-aid work can become a thoroughly effective agency in mining, all mine operators and superintendents must maintain training schools at their mines, where all mine employees shall receive sufficient instruction and training to make them of service in time of need. Such a requirement might well be incorporated in the state mining laws.

With a view to greater protection of life and property, most mining laws require all mine officials to pass an examination and hold a certificate of competency before they can act in the capacity of mine foreman, assistant mine foreman or fireboss. I would ask why the mine laws should not require that all miners and mine employees should possess some training in first-aid work before being permitted to work in the mines.

It may be urged that a knowledge of first-aid work on the part of every employee will not eliminate mine accidents; but while this is true, I claim that the possession of such knowledge will often save life and reduce the later effects of the accident that otherwise would be inevitable. The purpose of such a provision in mining law would not be so much to reduce the number of accidents as to lessen their effect.

JOHN ROSE,
Former District Mine Inspector.

Dayton, Tenn.

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Compensation in Relation to Constitutional Rights

In a letter published in *Coal Age,* July 3, p. 25, A. M. Iner makes some interesting remarks on Pennsylvania's recently enacted Compensation Law, and expresses his surprise that so important a piece of legislation should have brought practically no comment in the pages of *Coal Age,* either editorially or otherwise. Further, this correspondent points out what he considers certain bad features of the act, and it must be admitted at the start that if one-half of the fears expressed by Mr. Iner are realized the future holds almost as little encouragement under the Compensation Act as the past held under the old Liability Law, particularly for the injured employee or the wife and children bereaved by the accident.

One readily shares Mr. Iner's surprise that so little has recently been published regarding legislation intended to mean so much to the mining fraternity as well as to other workers in hazardous occupations of the state. But, speaking personally, unlike his, my surprise is an agreeable one, since the quiet acceptance of this "class legislation" by the men of the mining industry indicates a readiness to let the future decide its good and bad features. The complacency of mining men, who as a class are invariably arrayed against anything they conceive to be inimical to their individual or general interests, indicates a satisfaction in the accomplishment at last of a duty long deferred by the state. Most mining men, it would seem, are willing, for the real test of this enactment, to be its practical application. I believe the majority of us are optimistic enough to think that this new Workman's Compensation Law will eventually be proven of inestimable benefit to the state at large, as well as to those men so unfortunate as to come under its provisions and to the widows and children for whom it provides.

In the article to which I have referred the author evidently fears that the miners of this state have "asked for bread and been given a stone." He seems to think that they have sought alleviation of one of the chief burdens of the industry and it has been granted at the sacrifice of certain inalienable, individual and constiutional rights. This, by the way, is one of the antique stock arguments that have ever been used against an equitable, fair, business-like and humane compensation law in this and other countries.

It may be true, as Mr. Iner avers, that this particular act robs the workman and, incidentally, the workman's wife and little ones, or the mother depending on his earnings, of certain individual rights. So does temperance reform rob the drunkard of the means of debasing himself and bringing misery on his family. The cases are analogous in some respects unnecessary to consider here. The act does indeed rob the workman and his family, but of what? It removes the dread of poverty, starvation and pauperism, which were formerly the inevitable result when a workman was deprived, by accident beyond his control, of his ability to labor. Regarding that phase of the question I will not attempt to argue, since, with Mr. Iner, I lament the fact that I am merely a mining man and not an expert on the constitutional rights of the miner to suffer needlessly. However, it does not require a constitutional lawyer to decide which would mean the most to a widow left with a family of small children after the death of her husband—his constitutional rights or 50 per cent. of his wages for five hundred weeks. I have my own opinion as to which of these will go farther toward paying the grocer and butcher and keep the family together in the home, after the father has been removed by death.

Mr. Iner truthfully remarks that, under the present law, an injured workman possesses the right to seek redress through the process of common law where he would stand some chance of proving his claim. But if Mr. Iner is as practical a mining man as his article indicates he will certainly have seen what has convinced me, as it has thousands of others interested in the matter, that the chance of securing anything substantial through the processes of law are very slim indeed. We all know that under the old Liability Law, which remains in effect in Pennsylvania until January, 1916, the injured miner or his widow and children if he is killed at his work have a chance of seeking redress in the courts. But statistics, as well as observation, compel the assertion that the "chance" is about all they will get. The records show that for every miner injured through no fault of his own and awarded an adequate verdict at the hands of the court, there are dozens who should have the same but have not. And those who gained their case received practically nothing, except in rare instances, as the award when made went chiefly to enrich the lawyers.

To refer again to cold-blooded statistics, it has been shown that under the old Liability Law less than 40 per cent. of the money paid by employers in the United States went to the men, women and children for whose care and comfort it was intended. This of itself is pathetic, unbusinesslike and inhumane; but, what is worse, nearly one-half of that 40 per cent. went to the lawyers interested in the case.

The pernicious effect of such a system, which the new Compensation Law expects to replace, might be better understood by quoting from a pamphlet that I read before the West Virginia Coal Mining Institute, at Wheeling, some years ago. Statistics for that article advocating such compensatory laws were laboriously gathered from almost every Government in the world having an accurate tabulation of their several laws governing this matter. But lack of space prevents other than the following quotation taken from the records of a county in Pennsylvania:

> The bad effects of such a system [the method of deciding and paying through the courts] can best be grasped when statistics of one county near here recorded in a given period 304 fatal accidents. Following this, 200 families were left dependent on the whims of courts and juries, and as a result 88 of said families received not one cent of compensation following the death of their breadwinner. Practically the entire 300 men killed were contributing, at the time of their death, to others besides themselves. Ninety-two families received funeral expenses only. Thus 180 of the 304 cases cited were left to bear the entire loss of income. Of the families remaining only 62, or approximately 20 per cent., secured through the courts more than $500—a sum approximating a single year's labor wage of the lowest-paid workman killed.

Surely an equally burdened number of dependents in the future will not grieve over being deprived of any rights at law that gave others in a like predicament such munificent results. Surely no compensation act conceived by civilized men (outside of the legal fraternity) can hold any worse prospect than that.

SIM. C. REYNOLDS.

Houston, Penn.

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Handling Explosives in Mines

Letter No. 1—In considering the various suggestions made in respect to increasing the safety of mining operations and the prevention, as far as possible, of explosions in mines, there is no subject of greater importance than that of handling explosives in the mine. After a long and varied experience in the storage, use and handling of explosives I am led to offer the following suggestions, in the hope that they may be the means of avoiding some of the accidents that are due to carelessness or a lack of knowledge on the part of many whose duty it is to use this dangerous material in their daily work:

Miners should be educated in the storage and, particularly, in the use and handling of explosives. They should not only be given a copy of rules, but should be instructed verbally in this regard. The United States Coal and Coke Co., at Gary is very strict in its observance of these precautions. Each miner is supplied with a copy of the rules, printed in his own language, and given verbal instructions by the company inspector, as well as by the mine foreman and his assistant. If he cannot read he is questioned on the rules until he becomes thoroughly acquainted with what is required.

The following description of the elaborate system employed by the Horden Collieries Coal Co., of England, in respect to the storage, handling and use of the explosives used in their mines will be of interest:

The company's magazine is located 3000 ft. from the tipple. The building measures 12x12 ft., and is 7½ ft. high inside. The walls are of concrete and 8 in. thick. In one corner is a large cupboard for the storage of detonators, while the remaining space is occupied by explosives. The floor and partitions are of wood and wooden pegs are used instead of nails. The locks, hinges and other fastenings are of brass. There is an 8-ft. fence around the building and no one is permitted to enter this inclosure except the attendant, who is supplied with a locked safety lamp and wears rubber shoes.

There is an excellent system employed in distributing explosives to the miners. Each man is supplied with a metallic canister stamped with his check number. Upon reaching the outer door of the magazine, he calls out his number and receives his canister from the attendant, a record of the amount of powder in the canister having been previously made in a book kept for that purpose. At the end of the shift the miner returns his canister to the magazine, when the contents remaining in the can are noted and the quantity used is charged to the miner. The form of this book is as follows:

Date	Check Number	Name	Weight of Powder (Oz.)		
			Issued	Returned	Used

The detonators are never handled by the miners; they are carried into the mine in locked tin boxes by the shotfirers or deputy overmen. Each shotfirer has a number, and this number is stamped on the box containing the detonators in his charge. A record is kept of these detonators in a book similar to that used for explosives. The book form is as follows:

Date	Box No.	Name	Number of Detonators			
			Issued	Returned	Used	Bad

In this mine the coal is undercut by compressed-air machines and the holes drilled by air drills. The mine is divided into separate districts, each district having a deputy overman or shotfirer in charge and one man to drill the holes. The shotfirer carries with him a wooden tamping rod, having at one end a copper scraper. His duty is to clean, charge and tamp all holes, using only clay for the tamping.

The shots are fired with an electric battery, and not less than 50 ft. of cable is allowed to be used in this work. Only one shot is fired at a time. After firing a shot, the shotfirer must disconnect the cable and take the key from the battery, before proceeding to make the connection for firing the next shot. I may say that accidents from explosives and the occurrence of blownout shots in this system of firing are a thing of the past. I am convinced that it only requires a thorough system of storing, handling and using explosives, and a safe and reliable method of firing the shots, to eliminate completely the occurrence of accidents along this line. I hope to see others give their experience and suggestions.

Marytown, W. Va. JAMES THIRTLE.

Labor in Mining

Letter No. 10—The discussion in *Coal Age* in reference to the question of why strikes occur so frequently in coal mining has been one of growing interest. I think that Hugh Archbald, judging from his article on this subject, *Coal Age*, July 24, p. 124, has not had much experience with the United Mine Workers of America. Either that, or he is able to handle them better than the rest of us. I have had some dealings with this organization and am able to say that its chief aim appears to be to get something for nothing, in any way and by any means possible. Its chief weapon is the strike, which always makes someone go hungry, and the men on strike lose more money than they gain.

I recall an instance of this kind where the miners asked for a 5-per cent. increase, but the demand was promptly refused by the operators. A strike was called, which lasted two months, and at the end of that time we went back to work with something like a 2-per cent. increase. But one can readily see that had the full 5 per cent. been granted the men, this would not have made up for the two months' full pay lost, as the following figures will clearly show:

The average earnings in this district were \$65 a month, or \$780 a year. Adding the 2 per cent. allowed, increased this pay to \$66.30 a month, which amounted to \$663 for the entire 10 months following the strike. This showed a loss of \$780 — \$663 = \$117 for each man for that year. Had the full 5 per cent. increase been allowed, the pay would have been \$68.25 a month, which would have amounted to \$682.50 for the entire 10 months following the strike. This would have shown a loss of \$780 — \$682.50 = \$97.50 for each man during that year.

But these figures do not show all that the strike cost the men, as miners always spend more when they are idle than when they are working. I can heartily endorse every word that S. A. Driver has said in his Letter No. 8, Aug. 28, p. 349. I want to congratulate Mr. Driver for the letter he has written, which exposes the whole scheme of labor organizations as they have been conducted. This letter should be read by every member of the union, and especially by union leaders, who should profit by the lessons taught therein. I believe thoroughly that the operator of a mine should have the authority and the right to choose his own working force and to hire and discharge his men at will. This is the only way in which discipline can be maintained in the mine. No men or organization of men should be permitted to usurp this authority in respect to the employment of workers in the mines.

In my experience I have frequently known the pit committee to present complaints that did not come from the men but emanated solely from the committee. When certain rules were posted at the mine it would often happen that the committee would object to their being enforced, claiming that the matter was not mentioned in the contract and stating that trouble would follow if the rule was not rescinded.

Another instance that I recall was where an assistant foreman used a driver to run a motor for a few days when the motorman was absent from the mine. A little later a vacancy was quickly filled by a competent motorman, which was a proper thing for the company to do. The miners, however, took exception to this, claiming that one of their own men should have been chosen for the place. Failing to obtain any satisfaction from the superintendent, the matter was taken up by the committee with the district officials of the union. The result was that the new motorman was charged with "taking a job from a brother miner." These facts illustrate how the principles governing the union work against the efforts that are being made by coal operators for the betterment of the miners. When so much has been done to improve their conditions in the mine and living conditions in the camp, it is discouraging to companies to have to face these conditions, for which the union alone is responsible. It requires a big-hearted man to overlook the foibles of this class of mine workers, who I am glad to say are greatly in the minority.

What a boon it would be to coal mining if every mine worker would consider the interest of his company as his own interest, and the operator, in turn, regard the welfare of his employees as his own welfare. It would not be long then before trouble makers would be forced to find other employment than that for which they are paid by the union. That would be a glorious day for the mining industry. The industrious mine worker would feel more at ease and be able to settle down and make his own home, where he could live in cheer and comfort with his family.

Mr. Driver has illustrated well the true conditions growing out of the influence of the union to compel a fixed wage scale, where he cites the case of a man who had worked in the mine all his life but was compelled to accept the same day wage as another man who had never been in a mine until the day he was given a job greasing cars at the bottom of the shaft. I think with Mr. Driver that it is difficult to understand how Mr. Archbald, an efficiency engineer, can advocate these principles from his standpoint.

It cannot be wondered that men who have striven by study to improve themselves that they might qualify for a higher position should be discouraged. It is often remarked, "What is the use of studying to fit yourself for a higher place, when the union will see that you get the place whenever there is a vacancy?" I have heard men remark more times than I can tell that "there is no use to study any more when everybody draws the same pay." Again, "If the boss finds that I know more about some things than the other fellow he will impose upon me, and it is better that I should not know so much, unless I can get more pay."

An honest worker, striving to better himself and do better work for the company, gains nothing, but rather loses, because he accomplishes more than his fellow-worker, but is paid the same scale. For his pains he is often called a company's "sucker"—a term that is the next thing to being called a "scab," in return for which any man will fight. This discussion has done much good, and if men will heed what has been suggested the future will see a great improvement. There will be developed a class of miners striving to provide for their families good homes and anxious to become loyal citizens.

ASSISTANT FOREMAN.

Bevier, Ky.

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Study Course in Coal Mining

By J. T. Beard

The Coal Age Pocket Book

The Circle—In the mensuration of the circle, the ratio of the circumference of the circle to its diameter is a constant factor, which is the same for all circles and is designated by the Greek letter (π) pi.

Value of π—The length of the circumference of a circle cannot be expressed exactly in terms of its diameter, although numerous attempts have been made since the time of Archimedes, and the value of π extended to 35 decimal places without reaching a final result. For all practical purposes, however, this value is $\pi = 3.1416$.

Formulas—Calling the radius **r**, diameter **d**, circumference **C** and area **A**, for any circle:

Circumference, $$C = \pi d = 2\pi r \qquad (1)$$

Diameter, $$d = \frac{C}{\pi} = \frac{C}{3.1416} \qquad (2)$$

Radius, $$r = \frac{d}{2} = \frac{C}{2\pi} = \frac{C}{2(3.1416)} \qquad (3)$$

Area, $$A = C \times \frac{r}{2} = \pi r^2 = 3.1416\, r^2 \qquad (4)$$

$$A = \pi\left(\frac{d}{2}\right)^2 = \frac{\pi}{4} d^2 = 0.7854\, d^2 \qquad (5)$$

The Arc of a Circle—An arc of a circle is a portion of its circumference. The arc is measured by its subtending angle, or the angle it subtends, which is the angle formed by the two radii drawn to the extremities of the arc. Thus, in Fig. 1, the arc AmB is measured by the subtending angle AOB; the arc BC by the angle BOC; and the sum of these two arcs, or the semicircle ABC is equal to 180 deg. or two right angles, the full circle or circumference being 360 deg.

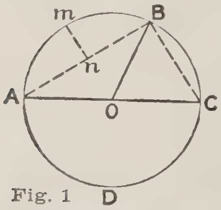

Fig. 1

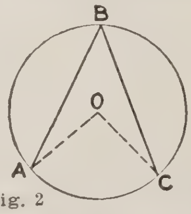

Fig. 2

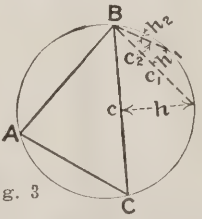

Fig. 3

The Chord of an Arc—A chord of an arc is the straight line joining its extremities. A straight line joining any two points of the circumference of a circle and not passing through its center is a chord of that circle. In Fig. 1, the dotted lines AB and BC are chords; but the line AC, passing through the center O, is the **diameter of the circle.**

The **rise of an arc** of a circle is its perpendicular distance from the chord, at its center. Thus, in Fig. 1, the line mn, drawn perpendicular to the chord AB, at its middle point n, is the rise of the arc AmB.

The Coal Age Pocket Book

A **segment of a circle** is that portion of the area of the circle bounded by a chord and the arc it subtends. Thus, in Fig. 1, AmBn is a segment of the circle ABCD.

A **sector of a circle** is that portion of its area bounded by an arc and the two radii drawn to its extremities. Thus, in Fig. 1, OAmB is a sector of the circle ABCD.

Calculation of Area—The area of a sector or segment of a circle, like that of the circle, can only be approximated. If the angle subtending the arc of the sector or segment is given the **area of the sector** is found by multiplying the area of the circle by the ratio of the given angle to 360 deg.

The **area of the segment** is then found by subtracting from the area of the sector, the area of the triangle formed by the chord and the two radii. The area of this triangle is equal to the product of the half-chord and the radius less the rise of the arc.

When the subtending angle is not given, the area of a sector must be found from the length of its arc; thus,

Area of sector = ½ *length of arc* × *radius*

Not knowing the subtending angle, the length of the arc must be calculated from its chord and rise or the radius of the circle. This calculation depends on a principle that admits of a close degree of approximation.

Principle—The chord of any arc of a circle is a mean proportional between the diameter and the rise of twice that arc.

The repeated application of this principle makes it possible to calculate successive subchords, or chords of half the preceding arc. Each successive subchord more closely approaches the line of the given arc.

Formulas—The following formulas are employed:

Let l = length of arc;
h = rise of arc;
c = chord of arc;
($c_1, c_2, \ldots c_n$, successive subchords)
n = number of subchords;
r = radius of arc.

First subchord, $$c_1 = \sqrt{2rh}$$

Rise of half-arc, $$h_1 = r(1 - \sqrt{1 - h/2r})$$

The next successive subchord and rise are then calculated by substituting for h the value of h_1 found. This process can be continued to any desired number (n) of subdivisions. The last subchord (c_n) multiplied by the number of subdivisions (n) will be approximately the length of the arc.

Length of arc, $$l = nc_n = 2n\sqrt{h_n(2r - h_n)}$$

Area of sector, $$a = \frac{lr}{2} = nr\sqrt{h_n(2r - h_n)}$$

Area of segment, $$a = nr\sqrt{h_n(2r - h_n)} - \frac{c}{2}(r - h)$$

Inquiries of General Interest

An Electrical Transmission

I want to inquire as to the actual advantage in the operation of a direct-current dynamo at our power plant. At this plant we have two direct-current machines, each having a capacity of 150 kw. at 250 volts. The line transmission consists of four large copper wires extending from the power house to the mine. The first mine is located at a distance of ¾ mi. from the power house, while the second mine is at a distance of 1½ mi. from the power house, and the entry in this mine is almost a mile long. At present we are operating the two dynamos in parallel. I would like to ask, Would it be better to separate the transmission lines leading to these mines and operate the dynamos independently of each other?

Is it possible to use the rails of the tracks for the return current? Also, at what distance would you advise to discontinue the use of a direct-current dynamo and install in its place an alternating-current machine?

M. K. Marlowe.

Block, Tenn.

The choice between the use of a direct-current and an alternating-current machine in electrical transmission is purely an economic consideration. It is generally better to employ a direct-current machine whenever the distance is such that the line drop is not excessive. The available voltage at the end of the line must be sufficient for the load at that point. When it is possible to use a direct-current transmission, the necessity for converting the current, by means of a rotary converter or a motor-generator set, is obviated. On the other hand, it often happens that the length of transmission is such as to require the use of the alternating current, in order to avoid excessive expense for copper. Another feature that must often be considered is the price of electricity. When this is high, it may often prove advisable to adopt an alternating-current transmission, which permits the use of a higher voltage and a smaller current, requiring less copper for the same work to be performed. However, a change from direct-current to alternating-current transmission may necessitate changing the mine motors. These questions must all be considered beforehand.

In the present case it may be stated that there would be a decided advantage in operating the two machines independently, using a separate line transmission for each mine. By this means the available voltage at each mine could be regulated to suit the conditions of transmission, and it would not be necessary to operate the motors at the nearer mine at an unnecessarily high voltage, such as is required for the longer transmission of current to the second mine.

In reference to the use of the track rails for the return current, this should always be done when it is possible to provide and maintain a good bonding of the rails. By the use of a rail return the cost for copper is reduced, the double trolley system is eliminated and the rail return reduces the total resistance for transmission.

No distance can be stated as the limit for the employment of a direct-current transmission, since for the reasons given the choice between direct and alternating current depends on many conditions not named in this inquiry. It is a matter that must be worked out for each individual case by a competent electrician who is fully acquainted with the requirements in any particular case.

To Rescue a Drowning Person

Can you inform me of the best method to adopt to rescue a drowning person? In other words, if a man was seen to be drowning in deep water, and a good swimmer went to his rescue, what method should the swimmer adopt; and how should he approach and handle the drowning man, in order to protect himself and rescue the man?

Rescuer.

Oakview, Colo.

The first consideration of a rescuer in a drowning accident is, obviously, self-preservation, for only in this way can a double tragedy be avoided. A poor swimmer should never go to the rescue of a person drowning in deep water except in a boat or supported by other means that will assist him in effecting the rescue. There is more or less exaggeration, however, regarding the danger attending the rescue of a drowning person by a strong swimmer. The chief requirement in this case is that the rescuer shall keep reasonably cool, use his judgment and endeavor to reassure the victim in a manner that will tend to restore his self-confidence.

When attempting a rescue under the conditions described, one should maneuver so as to approach the victim from behind. He is then in position to grasp the person by the arms near the arm pits. Then, if he is expert in the water, it will not be difficult for him to swim on his back, propelling himself with his feet and holding the sinking one over him, taking care to keep his mouth above the surface of the water. If the rescued one offers no resistance, the rescuer may be able to hold him in position by placing his left hand under his chin, which will leave the right arm free for swimming.

If the victim struggles violently, however, it may be necessary to adopt drastic measures and render him unconscious by a blow on the head, which is not always possible. It is better to hold the head of the drowning person under the water until he becomes quiet. In case the drowning man succeeds in locking his arms about the rescuer so as to render him powerless, the latter may be able to hold his breath under the water in hopes that the other will relax his hold. Such an event presents the most serious aspect that could arise and must be carefully avoided, if possible. The best means of breaking the death grip of a drowning person is to raise one or both knees and thrust them against his or her chest. The entire strength can thus be used to force the struggling person to loose his grip on the rescuer.

Examination Questions

Tennessee Examination for Mine Foremen, Etc.

(*Continued from Last Issue*)

Ques.—If you were in charge of a "Class-A" mine, employing an average of 100 men and 10 mules, how much air would be required, in order to comply with the mine law? Would you be satisfied with this amount of air, and if not, how much air would you require for the ventilation of the mine?

Ans.—Sec. 9 of the Tennessee mining law designates a "Class-A" mine as one "known to liberate firedamp (CH_4) at present or in the future." For such a mine the law requires a circulation of 150 cu.ft. of air per min. for each person and 600 cu.ft. per min. for each animal employed in the mine. To comply with this law, the volume of air supplied to the mine must be $100 \times 150 + 10 \times 600 = 21{,}000$ cu.ft. per min. Under general working conditions this volume of air would be insufficient for the thorough ventilation of a mine of this size generating marsh gas in considerable quantity.

The volume of air required for efficient ventilation of the mine will depend on the number of splits and the area of the air passages, in addition to the number of men and animals employed in the mine. In any case the velocity of the air current must be sufficient to effectually sweep away the gases that would otherwise accumulate in the working places and in the void and abandoned places in the mine. Also, the air volume must be sufficient to dilute the gases generated so as to render them harmless. The velocity of the air sweeping the working faces should be from 200 to 300, or even 350 ft. per min., depending on the quantity of gas generated.

Ques.—In a wreck that causes a trolley wire to fall, if a man receives a shock and, becoming unconscious, falls on the wire, describe in what different ways you would try to rescue him from danger and how you would attempt to resuscitate him after getting him off the wire.

Ans.—Replying to the first question, grab him by his loose garments if these are dry, and jerk him quickly in a way to remove him most readily from the wire. If a dry pole or stick is at hand this may be used to roll or push him from the wire. A dry coat or jacket or anything at hand will be useful to employ in grasping the man and dragging him from his dangerous position. In any event, avoid standing in water or coming in contact with his wet clothing. Of course if rubber shoes or gloves are available, these should be used as being good insulators. Always stand on dry ground or a dry board, and avoid, by all means, coming in contact with a live wire or rail. The trolley wire may be safely cut by a sharp ax or hatchet having a dry wooden handle. It is well to grasp the handle with a dry cloth or piece of clothing, or, better still, a silk handkerchief, as silk is one of the best of insulators.

Replying to the second question, in order to restore the man to consciousness or to invigorate him if still conscious, the treatment to be employed after he is removed from contact with the wire is artificial respiration. This should be done promptly. The Schaefer method is the best to adopt. In this method the man is laid at full length on the ground, with his face down, care being taken to see that his mouth is open and that the tongue falls forward. The head should rest on one arm, while the other is extended above the head, which is turned slightly to one side to permit the free access of air to mouth and nostrils. Kneeling on one side, or astride of the man, without resting on him, the operator places the palms of his hands on the short ribs across the small of the man's back, with thumbs almost touching. Then, by alternately pressing downward, so that the weight of the operator's body compresses the chest of the victim, and rising again so as to give opportunity for the chest to expand, and repeating these movements at the rate of about 12 to 14 a min., the action of breathing is duplicated and air induced to enter the lungs.

Ques.—What are the main points to be considered in respect to a good mine door?

Ans.—First, the door should be located, as far as practicable, in a straight portion of the entry, and under good roof where the opening is not too wide. It should never be located at the foot of a grade, where cars may not be under control. Second, a substantial frame should first be erected in the entry by setting two good posts, one on either side of the road, a short distance outside of the rail. If no crossbar is used at the roof a heavy plank should be spiked on the outby side of these posts close to the roof. This should extend the full length of the entry, from rib to rib, a lighter post having been set close to each rib. The open space on each side of the road is now closed by nailing short boards to the posts, and the entire frame is calked with waste or old canvas so that it is air-tight. The door itself is made of a double thickness of boards nailed together and framed diagonally or on the bias, so as to provide a sufficient support and prevent the sagging of the door. This is hung on the intake side of the door-frame and given a slight fall, so that it will be impossible for it to remain open unless it is propped back or otherwise held.

Ques.—State the advantages and disadvantages of the use of curtains instead of doors, and explain where you would prefer to use a curtain instead of a door, giving the reasons why.

Ans.—A door has the advantage of being more permanent and deflecting the air more completely than a curtain, while a curtain is more quickly hung and costs less than a door, besides presenting less obstruction in the entry in case a driver loses control of his car.

A curtain is generally preferred where it is desired to partially split the air, sending a portion of the current through the rooms, while a small scale of air continues to travel the entry. Also, wherever the arrangement is only temporary, and quite generally in the workings, while doors are usually preferred on main haulage roads and airways and between sections of the mine.

Coal and Coke News

Washington, D. C.

Information from the Canal Zone shows that work on the coaling facilities there is progressing fast. At the Pacific Terminal the erection of the unloader towers is going rapidly forward. Excavation at the west end of the unloader towers and wharf was continued during August. At the reloader wharf work has continued on excavating caissons placing excavating steel and sealing the caissons. The excavation in the caissons amounted to 1,162 cu.yd., 336 cu.yd. of which was hard rock. To date 76 caissons are under way and 48 sunk to rock.

At the Atlantic Terminal eight of the end wharf caissons have been sealed and seven filled with concrete. Eighty linear feet of floor containing 655 cu.yd. were poured for the unloader wharf and 200 lin.ft. of floor containing 1,365 cu.yd. were poured for the reloader wharf. Caisson foundations for the unloader and reloader wharves were completed.

At the end of the month excavation was completed in all but six of the 31 caissons. The erection and riveting of deck steel for both unloader and reloader wharves were entirely completed. The installation of hoppers and chutes on bridges and bridge diggers is proceeding rapidly. The operating cabs on diggers have been partially enclosed, and transformer house and controller coops completely housed with corrugated iron and siding, but no floors installed.

Steel for all four towers is about 99 per cent. completed and 98 per cent. riveted. Fuel oil plants have likewise been carried much further toward completion, the building being substantially completed at the Mount Hope plant and well advanced at Balboa.

Trade Commission to Again Get Into Action

It is expected by the 25th of September practically all, if not all, of the members of the Federal Trade Commission will have reached Washington ready for resumption of work. One or two are already in residence. It is stated that many complaints and various letters of inquiry concerning mining enterprises of various descriptions have reached the Commission from investors and others.

There were already a good many inquiries and communications from small stockholders and representatives of minority stockholding interests who desired aid in different ways from the Commission. One of the first pieces of work to be undertaken by the Commission will be a report on the hearings hitherto held both before and during the recent trip.

PENNSYLVANIA

Anthracite

Weatherly—The Lehigh Valley Coal Co. has just put into operation a new mine on Buck Mountain and has named it Council Ridge colliery.

Bloomsburg—Judge Evans, of the Columbia County Court, has issued an opinion restraining the County Commissioners from refusing to print the name of Keran Donahue as a candidate for mine inspector at the primary election. This case was similar to the one brought in Schuylkill County in which it was sought to prevent nominations for mine inspector on the ground that it was a state office and could not be voted on at a county election. In this latter case the Supreme Court granted a supersedas and it was on this bill that Judge Evans based his opinion.

Lansford—After making full time practically all summer the collieries of the Lehigh Coal & Navigation Co. in the Panther Creek Valley were compelled to shut down recently from Friday night until Wednesday, due to a lack of orders caused by the unprecedented heat wave which gripped the eastern seaboard for about two weeks.

Scranton—An explosion in the Surface Vein in the National mine recently tore through to the surface and wrecked the garden of Frank Mangan. Vegetables were uprooted and thrown high in the air. This explosion occurred about two miles from the National Colliery.

Duryea—While at work in the Hallstead mine of the Delaware, Lackawanna & Western Coal Co., five men were recently burned by gas, three receiving serious injuries. They were all, however, taken to their homes in Duryea, and at Simpson.

Bituminous

Connellsville—Production of coke throughout the Connellsville region recently attained approximately 390,000 tons per week with shipments at about the same figure. Stock coke has practically disappeared from the region.

Star Junction—Preparations have been made by the Echard Coal & Coke Co. to put the plant in readiness to start. Orders for firing the ovens are expected shortly.

WEST VIRGINIA

Charleston—West Virginia coal operators who ship their products to Western markets over the four trunk line railways operating in West Virginia will make a centralized fight against the proposed 60 per cent. increase in freight rates for the transportation of coal to Western points. While the tariffs proposing the increase have not yet been filed with the Interstate Commerce Commission by the railroads, the operators have been informed that they are now being prepared.

Eccles—The hoisting engineer for the New River Collieries Co. was recently arrested for neglect of duty, brought before a justice of the peace and fined $50. The engineer had charge of the operation of the fan, and was found asleep on duty. As a consquence of his neglect the fan had greatly slowed down in speed, thereby endangering the lives of those at work in the mine. This occurred at shaft No. 5 where the explosion of Apr. 28, 1914, occurred.

Charleston—Thirty-five men were killed during the month of August in the mines of West Virginia. As usual, falls of coal and slate were responsible for most of the fatalities.

ALABAMA

Birmingham—The Alabama Safety Association will hold a big field day meet on October 8 at the State Fair grounds and the State Fair will coöperate with the association in making awards.

Lewisburg—The coke ovens of the Alabama Co. at Lewisburg and Brookwood have been relighted after being shut down for several months. The two furnaces of this company at Gadsden will probably be started soon.

KENTUCKY

Lexington—An all-day meeting of the board of directors of the Kentucky River Coal Corporation was held recently in this city, attended by the leading officers of the company. President W. S. Dudley, of Lexington, presided. It was stated after the meeting that routine business, details of organization, etc., were given the attention of the members present. A large number of leases of coal lands held by the company were passed on, it is said.

Pikeville—The coal business throughout this region is showing considerable improvement, and it is believed that this improvement means a similar change in the business of railway companies. Various improvements are being installed throughout this region in anticipation of a heavy output next year.

OHIO

Bellaire—The Blakewell Coal Co. recently ordered out a force of 10 men to report at its Georgetown mine to clean up and repair the development. It is believed that this mine is about to resume operation. When working full it employed 150 men, but has been idle since the start of the strike over a year ago.

Gloucester—Mine No. 22 of the Hisylvania Coal Co. was put out of commission recently, because of an accident to the machinery. The damage will be repaired within a week.

Athens—Mine Inspector J. M. Roan, assisted by a corps of helpers recently opened mine No. 211 of the Sunday Creek Coal Co., located near Athens, which was sealed up last May, following a disasterous fire. When the mine was opened it was found that the fire had burned itself out and that a large quantity of coal had been consumed. The fans were started and ventilation established. The Sunday Creek Coal Co. will not operate the mine for the time being, as all of its Ohio mines are closed.

New Straitsville—The Jones Bros. mines near New Straitsville were seriously damaged by a flood a short time ago. Damage was also done to a Sunday Creek mine at Nelsonville and a mine of the Corning Mining Co. at Corning.

INDIANA

Brazil—Clay County is beginning to fear that coal stripping operations are going to interfere materially with agricultural pursuits. The Ehrlich Pierce Co. of Turner, Ind., has begun stripping on 1,000 acres near Staunton and there are several other stripping pits mining at a depth of 9 to 30 ft.

Washington—An unusual occurrence—lightning entering a coal mine—is reported from the Cannelburg mine of the Daviess County Coal Co. The bolt struck the top of the tipple, ran down the sides to the water pipes and entered and lighted up the mine where 100 men were at work. Four men were in the weighroom through which the bolt passed. They were uninjured.

Oakland City—An explosion in the T. C. Bugg mine recently injured one man seriously and three others slightly. The mine had been idle while a new tipple was being built and the men entered the workings before the air had been thoroughly circulated.

COLORADO

Denver—The Colorado Fuel & Iron Co. has posted, at its numerous coal mines in Colorado, notices to the effect that hereafter no man over 49 years of age, or apparently over that age, and no boy under, or apparently under, 16 years of age, will be given employment. This rule has been made by this company as a precaution against excessive demands for indemnities under the new employees law but it does not affect those men or boys in the employ of the company prior to Sept. 1, 1915. In the future, according to this same rule, each new applicant for employment must, if requested, submit to a medical and physical examination by the company's physicians.

The state industrial commission has notified the coal operators of Colorado that no reductions will be made under the new workmen's compensation law from the rate already in use under the old line insurance companies, namely $7.47 per $100 of payroll. This rate when compelled to be paid will make the cost of compensation insurance run into high figures, and the matter is arousing much discussion among the coal men. Many of the large companies are opposed to having insurance written in the state fund as the latter carries the coal mine risk. It is understood that a number of the coal operators will form a mutual insurance company, as they are authorized to do under the law. Others of the large concerns will prefer to carry their own risks and file a bond with the commission to guarantee payment of compensation losses.

ILLINOIS

Chicago—The Southern Illinois Coal Operators' Association has filed with the Interstate Commerce Commission a petition asking for a rehearing of the Western rate case.

Danville—Control of the Dering Coal Co. properties at Westville and West Frankfort has passed into the hands of the Producers Coal Co., which is headed by F. S. Peabody. This firm will operate the property for the Continental & Commercial Bank, and for Kuhn, Loeb & Co., of New York.

La Salle—It was announced recently by the La Salle County Carbon Coal Co. that its mine on East First St., La Salle, would shortly begin operation with a full force of employees. For some time past preparations have been made for starting, while during the period which the mine had been shut down, a number of improvements have been made. Two hundred and fifty men, and possibly more, will resume work at this operation.

FOREIGN NEWS

Nuneaton, England—Several hundred miners were trapped at Exhall colliery Sept. 21 as the result of a fire. The cage employed to bring workmen to the surface was destroyed, but out of about 250 miners in the colliery at the time of the disaster, 200 were rescued by means of an emergency shaft.

Essen, Germany—It is reported that the German Coal Syndicate has been prolonged for 15 months. It was apparent that the Syndicate would be dissolved at the expiration of the present agreement, but the federal council issued a decree for a compulsory organization under government auspices unless the mine owners settled their differences.

PERSONALS

William J. Harris has been appointed Pittsburgh representative of the Star Manufacturing Co. of New Lexington, Ohio.

W. C. Coke and G. B. Taylor, both of Pittsburgh, have been appointed explosive chemists in the Bureau of Mines at Pittsburgh.

Benjamin N. Ford of Cincinnati has been appointed receiver for the Templeton Coal Co. of Dolan, Harrison County, Ohio. His bond was fixed at $10,000.

John L. Kemmerer, secretary and treasurer of the Kemmerer Coal Co., accompanied by his wife, has gone on a hunting trip for big game in the Fall River Basin of Wyoming.

J. N. Sherer was recently appointed sales agent for the Producers Coke Co. at Uniontown, Penn., in place of Richard Peters, Jr., who recently became allied with the William J. Rainey interests.

Lot Jenkins of Martins Ferry, Ohio, has been promoted from custodian of the Ohio mine rescue car "Buckeye," to mine inspector of the eighth district. Mr. Jenkins' headquarters will be at Martins Ferry.

Albert L. Allen, assistant to the general manager of the New York State Workmen's Insurance Fund, was recently elected assistant manager of the Pennsylvania fund, and instructed to start work on forms, schedules and other preliminaries.

Walter Peterson has been appointed as sales agent of the Susquehanna Coal Co. with headquarters at No. 1 Broadway, New York City. Mr. Peterson succeeds George H. Bressette, who resigned after several years service. Mr. Peterson was formerly connected with the Staple Coal Co. and the Pittsburgh Coal Co. He is well known among the coal trade.

Lowther Ferris, formerly general sales agent of the Wellington-Comax Agency, Ltd. (Canadian Colliers, Dunsmuir, Ltd.) of Victoria, B. C., has organized and will become general manager of the Columbia River Coal Dock Co., of Portland, Ore. Large docks for coal storage and ship bunkering are to be erected at once on North Portland Harbor at North Portland, Ore.

Irving R. Gard has been appointed consulting engineer for the Columbia River Coal Dock Co., of Portland, Ore. He will design and superintend the construction of the coal bunkering and storage docks which this company will erect at once on the Columbia River near North Portland. The plant, when completed, will be the largest and most efficient in the Pacific Northwest.

Willis H. Brown has been chosen as vice-president of the Seiler-Blanchard Co., of No. 1 Broadway, New York City. He is well and favorably known among the coal trade in the eastern part of the country. Mr. Brown was for several years connected with the Skeele Coal Co., of 90 West St., both as general sales manager and as vice-president. The Seiler-Blanchard Co. will occupy larger quarters on the ninth floor of No. 1 Broadway in the near future.

Walter Schlagier, paymaster for a colliery near Wilkes-Barre, Penn., was waylaid by robbers, who took from him $1,100 in cash, besides valuable jewelry. The robbery took place near a stripping just beyond Keystone, to which point he had been escorted by state police as a matter of precaution. He had hardly traversed a half mile when he was assailed by four men and after being relieved of his valuables was wired to a tree. State police are scouring the territory and hopes are expressed that the culprits will soon be in custody. The paymaster was not injured in any way.

INDUSTRIAL NEWS

Denver, Colo.—The National Fuel Co. recently awarded a contract for a new wood tipple at the Shamrock mine to the Roberts & Schaefer Co. of Chicago.

Pittsburgh, Penn.—Five million tons of coal held up in the Kanawha River awaiting a favorable stage was recently started southward. The majority of the shipment was to Cincinnati.

Charleston, W. Va.—The Cabin Creek Consolidated Coal Co. has awarded a contract for a Marcus coal tipple equipment for installation at Kayford, W. Va. to the Roberts & Schaefer Co.

Wilkes-Barre, Penn.—A case involving approximately $2,500,000 was recently placed on trial before Judge H. A. Fuller. This suit is that of the Delaware, Lackawanna & Western R.R. against the Kingston Coal Co., and concerns the construction and execution of coal leases and mining contracts dating back to 1878.

New York, N. Y.—The Wolf Safety Lamp Co. of America, Inc., has removed from 49 West St., to 74-80 Washington St., New York City. The new factory, as well as the offices of the above company are now located at the Washington St. address. Lamps are now manufactured complete at this address as well as all component parts thereof.

Bluefield, W. Va.—A special term of the Federal District Court to convene on Oct. 12, is scheduled to hear an ejectment suit of the Pocahontas Coal & Coke Co. against Milton Curtis and others. The question at issue, it is understood, is the matter of mineral rights. The case has been on the docket of the Federal Court for the past two years or more.

Winburne, Penn.—Messrs. Peale, Peacock & Kerr, of New York, recently awarded the contract for a two-track steel tipple with car haul for mine No. 9 at Winburne ,Penn., to the Roberts & Schaefer Co. of Chicago. They have also let a contract to the same company for a Marcus patent picking table screen for mine No. 24 of the Russell Coal Mining Co. of Russellville, Penn.

Fairmont, W. Va.—Condemnation proceedings by the Western Maryland R.R. Co. to secure rights of way for the construction of the Fairmount-Helens Run R.R. will be heard at a special session of the Circuit Court called for Oct. 8. Much trouble has been experienced by the Western Maryland in procuring rights of way, and as a result it is deemed necessary to resort to condemnation proceedings.

Philadelphia, Penn.—The Philadelphia & Reading Ry. Co. has advertised for sale the equipment of the barges "Tunnel Ridge" and 'Coleraine," which went ashore at Highland Light Apr. 3 last. The vessels are so hard and fast aground that it has been decided that it would be too expensive to float them and the decision was therefore made to sell all the fittings such as boilers, chains, spars and windlasses.

Huntington, W. Va.—Coal loadings on the Chesapeake & Ohio Ry. for the first 16 days of September, 1915, have increased more than 100,000 tons over loadings for the same period of a year ago. From Sept. 1 to 16 inclusive, 1,260,770 tons of coal were loaded on the Chesapeake & Ohio while during the same period last year only 1,139,180 tons were handled. This shows a difference in favor of 1915 of 121,590 tons.

Des Moines, Iowa—The State Mining Department of Iowa, as the first important step in an educational campaign throughout the state, installed a coal exhibit in the mines and mining building at the State Fair. It was endeavored by every means possible to impress upon visitors at the Fair the value of the mining industry of the state. Coal from more than 100 mines in 23 counties was shown, one lump weighing over 2,000 lb.

New Haven, Conn.—There has recently been formed an organization among graduates of Yale University known as the Yale Engineering Association. While any Yale graduate is eligible for membership, the Association naturally appeals most strongly to those engaged in engineering manufacturing or transportational pursuits. It is proposed to hold the first meeting of the Association in New Haven, Conn., the early part of November.

Baltimore, Md.—The Baltimore & Ohio R.R. has announced plans for a giant new coal pier in this city to supplement the present pier at Curtis Bay. The pier will cost approximately $1,500,000. It will have the most modern unloading machinery, so that all chutes can be used on one vessel or separately, with a shuttle and belt arrangement to prevent breakage. The capacity of the pier will be from 3,000 to 6,000 tons per hour according to the necessity for rapid loading.

Richmond, Mo.—The Pickering Coal Co. is arranging with the General Electric Co. for a motor generator set and a storage battery locomotive for use in its mine. This is said to be the first use of electricity for traction in the smaller mines of the district. The locomotive is of four tons capacity, equipped with iron-clad batteries of 300 ampere-hours capacity, from the Electric Storage Battery Co. of Philadelphia. Current will be bought from the local central station at Richmond, half a mile away, a line being extended for that purpose by the station. The line will carry alternating current, which will operate the generator set, producing direct current for the storage batteries.

Richmond, Va.—Affirming the decision of the District Court at Phillippi, W. Va., the United States Circuit Court of Appeals has decided that the Elk Coal Co. is entitled to possession of a tract of 1,000 acres in Randolph County, W. Va. This title was contested by George W. Snyder and others.

Youngstown, Ohio—The new byproduct coke oven plant, or addition to the plant, consisting of 75 ovens, being erected by the Republic Iron & Steel Co., will be completed about Nov. 1.

Coalwood, W. Va.—The Carter Coal Co. has authorized the Roberts & Schaefer Co. of Chicago to proceed with the building of a large Marcus patent coal tipple with "R. and S." loading booms, which was contracted for some months ago for the new mine recently sunk at Coalwood, and known as the Olga mine. This will be one of the largest installations in the state. The firm has also given the Roberts & Schaefer Co. a contract for a new wooden Marcus tipple for the Nora mine at Coalwood, W. Va.

Philadelphia, Penn.—On Oct. 1 the Goulds Manufacturing Co. of Seneca Falls, N. Y., will open a Philadelphia office at 111 N. Third St. It purchased the business of H. E. Trotman, who up to the present time has been distributor for Goulds pumps in this territory, and has leased from him the storeroom and warehouse at the above address. E. S. Jenison, formerly with the Canadian Fairbanks-Morse Co., Ltd., Montreal, has been appointed manager and F. G. Kramer, formerly in the employ of H. E. Trotman, will be assistant manager. J. B. Trotman will continue with the Goulds Manufacturing Co.

Louisville, Ky.—The Louisville & Nashville R.R. Co. has announced forthcoming changes in the operation of certain of its lines in central and eastern Kentucky, which are of much importance to the coal operators in the Jenkins section. The changes will be effective Oct. 1. They will include consolidation of the old Louisville & Atlantic division from Frankfort to Beattyville Junction with the eastern end of the Lexington & Eastern division, from Maloney to Jenkins, a distance of about 240 miles. This will form one of the longest divisions of the L. & N. in the state. The section of the L. & E. from Lexington to Maloney will be joined with the Kentucky Central division and directed from the office at Paris. The general offices which have been located at Lexington will be abolished and the force divided between Paris and Irvine. The proposed changes will call for new train schedules on all the lines involved and these will be put into effect shortly.

Uniontown, Penn.—Fayette County coke to England is the latest word in export circles, and although the tonnage being shipped from the ports of Baltimore and Philadelphia at present is not as large as that to some of the other countries, the way has been blazed for future orders it is believed and a steady stream of trade to the British Isles, at least during the European hostilities, is looked for. The word of a prominent coke producer is that although the Connellsville operators sell to the exporters on the Atlantic Coast, they would rather see their product go to some country that is not engaged in the European war, and instead of being emergency suppliers, lay the foundations for a healthy export trade. South America does not use much standard coke, but the tonnage of coal and coke to points south has materially increased during the past two months and before the winter is over a line of trade should have been established between here and Argentina, Chile, Bolivia and other countries of South America that should have lasting results.

Uniontown, Penn.—With coke bringing $2.25 a ton, numerous independent plants throughout the Connellsville-Klondike region are making plans to reach a maximum output by Oct. 1. The Aetna Connellsville Coke Co., which has 70 ovens burning at present, will increase its production gradually until the entire plant is working at capacity. Thompson-Connellsville No. 1 is working full with all of its 400 ovens fired and 450 men employed. Sometime between Sept. 20 and Oct. 1, 200 of the 400 ovens at Thompson-Connellsville No. 2 plant will be fired. At present a large force of men is engaged in cleaning up the plant in anticipation of a resumption. Three hundred ovens are in operation at Tower Hill No. 1 and between 100 and 150 of the 400 at No. 2 plant will be fired shortly. This company is aiming to reach a maximum output as soon as possible. The Waltersburg Coal & Coke Co. is advertising for men preparatory to resuming operations and firing 150 additional ovens. It is not known when the increase in production will become effective but it is said the company expects to have work for 150 to 175 men by the first of October.

Coal Trade Reviews

General Review

Hot weather causes a collapse in the anthracite market. Bituminous continues to improve slowly. Shortage of vessels causes a heavy slump in exports. Car and labor supply becoming important factors.

Anthracite—There has been a general collapse in the hard coal trade as a result of the unprecedented high temperatures. Dealers are slashing prices in an endeavor to force business, and the situation is fully as adverse as any time during the summer. Ordinarily the anthracite business begins to tone up at about this time, and it is most unusual to encounter a purely weather market at this period. The one encouraging factor in the situation is the fact that there is sure to be a sharp rush for coal with the first appearance of lower temperatures. At the moment stove coal is the only grade commanding the full circular price, with egg next, and fairly well maintained at close to the company prices. Pea and chestnut are at a complete standstill and the steam grades are weak, though showing indications of doing better.

Bituminous—The soft coal trade continues its quiet course toward better conditions, the improvement being slow but satisfactory. No important price recessions are noted as a result of the extremely hot weather, the general tendency being to mark time pending further developments. Occasional orders are even appearing without solicitation, which indicates that the small manufacturers are beginning to resume operations. While the coal car supply has so far continued adequate, reports of occasional shortages in isolated districts are creating no little concern over the future outlook. On the better grade fuels the demand is active, with prices firm.

Exports—The foreign trade has been greatly handicapped during the past week by the scarcity of vessel tonnage. As a result, the movement has shown a sharp decline, while accumulations at the loading piers are excessive, particularly at Hampton Roads, where a large tonnage is awaiting arrival of vessels. The movement out of Baltimore for the current week has been the lightest for a number of months, and the present indications are that the September dumping at Hampton Roads will be somewhat less than for last month. Vessel rates are stiffer, due in part to the beginning of the grain movement, and a continuation of the high freights and a paucity of vessels will restrict the offshore movement to a substantially less volume than has been anticipated.

Lake Markets—Hot and unseasonable weather does not often affect the bituminous trade appreciably, but the temperatures have been so extremely high that there has been a sympathetic relapse in this branch, together with the anthracite market. However, the delayed buying, resulting from the present temporary apathy, will ultimately result in an even greater activity with the advent of more seasonable temperature conditions. In the meantime prices are relatively steady at figures slightly above the low summer level, the railroad consumption continues to increase, and the requirements of the iron and steel industry in the Pittsburgh district remain at the maximum rate. While no important shortage of cars is yet apparent, the situation in this respect is notably different from a few months ago. A congestion of grain is reported in the West and the railroads are rushing all available equipment in that direction.

Middle West—The domestic market has been well sustained, notwithstanding the excessively hot weather. Temperature conditions have been more favorable toward the Northwest, which, combined with the advance in freight rates effective Oct. 1, has shaken out quite a number of unexpected orders. A satisfactory volume of orders is coming in from the country dealers. The car-supply question is steadily becoming a more important factor in the situation ,especially where operators are particular regarding the kind of equipment; increased tonnage, the heavy grain movement and a shortage of motive power are the chief difficulties.

A Year Ago—Heavy demand for anthracite continues unabated. Bituminous slowed down still further and the outlook is now most discouraging. Lake shipments for the season show a big loss. Middle Western steam fuel given away for freight charges.

BUSINESS OPINIONS

Iron Age—Export business is more distinctly the dominant factor in the steel trade than in any previous month of the war. Foreign rather than domestic demand caused an advance of $2 a ton in wire products on Saturday, and in the past week the inquiry for steel rounds and for billets and blooms from Canadian makers of munitions and from France has been on a scale well-nigh incredible. As a whole the market is moving upward, not uniformly nor yet with any spectacular developments, but in response to the special influences that have produced a scarcity of steel.

American Wool and Cotton Reporter—The last week has been quiet but firm. It would seem as if manufacturers were pretty well supplied with wools, and are working on what they have before they make new purchases. Considerable comment is made in regard to the method England is employing in retaining wools which have already been bid on and paid for by American purchasers. The woolen goods market is generally in a favorable condition. War orders have been more profitable than expected. They have kept looms in operation which otherwise would have been idle, and have kept up prices of domestic goods.

Financial Chronicle—Contracts arranged for building operations in 159 cities of the United States during August totaled $70,333,787, as compared with $64,039,053 during the same month of last year. The figures for the first eight months of the current year are the smallest for any year since 1908, the approximate figures for the past three years being $536 million for the current year, $584 million last year and $666 million in 1912, this latter being the high record for this period.

Bradstreet—The week's reports spell progress in agriculture, finance, trade and industry. Much-needed warm weather has given an impetus to the maturing of the large corn crop, winter-wheat threshing has been facilitated, spring wheat has begun to pour into the markets, and export trade in grain and cotton has expanded. In financial lines, while prices for securities continue to mark time, the pushing of negotiations for a large foreign loan here have righted the foreign exchange market and stiffened prices of farm products, the export of wheat and cotton being thereby facilitated. Despite excessive heat which tends to hold back retail demand for fall, jobbing trade shows expansion at most centers.

Dun—Oppressive heat checked trade activities in numerous directions, but this is a temporary drawback and is more than offset by the benefit accruing to the maturing crops. For the present, cross-currents appear in commercial channels, with the diplomatic complications continuing to cause hesitancy in forward undertakings. Hence, there is less of the anticipatory buying that usually follows the assurance of bountiful harvests, but general trade has made a substantial recovery from the previous depression and the fundamental situation is so sound that a permanent check to the advance is unlikely.

Marshall Field & Co.—Current wholesale shipments of dry goods show some increase over the corresponding week a year ago, and sales are about even with those of the same period. Fewer merchants have visited the market, and collections are slightly below normal. The staple domestics cotton goods market is firm. The warm weather is giving retailers an opportunity to clean up their stocks of summer goods, but it is delaying the distribution of fall merchandise.

The Southern Lumberman—Fall business in yellow pine is opening up slowly but steadily. Southern mills with stocks well within the probable range of demand are holding up prices and announcing occasional advances on items on which they find stocks getting short. Western retail dealers continue to buy in small lots. Domestic demand for hardwood lumber continues to increase as the fall season advances. No radical changes in the market are detected from week to week.

ATLANTIC SEABOARD

BOSTON

The weather unfavorable to a firm market, but no change in prices. Competition from fuel oil begins to rouse interest. Georges Creek and Pennsylvania grades unchanged. Freights easy and anthracite demand subject to the weather.

Bituminous—The extremely hot weather was not favorable to any strengthening of the market. No recession in prices has been noticed, however, and generally Pocahontas and New River have marked time. The only spot business offering coastwise is for out of the way points and in such cases the transportation people are asking such rates as compared with those from Philadelphia that buyers are not much encouraged to take Southern coal. The export demand continues steady and gives every sign of being the mainstay of the market the rest of the season. More coal could be shipped off-shore were there more steamers to be had.

Shippers feel that with more seasonable weather there will be renewed interest in f.o.b. coal and that requisitions on contracts will improve in volume as fall comes on. At New England distributing points coal is in ample supply and prices correspondingly low. In fact, sales have been made within a week at as low a level as at any time this year.

There is a good deal of interest, especially in Portland and Providence, over the efforts of one of the large oil distributors to shift manufacturing plants from coal. The International Paper Co. is now being changed over to use oil at several of its plants; this concern uses 100,000 tons of bituminous a year at the plants in question so the matter is one of vital interest.

Georges Creek shows no material change. Shipments on contracts are coming through with regularity but shippers of this grade have the same difficulty as others in stirring up any buying interest in spot coal. Prices are held with all the firmness so characteristic of the Georges Creek operators.

The shippers of Pennsylvania grades are doing only hand-to-mouth business. The miners of the better coals have an amount of contract business that keeps them running on part time, but the general demand will have to improve materially before the market will receive any impetus. Prices for spot coal are still at the season's minimum, with only small advances for winter delivery. All-rail the market is sluggish, most consumers being stocked to capacity.

Water Freights continue about as last quoted; 75c.@80c. is asked for tonnage from Norfolk and Newport News to Boston. Rates from New York to Providence are slightly firmer, due to the protracted fog and slow movement of boats; $1 is the rate quoted from Hampton Roads to Bangor, Me.

Anthracite—Retail trade slacked off with the summer temperatures and wholesale inquiry has been light in consequence. The shipping companies are, however, fairly well supplied with orders. Broken is about the only domestic size that is at all short with any of the companies.

The market is quotable on the following basis per long ton:

	Philadelphia*	New York*	Baltimore*	F.o.b. Mines
Clearfields	$2.15@2.65	$2.45@2.95	....	$0.90@1.40
Cambrias and Somersets	2.40@2.90	2.70@3.20	....	1.15@1.65
Georges Creek	2.92@3.02	3.22@3.32	$2.85@2.95	1.67@1.77
Pocahontas and New River	....	....	2.80@2.85	....

* F.o.b. loading ports.

Pocahontas and New River prices on cars at Boston are $3.55@3.73 and at Providence $3.50@3.68.

NEW YORK

Unseasonable weather retards anthracite trade. Coal handlers strike causing delay in shipments. Mines working better. Bituminous shippers encouraged. Labor situation becomes serious. Export situation good.

Anthracite—Weather conditions continue to check the anthracite coal industry. In addition the market has felt the effects of the coal handlers strikes, although this was of short duration. Unseasonable temperatures of the past ten days have played havoc with the market. Demand at Tidewater has not increased and prices on individual prepared coals continue 25 to 35c. off the circular. The loading piers hold sufficient coal to satisfy present requirements, but the surplus on hand is not great.

The mines are working better than for many weeks and the surplus tonnage is being sent to the stock piles. Indications are that the operators are preparing for a long suspension in the spring. Reports of the line trade from the West and South are encouraging, and demand from Northern points show signs of becoming stronger. This is especially true of the New England States where comparatively little winter supply has been accumulated. Considerable hard coal is being shipped by vessel to Canada, Custom House reports showing shipments during the past several weeks of 52,870 gross tons.

Little change has taken place in the steam-coal situation. Barley and rice coals are short with most shippers and there is a better call for pea and No. 1 buckwheat.

Current quotations on anthracite, gross tons, f.o.b. at Tidewater, are:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$5.05		$5.10	
Egg	5.30	$4.80@5.30	5.35	$4.90@5.35
Stove	5.30	4.80@5.30	5.35	4.90@5.35
Chestnut	5.55	5.00@5.55	5.60	5.10@5.60
Pea	3.50	3.25@3.50	3.55	3.50@3.55
Buckwheat	2.75	2.25@2.75	2.80	2.25@2.80
Rice	2.25	1.75@2.25	2.30	2.00@2.30
Barley	1.75	1.45@1.75	1.80	1.75@1.80

Bituminous—A better feeling exists in the bituminous coal market. The labor question is assuming serious proportions and is likely to cause much trouble when it is necessary to increase production. The railroads continue to take large tonnages for storage purposes, in anticipation of labor troubles in the spring, when the working agreements in both the bituminous and anthracite regions expire. This increased demand has caused some of the favored operators to go on better working schedules.

There is a feeling of confidence in the export situation. Vessels remain scarce and carrying charges are stiff while many new inquiries are being received and reports of prospective orders are numerous. The demand for coke is also occupying a prominent position in the export trade.

Current quotations per gross ton at tidewater, f.o.b. are:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.20@3.30	$3.20@3.30	$3.20@3.30	$1.75@1.85
Georges Creek Tyson	2.90@3.00	2.90@3.00	2.90@3.00	1.35@1.45
Clearfield:				
Medium	2.65@2.80	2.55@2.65	....	1.10@1.25
Ordinary	2.55@2.60	2.55@2.60	....	1.00@1.15
Broad Top Mountain	....	....	....	1.10@1.45
Cambria County:				
South Forks	2.90@3.05	....	....	1.35@1.50
Nanty Glo	2.75@2.80	....	....	1.20@1.25
Barnesboro	2.65@2.70	....	....	1.10@1.15
Somerset County:				
Quemahoning	....	2.70@2.85	2.70@2.85	1.20@1.30
Medium	2.65@2.70	2.60@2.65	2.60@2.65	1.10@1.15
Latrobe	2.45@2.55	....	....	.90@1.00
Greensburg	2.75@2.80	....	....	1.10@1.15
Westmoreland	3.15@3.20	....	....	1.35@1.45
West Virginia Fairmont ¾		2.60@2.70	2.60@2.70	.80@ .90
Fairmont mine-run	....	2.45@2.55	2.45@2.55	.75@ .85
Steam	....	2.45@2.50	2.45@2.50	.90@ .95
Western Maryland	....	2.35@2.40	2.35@2.40	.85@ .90

PHILADELPHIA

Continuation of heat wave unsettles the anthracite market badly. Stove coal most active. Chestnut and pea badly off circular. Buckwheat fair but other steam sizes dull. Quite an improvement continues in bituminous, with prospect of better prices. Export trade good.

Anthracite—With the temperature reaching 90° or over for seven consecutive days the coal business has suffered an utter collapse. Ordinarily when mid-September arrives things begin to move with some briskness, but as a result of the extraordinary weather conditions the trade has been as dull as the worst week in July or August. Of course this means restricted mining and several of the big companies have already made announcements to this effect. On the other hand coal is sure to go out with a rush the moment the first seasonable weather arrives which must be soon. It is also noted that dealers who supply the steam trade are enjoying good business and it seems to be picking up right along.

A number of dealers in domestic coals, in their anxiety for business, have cut retail prices so badly that the effort to get what little business there is has practically resulted in a scramble. There have been advertisements quoting prices on pea coal which is now almost exclusively a family coal, delivered in the cellars at from $4.50 to $5.25. As it now stands many dealers are apparently going to give the public the margin they saved this summer in buying.

Of the several sizes, the most active in the wholesale market is stove coal and there is no reason to doubt that this size is bringing anything but the full circular price. Next in demand is egg with the full price fairly well maintained, although there is an occasional exception here and there, with sales made without tax or from 5 to 10c. off. Chestnut continues weak as usual, with large quantities being stored and what is sold generally sacrificed. Pea coal, which had a good start during the last few days of August and first days of September, is at a standstill, due to the fact that most dealers are holding up their orders. Sales of the finer grades have been made at $1.85 and in a very few instances at $2 and the tax, but absolutely nothing higher. An occasional instance has been noted where this grade was offered at $1.65, but certainly not the first-class article.

The steam sizes, buckwheat, rice and barley, with the exception of the first named, are not moving very well. However, buckwheat seems in fair demand and with prospects of doing still better, as the mills in this district are going on full time. The other two sizes are being heavily stored.

The circular prices, to which the Pennsylvania State tax of 2½% per ton should be added, are as follows:

	Line	Tide		Line	Tide
Broken	$3.50	$4.75	Pea	$2.50	$3.25
Egg	3.75	5.00	Buckwheat	1.25	2.25
Stove	4.00	5.00	Rice	.85	1.75
Chestnut	4.15	5.25	Barley	.50	1.50

Bituminous—The trade continues its quiet trend toward improvement. The gain is slow to be sure, but none the less satisfactory. Wholesale offices are receiving orders now and then without solicitation, which shows that the small manufacturer is getting under way in response to the generally improved business conditions. The car supply continues generally satisfactory and the cause for anxiety at the moment seems to be in the labor supply, although time may show that even this is perhaps somewhat exaggerated. The export business continues even more active, shipments and inquiries both being in good volume. Vessel tonnage remains scarce, with the prospect of continuing so for an indefinite period. Freights, too, are closely held.

There has been no appreciable change in prices during the week and while the list below is a fair basis, there is no doubt that a change all along the line in imminent:

Georges Creek Big Vein	$1.65@1.75	Fairmont gas, ¾	$1.20@1.30
South Fork Miller Vein	1.50@1.60	Fairmont gas, mine-run	1.05@1.15
Clearfield (ordinary)	1.00@1.20	Fairmont gas, slack	.70@ .80
Somerset (ordinary)	1.00@1.15	Fairmont lump, ordinary	.90@1.00
West Va. Freeport	.85@ .95	Fairmont mine-run	.85@ .90
		Fairmont slack	.60@ .70

BALTIMORE

Export movement hampered by lack of vessels. Scarcity of cars in Fairmont and Somerset regions. Market for bituminous steady.

The export movement has fallen off sharply due to lack of vessels. Only eight vessels were loaded here for foreign account last week, and only five charters were announced. During the week ending Sept. 18 only 19,981 tons was loaded here for foreign account, the smallest amount for some months past.

Car scarcity was felt severely last week in both the Fairmont and Somerset districts. The Somerset region reported about a three-fourths of requirements while the Fairmont region did not have more than a two-thirds supply. The market on bituminous grades is firm and some of the better qualities show slight increases in price.

The anthracite trade here is only fair. There is much talk from dealer to consumer about possible strike troubles in the spring, but as yet this bears but little fruit. Cooler weather has arrived and strengthened the market.

HAMPTON ROADS

Weeks shipments fair. Government takes some coal by collier. Prices remain unchanged. September movement light.

While the dumpings over the Tidewater piers may not have been as heavy as expected, they have shown up fair. Export shipments have moved principally to Italian and South American ports. Italy has taken the largest amount going to any one country. The shipments to South America have been divided among the various countries with the largest quantities going to Brazil and Argentine Republic.

Prices on all grades remain practically unchanged although there is a fairly large accumulation of coal at Tidewater. The large amount on hand is no doubt due to the fact that there are a number of vessels due whose cargoes have already arrived.

From the present outlook the indications are that the total movement from Hampton Roads for the month of September will hardly come up to August unless vessel tonnage should arrive faster than it has.

Railroad Tonnages—Dumpings over the local piers for the past five weeks compare as follows:

	Week Ending				
Railroad	Aug. 21	Aug. 28	Sept. 4	Sept. 11	Sept. 18
Norfolk & Western	172,546	211,699	232,394	156,459	182,047
Chesapeake & Ohio	129,826	103,472	82,485	93,260	87,680
Virginian	77,136	82,131	72,302	70,855	59,597
Totals	379,508	397,302	387,182	320,574	329,336

Ocean Charters, Clearances and Freights

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	To	Tons	Rate
Anne Lord	Moncton	246	1.70
J. H. Hoyt	Calais	394	1.30
J. Rothwell	Rockland	473	1.00
F. Brainard	Nantucket	198	1.00
Northern	Marseilles	2,912	
Linda Fell	Havana	1,924	
Kalliope	Pernambuco[1]	1,588	6.25
Socotra	Pernambuco[1]	1,604	6.25
Bris	Pernambuco[1]	972	6.25
Finland	Pernambuco[1]	1,590	6.25
Camino	San Fran.	3,308	
Orkild	Cuba	1,622	
W. Adams	Labucoa		4.00
Modiva	Guantanamo	778	
Moldegaard	Havana	1,788	

[1] Or Rio de Janeiro

BALTIMORE

Vessel	To	Tons	Rate
Osterland	Sweden	3,391	
Lysefjord	Sagua	597	
St. Gothard	Havana	1,790	
Liberstad	Martinique	571	
P. Maersk	Malmo	830	
H. S. Little	Point-a-Pitre	1,600	3.75
Thrasyvoulos[1]	Italy	2,296	10.20

VIRGINIA

Vessel	To	Tons	Rate
I. P. Justesen	Buenos Aires	1,183	7.92
Dowgate	La Plata	1,986	8.04
Thrasyvoulos[1]	Italy	2,296	10.20

ATLANTIC RANGE

Vessel	To	Tons	Rate
Stathatos	Italy	2,296	10.44

[1] Or Virginia.

VESSEL CLEARANCES

The following steamers have cleared during the week Sept. 10 to Sept. 17:

NORFOLK

Vessel	Destination	Tons
Wellington[1]	Guaymas	2,013
Ancon[2]	Canal Zone	9,500
Douglas[3]	Antafagasta	6,403
Hassel	Buenos Aires	5,003
R. W. Stevens	St. Michaels	1,636
Ocland[4]	Port of Spain	4,707
Tibagy[5]	Rio de Janeiro	3,270
Boden[6]	Stockholm	4,500
Denis[7]	Para	1,911
Achlibster[8]	Italy	6,107
Oceano[8]	Porto Ferrajo	5,750
A. M. Davenport[9]	Rio G. Du Sul	1,688
A. E. Bullard[9]	Pernambuco	2,086
Gemma[8]	Genoa	2,901
Dowgate[5]	La Plata	4,327
M. Goulandris[8]	Savona	5,145
Chiswick[9]	Barbadoes	4,607
Zaandijk[9]	Rotterdam	5,000
Lucy Neff[1]	St. Thomas	1,000
Atlantide[8]	Porto Ferrajo	7,600
Great City[8]	Genoa	8,900

NEWPORT NEWS

Vessel	Destination	Tons
Fructidor[10]	Spezia	6,000
Svend 2nd[9]	Havana	3,136
Etna[11]	Buenos Aires	7,350
Pennistone[11]	W. C. Italy	6,027
Fede[7]	Gib for orders	5,404
Berwindvale[11]	Havana	8,000

BALTIMORE

Vessel	Destination	Tons
Meisner	Italy	3,890
Lysefjord	Cuba	1,074
Libertad	Martinique	919
Osterland	Sweden	5,511
Maersk	Sweden	2,226
St. Gothard	Cuba	4,431
Peter Maersk	Sweden	1,930

[1] Hasler Bros. Inc. [2] W. C. Atwater & Co. [3] Barber & Co., Inc. [4] Baker Whiteley C. Co. [5] C. G. Blake Co. [6] H. N. Hartwell & Son. [7] C. & O. Coal & Coke Co. [8] Pocohontas Fuel Co. [9] Smokeless Fuel Co. [10] New River. [11] Berwind White.

NEW YORK*

Destination	Tons	Value	Destination	Tons	Value
Halifax	14,655	$74,483	Port William	480	$2,496
Sackville	475	2,423	Souries	326	1,718
Chatham	484	2,420	Barrington Passage	161	853
St. John	11,872	54,409	Freeport	253	1,283
Yarmouth	1,769	9,105	Arichat	200	1,043
Sydney	567	2,965	Weymouth	158	828
Kingsport	313	1,660	Westport	265	1,375
Bridgewater	778	3,147	St. Andrews	871	3,847
Windsor	668	3,432	Digby	474	2,389
Campbelltown	1,763	8,643	Montague	484	2,503
Charlottetown	5,186	25,949	Fredericton	328	1,775
Bathurst	582	2,029	Dorchester	472	2,366
Bridgetown	215	1,084	St. Pierre	401	1,969
Annapolis	733	3,674	North Sydney	332	1,812
Paspebiac	465	2,429	Point du Cheue	411	2,147
Checontimi	1,850	9,925	St. Stephen	555	3,750
Manzanillo	704	2,464	Wolfville	501	2,575
Lunenburg	688	3,490	Dartmouth	604	1,676
Cardigan	199	1,062	Summerside	1,226	5,460
Liverpool	401	2,125			

* Includes figures for several weeks.

OCEAN FREIGHTS

The freight market is firmer than a week ago, owing to the absorption of steamers for the grain trade, and the amount of available tonnage has also decreased. A number of steamers were chartered during the past week at $7.92@8.04 on coal to Lower Plate ports, but these fixtures were undoubtedly at less than the market. It is reported today that a steamer has been closed at $10.44 to West Italy, which is a little higher than recent charters for this destination. West Indian and Cuban rates are also firmer. We would quote freight rates **on coal** by steamer as follows:

To	Rate	To	Rate
Havana	$2.50@2.75	Bermuda	**$3.00**
Cardenas or Sagua	2.75@3.50	**Vera Cruz**	3.50@3.75
Cienfuegos	3.25@3.50	Tampico	3.50@3.75
Port au Spain, **Trinidad**	**3.75**	Rio	8.16
St. Lucia	3.50@3.75	Santos	8.16@8.40
St. Thomas	3.00@3.25	Montevideo	8.04@8.16
Barbados	**3.75**	Buenos Aires or **La Plata**	**8.16**
Kingston	2.75@3.25	Rosario	**8.40**
Curacao	3.25	**West Coast of Italy**	10.32@10.56
Santiago	2.75@3.25	Barcelona	9.60@ 9.84
Guantanamo	2.75@3.25	**Valparaiso or Callao**	7.25@ 7.50
Demerara	5.00@5.50	Marseilles	9.84@10.08

Note—Rates noted in **bold face** type are only approximate.

LAKE MARKETS

PITTSBURGH

Unseasonably hot weather disappearing. Demand improved. Prices firmer. Operations at close to 70 per cent. Occasional slight car shortages.

The apathy in the retail coal trade as a result of the recent unseasonably hot weather is likely to yield to a condition of greater activity as the season advances. The consumption of domestic coal is, of course, still at the summer rate but more buying by retail dealers is expected. The iron and steel industry continues to operate at full capacity and as the weather improves tonnage outputs are increasing, involving the use of somewhat more coal. The railroad consumption also continues to increase.

The general tendency in coal prices is toward a greater stiffness and on occasional lots of Lake coal sold in the past few days better prices have been obtained than early in the season. The Lake movement, however, while heavier, is still confined almost entirely to operations by shippers who have their regular contracts, or mines of their own.

Occasional shortages of cars are now being reported by some of the mines. There have been no serious shortages but conditions are noticeably different from those of a couple of months ago, when there were ample supplies on all divisions.

Mining operations in the Pittsburgh district are now at close to 70% of capacity. Prices for free coal are strictly held at the following figures as minimum: Slack, 50@60c.; nut and slack, 90@95c.; nut, 95c.@$1; mine-run, $1.05; ¾-in., $1.15; 1¼-in., $1.25, per net ton at mine, Pittsburgh district. On contract to Apr. 1 the market is firm at 85@95c. for slack, $1.15@1.20 for mine-run, $1.25@1.30 for ¾-in. and $1.35@1.40 for 1¼-in.

BUFFALO

Bituminous trade suffers from the hot weather. No further improvement looked for till the temperature is lower. Anthracite dull. Lake shipments light.

Bituminous—There will not be much business till the effects of the hot weather over the first half of the month are overcome. There is scarcely a shipper who does not report the market flat for the time being. It is not likely that there will be a permanent slump, but there will will be no snap until colder weather appears. Prices are 5 or 10c. higher than they were in midsummer, which means something when they have been at the bottom so long.

There is quite an increase in mining, but the outlook is not good for any further increase till the real autumn weather sets in. It is quite possible that it may be close to November before the market resumes a stable firmness. Quotations on bituminous are weaker on the basis of $2.65 for best Pittsburgh lump, $2.50 for three-quarter, $2.49 for mine-run and $2.05 for slack. Allegheny Valley sizes are still about 25c. lower than Pittsburgh. All slack coal is about on a par and much stronger than formerly.

Anthracite—The market continues quiet. It was expected that there would be a healthy demand early this month, but this has not been realized. The fall trade will no doubt go over to October, unless there is some steady cool weather soon. The city trade is about as slack as at any time during the summer. The rail line trade is not heavy yet and Lake shipments for the week were only 85,000 tons. There are reports that Western consumers are buying coal as they bring in their grain, but the effect has not yet been noticed here to any extent.

COLUMBUS

Brisk demand for domestic sizes continues. Steam business also active and price lists well maintained. Mining operations show a decided increase.

The coal trade has been showing improvement all along the line. Domestic buying is brisk, despite the continued warm weather, and dealers are placing orders for immediate shipment.

Retail trade is active both in the city and rural sections. Farmers are now hauling their winter's supply of fuel, while householders in the cities and towns are also laying in their supplies and there is considerable school contracting going on. Public institutions are in the market for their coal supply and there is a generally healthier tone to the trade. Retail prices are well maintained and there is considerable talk of an advance about Oct. 1.

Steam business is rather active as manufacturing continues to improve. Railroads are taking more fuel for their freight movement and in addition are storing up large quantities against possible emergencies. Contracting is not active at this time as few contracts are expiring. There is not much demurrage coal offered on the local market. Steam prices are much firmer than formerly with the exception of the small sizes which are weaker.

Lake trade is still quite active and a considerable tonnage is being shipped to the Northwest. The dock situation at the upper Lake ports has improved. The Toledo docks of the Hocking Valley loaded approximately 73,000 tons during the past week.

In retail circles there is a good demand for Pocahontas and West Virginia splints. White ash is also moving well. Anthracite is in better demand than ever in central Ohio territory. The coke market is becoming firmer as the season advances.

Prices in Ohio fields are as follows:

	Hocking	Pomeroy	Eastern Ohio	Kanawha
Re-screened lump	$1.50	$1.50		
Inch and a quarter	1.40	1.40	$1.30	$1.30
Three-quarter inch	1.25	1.25		1.25
Nut	1.15	1.25		1.15
Mine-run	1.05	1.10	1.00	1.05
Nut, pea and slack	.60	.65	.50	.60
Coarse slack	.50	.55	.40	.50

Mines have been working at about the following percentages of full capacity:

District	Week Ended				District	Week Ended			
	Aug. 28	Sept. 4	Sept. 11	Sept. 18		Aug. 28	Sept. 4	Sept. 11	Sept. 18
Hocking	35	45	40	45	Cambridge	35	40	44	45
Jackson	20	20	25	25	Massillon	50	40	40	45
Pomeroy	45	50	50	60	Eastern O.	55	60	60	70
Crooksville	30	35	35	40					
					Average	34	41	42	47

CLEVELAND

The market is stronger at the prevailing prices, but no advances have been reported this week. Lake shipments heavy.

There is a marked strength in the trade, due very largely to the higher prices being asked by some operators. Quotations are being made by a number of operators, although others have apparently withdrawn from the market, as they are quoting prices beyond the reach of the local jobbers. Shipments in the Lake trade are larger, but the local market is barely holding its own. This puts the jobbers in a rather difficult position. Until all operators quote higher prices the market here is not likely to change. It was assumed that a revival of Lake business would increase the supply of fine coal and prices would suffer, but this has not been the case, as fine coal is verging on an advance of 5c. per ton.

Lake shipments are as large as operators are able to make. The all-rail demand is holding the Lake movement back and probably will until well into next month. As it is the operators and shippers who have contracts are having some difficulty in arranging for vessels. Grain rates are the highest they have been in years and vessel managers are declining coal cargoes in order to save time and late shipments of coal will cost the shippers heavily, as one-trip grain profits are equal to three or four trips with ore and coal.

Jobbers are buying at the following prices:

	Pocahontas	Youghiogheny	Fairmont	Bergholz	Ohio No. 8
Lump	$3.70			$2.30	
Lump, 6-in.				2.30	
Lump, 1¼-in.		$2.25		2.10	$2.15
Lump, ¾-in.		2.15@2.20	$2.00	2.00	1.95@2.00
Egg	3.70			1.95	
Mine run	2.70	2.10@2.15	1.90	1.85	1.85
Slack		1.65	1.65	1.55	1.60

DETROIT

Steam coal orders continue in good volume. Midsummer temperature slows down the domestic market. Lake movement meets new check.

Bituminous—Encouraging features are still developing in the local steam trade and business appears to be gradually expanding under a strengthening demand from consumers. Orders continue of small size, but the buying is regular. Some consumers are still obtaining coal on contracts made some time ago at prices materially below list quotations, and this is a retarding influence in growth of business.

Anthracite—Weather conditions have also placed a check on the anthracite business. Yards that were keeping a considerable force busy a week ago are now handling little business and orders to shipper are also less numerous.

Lake Trade—Lake shipments are not materially increased but the improvement in movement of other commodities is causing some vessel owners to reject coal cargoes, believing they can save sufficient time by going up light to more than compensate for the loss of freight on coal. It is quite probable all-rail shipments this season will be larger than usual.

TOLEDO

Toledo facing a car shortage. Coal movement light and no raise in anthracite the first of the month.

The one new feature of the coal situation here is the possibility of a car shortage. The Baltimore & Ohio has its agents canvassing the main line of the road in an effort to get freight cars unloaded and into Chicago at the earliest possible moment. It is stated that there is considerable grain congestion and the cars are needed there. The Pennsylvania has drawn all its surplus equipment into use and officers declare that freight traffic is extremely heavy. The New York Central has especially good equipment here, but its surplus stock is being reduced rapidly.

There was no increase in anthracite prices the first of September as is usually the case and chestnut coal is retailing at $7.85, with stove and egg at $7.60 per ton. The Lake movement is not heavy for this season of the year. A few contracts are occasionally made but they are for the most part small orders.

CINCINNATI

Warm weather has caused a let-up in domestic business. Better prices are promised, however, and prospects for improvement in the steam market are good.

The warmest weather of the summer has caused a sharp relapse in the growing domestic demand, which was not sufficiently strong to stand any setback. Prospects of an early fall forced some dealers into the market for larger stocks some time ago but the weather has caused a relapse into the waiting attitude. Price concessions, however, seem now to be confined to a comparatively few concerns. While the steam demand has not improved much, the relatively small production of nut and slack caused by the let-up in the domestic market has helped the steam grades considerably, resulting in a stiffening of prices. With indications of a car shortage it is predicted that the coal market is going to be a good deal stronger.

LOUISVILLE

Advancing season starting the coal moving in spite of the unseasonable weather.

With the season rapidly advancing to the point where retailers must lay in stocks, the movement in the Kentucky field is steadily increasing. Block sizes are in best demand, particularly for domestic purposes. Prices are showing some tendency to stiffen, though under the influence of the recent hot weather the edge has been taken off the market. A general improvement in business is forecasted. Jellico coals are selling about as follows, f.o.b. mines: Block, $1.65@1.75; block and lump, $1.55@1.65; round, $1.30@1.35; straight run-of-mines, $1.10@1.15; 6-in. run-of-mines, $1; nut and slack, 25@65c., according to character and quality. Some of the fancy coals exceed these prices largely while lower grades are correspondingly lower.

COKE

CONNELLSVILLE

Furnace coke contracting slow but buyers and sellers may soon get together. Prompt furnace coke stronger. Production and shipments heavier.

Apart from the few furnace-coke contracts recently made, buyers and sellers are finding difficulty in getting together, and there is no definite basis yet established for first-half contracts. A definite contracting movement, however, is believed to be not far off, as furnacemen are likely to be found ready to contract whenever they see that a definite trading market has been established. The early negotiations, as already reported, ran exclusively to sliding-scale contracts, based on pig-iron prices, but it has been difficult to arrive at a schedule which would be generally satisfactory and it now seems a distinct possibility that buyers and sellers will get together on a flat price after all.

In such an event the settling basis would probably be between $2.25 and $2.50. Recent contracts made include one for the whole of next year, based on $1.75 for coke if Eastern foundry pig iron is $14.50, with one-fifth as much advance for coke as for pig iron. Another contract was made, with a valley furnace not now in blast, for coke at $1.75 minimum on $12.75 basic iron and one-fifth as much advance in coke as in pig iron. This is a higher price basis than would have been done if the furnace were in operation and certain to continue. For deliveries late in the year sales have been made both at $2 and at $2.25.

Prompt furnace coke has stiffened slightly, the minimum of present offerings being $1.65. We quote: Prompt furnace, $1.65@1.70; furnace to Jan. 1, $2@2.25; prompt foundry, $2.30@2.60; contract foundry, $2.40@2.60, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Sept. 11 at 387,703 tons, an increase of 7,768 tons, and shipments at 388,862 tons, an increase of 8,231 tons.

Buffalo—The demand is good, though there is complaint that too many ovens have been started up. The oven capacity exceeds all possible consumption. The only time when the ovens would all be needed would be when consumers were buying more than they required for present use. Prices are somewhat weaker on the basis of $4.30 for best 72-hr. Connellsville foundry and $3.35 for stock coke.

Chicago—Coke is still buoyant. Quotations for future delivery indicate that sellers are looking forward to brisk demand with higher prices. All grades are active at the following prices: Byproduct foundry, $4.90@5.10; byproduct domestic, $4.75; Connellsville, $4.85@5; Wise County, $4.75@5; gas coke, $3.85@4.

MIDDLE WESTERN

GENERAL REVIEW

Warm weather slows up buying of domestic sizes. Smokeless grades dull. Screenings weaker. Anthracite moving in larger volume.

Notwithstanding the hot weather which has slowed up the demand for domestic coals, prices are generally well maintained. Orders for domestic sizes are still being received from the country in fair volume. Most Illinois and Indiana mines are oversold on domestic lump but some of the operations are long on egg and nut sizes, which are being sacrificed at low prices to move surplus accumulations at the mines.

Lack of car supply is becoming more pronounced. Small gondola cars are hard to obtain, and a number of mines have lately been obliged to shut down for a full shift until empties could be supplied. The railroads are having more or less trouble in handling both grain and coal which are now simultaneously moving to the markets. Delays are said to be due more to shortage of motive power than to lack of cars.

Screenings are now somewhat stronger but have suffered a decline of from 5c. to 10c. per ton from prices prevailing during the previous week; but even at present figures they are selling at double the prices received at the same time last year. Production is increasing in most of the Western mining districts. In Illinois it is estimated that the output is at 75% of normal and in Indiana 60%. It is difficult to estimate for Kentucky production on account of so many new operations but the output there is about 50% of normal. It is noticeable that some of the larger industrial plants are commencing to buy coal for storage purposes which is not expected to be used until after Apr. 1 . This, with the absorption of storage coal by the railroads, the approach of colder weather, and the shortage of cars and labor, and delayed movement on the part of railroads, makes the operator feel optimistic.

CHICAGO

Shipments to Northwest heavier. Indiana grades in better demand. Smokeless weak, while Hocking grades are stiffer and Kentucky coals are fluctuating over a wide range.

The situation in Southern Illinois is satisfactory and mines are operating nearly to capacity. In Franklin County domestic sizes are in strong demand; in Williamson County, while $1.75 is being received for the better known coals, the average price may be considered around $1.60. Screenings are easier, as well as other fine sizes, because of the increased output of domestic coal. Indications, however, point to improvement in the steam demand in this section. Shipments to Northwestern points are becoming heavier. The demand for Harrisburg steam lump during the past week has been very active, and improvement is shown in shipment of steam sizes from Saline County. Carterville lump has been very active, and egg and No. 1 washed continue steady at prices ranging from $1.60 to $1.75.

Steady buying of domestic lump has characterized the Springfield market and steam coals have also shown an improvement. Screenings are ranging from 50 to 60c., being slightly lower than last week.

Absorption of Indiana domestic coals is improving, but so far country dealers have not taken the amount received in previous years. ,Steel plants and allied industries are still backward in ordering coal. The demand for Sullivan and Green County lump has slumped somewhat, and 3d and 5th vein steam lump from the Clinton district has been very quiet. Sullivan County egg and nut are a drug on the market. Knox County steam coals are moving freely at higher prices and Clinton domestic demand is perceptibly stronger.

Smokeless lump and egg is firm at the list price of $2.25 in the country districts. Plenty of the prepared sizes seem to be on hand in Chicago, available for sale and absorption of these offerings occur at 10 and 15c. under circular figures. Pocahontas mine-run retains its strength and no free shipments are being made under $1.40. Quite a little contract mine-run has been moving at $1.25. On splint a wide range of prices still persists. Pennsylvania smokeless mine-run, lump and egg are in steady demand at about $2, while mine-run is being mainly sold at $1.25.

Stiffening in the price of Hocking domestic lump is observable. It is reported that $1.60 will be the circular price after Sept. 15.

Eastern Kentucky prices continue to cover a wide range. Millers Creek Block is in active demand at about $2.25, but other operators are not so fortunate. Screenings are plentiful and are sacrificed at low figures.

Anthracite is in fair demand. As a result of efforts of retailers to take care of their winter needs deliveries have been more rapid recently, and the market is absorbing offerings without trouble.

Quotations in the Chicago market are as follows:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump......	$1.60@1.75	$1.50@1.65	$1.50@1.60	$1.35@1.50	$1.40@1.50
Steam lump	1.35	1.25@1.35	1.20@1.30	1.20@1.30	1.20@1.30
2½ and 3-in. lump.....	....	....	1.35@1.45	....	1.25@1.35
1¼-in. lump.	....	1.25@1.35	1.25@1.35	1.15@1.25	....
Egg	1.60@1.75	1.50@1.65	1.10@1.20	1.05@1.15	1.15@1.25
Nut	....	1.50@1.60	.95@1.10	.90@1.05	1.00@1.05
No. 1 washed	1.60@1.75	....	1.50	....	....
No. 2 washed	1.35@1.40	....	1.40	....	....
No. 1 nut..	1.75	....	....	....	....
No. 2 nut..	1.40@1.50	....	....	....	....
Mine-run...	1.10@1.15	1.05@1.10	.85@1.00	.95@1.10	.85@1.05
Screenings..	.55@ .65	.50@ .60	.50@ .60	.55@ .65	.75@ .80

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump......	$1.50@1.75	$1.40@2.00	$2.10@2.25	$1.75@2.10	$1.50@1.60
1¼-in. lump.	1.30@1.35	....	....	1.25@1.35	1.25@1.35
Egg........	1.50@1.60	1.20@1.35	2.10@2.25	1.75@2.00	.85@ .95
Nut.......	1.25@1.35	1.15	1.60@1.70	1.25@1.40	....
No. 1 nut..	....	....	....	....	....
No. 2 nut..	....	....	....	....	....
Mine-run...	1.10@1.15	.90@1.00	1.25@1.40	1.10@1.25	.95@1.05
Screenings..	.60@ .70	.55@ .70	....	....	.50@ .60

ST. LOUIS

High temperatures slow down the buying. Prices holding steady except on screenings.

A belated spell of summer weather has made September seem like August and has checked the improved demand. There has been a falling off in the domestic orders which gave life to the market before the hot wave came. Householders are not worrying about getting their cellars filled for the winter.

Lump coal prices are being upheld firmly and the mines have plenty of orders on this size. Screenings have been much weaker, especially those coming from the inner group, which have been selling as low as 35 to 40c.

	Big Muddy	Frank Co.	Carterville	DuQuoin
8-in. lump..........	$2.30	....	....	....
4-in. lump..........	2.20	....	....	....
2½-in. lump..........	2.10	....	....	....
6-in. lump..........	....	$1.65@$1.75	$1.50@$1.60	$1.50
3x6-in. egg..........	....	1.60@ 1.75	1.40@ 1.50	1.40
No. 1 nut..........	....	1.50@ 1.75	....	1.20
No. 2 nut..........	....	1.40@ 1.50	....	....
No. 1 washed.......	....	....	1.65	....
No. 2 washed.......	....	....	1.25	....
No. 3 washed.......	....	....	1.25	....
No. 4 washed.......	....	....	1.20	....
No. 5 washed.......	....	....	.70	....
Screenings..........	1.00	....	.45@ .50	.45

Prices quoted above are f.o.b. mines. The rates from mines to St. Louis are: Big Muddy, 70c.; Franklin and Williamson County, 72½c.; DuQuoin, 62½c. East St. Louis rates are 25½c. per ton less. When destined beyond St. Louis the rate to East St. Louis is 40c. per ton.

INDIANAPOLIS

General improvement in mining operations in Indiana, due mainly to the advancing season. Prices unchanged, except for some weakening of slack.

The impetus due to the fall demand is being felt though the September weather has been anything but suggestive of the need of coal. There is always some accumulation against emergencies and part of this reserve stock is now being laid in. The acceleration of mine operations has resulted in increasing the supply of screenings and there has been some weakening of prices. Sales of Nos. 5 and 6 are reported as low as 60c., but the best No. 4 still commands 90c. No. 4 mine-run sells at $1.15@1.20 f.o.b. mine and domestic lump at $1.50.

Mines have been able to increase running schedules about one-third. There is some complaint about difficulty in getting sufficient gondola cars from the Monon, Pennsylvania and Illinois Central lines. There is a seasonable movement from retail yards and prices are unchanged. Dealers have been making as many contracts as possible at $2.75 a ton for Indiana domestic lump. Operators report some improvement in railroad buying.

DULUTH

Healthy increase in the shipments of bituminous coal features the market.

Bituminous—Dock companies are kept quite busy on rush orders from country dealers and the elevator companies for threshing purposes. All the dock companies and the railroads operating lines into the grain belts of the Northwest, report a large increase in business as compared with a year ago. That the present prices are likely to remain firm, with possibly an advance in the very near future, is the feeling among all of the companies at the present time. The light shipments of this season, together with an improvement in business conditions generally are factors that are likely to create a decidedly firmer tone. Quotations to dealers are as follows:

	Yough.	Hock.	Poca.	Splint	Ky. Elk.
Lump	$3.40	$3.40	$4.75	$3.40	$3.55
Dock-run	3.10	3.05	3.25	3.10	3.25
Screenings	2.40	2.25	2.75	2.40	2.55

Anthracite—In the anthracite trade buying has begun in a healthy way but it requires the actual starting of fires to make an impression on most consumers, hence no great rush is expected until cooler weather arrives. Quotations to dealers, f.o.b. cars at docks, Duluth are as follows: Egg and stove, $6.85; nut, $7.10; pea, $5.55.

PRODUCTION AND TRANSPORTATION STATISTICS

MIDDLE WESTERN ROADS

The following is a comparative statement of the coal handled over the 17 principal Middle Western railroads for July and the first 7 months of this year, as compared with the same periods last year:

	July		7 Months	
	1914	1915	1914	1915
Ill. Cent. R.R...............	577,766	550,237	3,984,115	3,996,740
C. & E. I. R.R...............	470,661	428,653	3,770,787	3,251,828
C. B. & Q. R.R...............	401,428	379,912	2,968,866	2,818,051
C. C. C. & St. L. Ry.........	381,001	374,728	2,624,310	2,739,157
Vandalia R.R...............	337,974	340,926	2,408,272	2,714,619
C. T. H. & S. E. Ry.........	225,536	210,978	1,708,798	1,707,846
C. & A. Ry.................	154,650	134,567	981,318	1,043,840
Wabash R.R................	117,318	114,298	786,922	869,380
St. L. & I. M. & S. Ry.......	118,791	132,701	821,661	834,083
Southern Ry................	102,161	85,143	903,287	616,769
B. & O. S. W. R.R...........	33,738	74,522	410,456	547,996
St. L. T. & E. R.R..........	51,811	39,965	358,334	330,967
St. L. & O. F. Ry...........	40,986	47,735	288,996	349,713
L. & M. Ry.................	22,031	22,382	252,992	264,995
C. I. & L. Ry...............	52,015	55,396	344,505	368,613
C. P. & St. L. Ry...........	16,647	28,515	192,554	232,107
C. & N. W. Ry...............	24,902	26,541	181,193	232,229
Total.....................	3,129,416	3,047,199	22,987,366	22,918,837

FOREIGN MARKETS

GREAT BRITAIN

Sept. 3—Business on the coal market is very quiet and the demand is slow, with prices in favor of buyers able to take prompt shipments. Normal quotations are as follows:

Bset Welsh steam.......	Nominal	Best Monmouthshires....	$5.76@6.00
Best seconds............	Nominal	Seconds................	5.28@5.52
Seconds................	$5.76@6.00	Best Cardiff smalls......	4.32@4.56
Best dry coals..........	5.76@6.00	Cargo smalls...........	2.64@2.88

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—Inquiries are fairly numerous, but many merchants are holding off in the hope of lowering rates. Rates are approximately as follows:

Gibraltar.........	$3.96	Naples..........	$7.44	St. Vincent.......	$4.32
Marseilles........	6.65	Alexandria.......	7.80	Rio de Janeiro....	5.04
Algiers...........	5.79	Port Said........	7.80	Monte Video.....	4.80
Genoa............	7.44	Las Palmas......	4.08	River Plate......	5.04

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

+Indicates contracts regarding which official information has been received.

Recast

In the following table we give a list of all old contracts coming up for consideration during the ensuing week. The table gives our contract number, the name of the purchaser, city, tonnage and page on which the detail notice appeared.

No.	Purchaser	City	State	Tonage	Page
1349	Board of Education	Ogden	Utah	1,400 b	411
1352	Security Stove Co.	Kansas City	Mo.	4[2]	411
1356	Municipal L. & W. Department	Storm Lake	Iowa		411
1358	Peter & Burghard S. Co.	Louisville	Ky.	40[2]	411
1,360	Bd. Pub. Works	Hannibal	Mo.	12,000b	411
1,361	Moline Rock Is. Co.	Davenport	Iowa	75,000b	411
1,368	St. Charles Hotel	New Orleans	La.	3,000	446
1,374	J. P. Nicholson	Erie	Penn.		446
1,381	Bd. Pub. Affairs	Chicago Junction	Ohio	2,500	446
1,382	Municipal W. & L. Plant	Birmingham	Ala.	1,920b	447
1,428	Board of Education	Massillon	Ohio		490
1,435	Canal B. Trust Co.	New Orleans	La.	150b	490
1,438	Interstate B. & Trust Co.	New Orleans	La.	200b	490
1,441	N. O. Cold Storage & W. Co.	New Orleans	La.	3,500b	490
1,443	Dakota Bakery Co.	Minto	N. D.	1 car[1]	490
1,447	Jacobs Candy Co.	New Orleans	La.	400b	490
1,449	Lisbon Sch. Dist.	Lisbon	N. D.	125b	490

a Indicates anthracite coal. b Indicates bituminous. [1] Per month. [2] Carloads.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

1043—Chicago, Ill.—It is understood that the L. A. Budlong Co. will not contract for their coal supply this season, but will confine their purchases to the open market as their requirements develop (p. 116). The company ordinarily uses Spot Logan splint and Red Jacket egg. Address Purchasing Agent, L. A. Budlong Co., Chicago, Ill.

+1270—Lake City, Minn.—This contract (p. 324), which provides for furnishing the Municipal Electric Light and Water Plant at this place with approximately 300 tons of coal, will not be entered into until a change in the weather conditions, the purchases being confined to the open market for the time being. The average price for Island Creek coal this year is about $3.65 as compared with $3.85 per ton f.o.b. Lake City, last year. Address Supt. M. J. Stowe, Municipal Elec. Lt. and Water Plant, Lake City, Minn.

1306—Billings, Mont.—This contract (p. 366), was last year awarded to the Kooi Coal Co. of Kooi, Wyo., but pressure is being brought to bear on members of the Board to let the contract to a Montana concern this season. The price at which the business was done last year was $2.80 per ton. Address Clk. A. J. Thorine, School Dist. No. 2, Yellowstone County, Billings, Mont.

1321—Plymouth, Ind.—Bids on this contract (p. 367), which provides for furnishing Marshall County with 280 tons of Pocahontas egg coal, will be received until Oct. 5 instead of Sept. 7 as previously announced. Address County Audr. G. F. McCoy, Plymouth, Ind.

1331—Fairpoint, Ohio—Bids have been received on this contract (p. 467), which provides for furnishing the Wheeling Township Board of Education with coal as follows: George E. Barnes, screened lump, 8c. per bu.; M. C. Huntsman, 7½c. per bu.; A. B. Conron, 7.95c. per bu.; S. S. Brokaw, 9c. per bu.; Wheeling Valley Coal Co., 7.85c. per bu. All bids were for screened lump with the exception of the last, which was for three-quarter lump. Address Clk. Addison Saffell, Bd. of Edu., Fairpoint, Ohio.

New Business

1451—New Orleans, La.—The Algiers Distilling Co. will be in the market during the early fall for their fuel requirements. Address Purchasing Agent, Algiers Distilling Co., Brooklyn Ave. and Mississippi Levee, Algiers, La.

1452—Sayreville, N. J.—The Board of Education at this place is requesting bids on 150 tons of egg and stove coal, and 25 tons of nut coal to be delivered at the various schools in the district. Address Dist. Clk. Frederick Werner, Bd. of Edu., Sayreville, N. J.

+1453—Trinidad, Colo.—The School Board of Dist. No. 1 will receive bids until Sept. 27 for furnishing approximately 700 tons of mine-run and slack coal. Address Secy. School Bd. Dist. No. 1, Trinidad, Colo.

+1454—Sharpsburg, Penn.—The Board of Education at this place will receive bids for furnishing lump and mine-run coal for the Locust Street School Building during the coming year. A previous request for bids from the Board of Education at this place was run under contract No. 1230, Vol. 8, p. 245. Address Secy. G. A. Speer, Bd. of Edu., Sharpsburg, Penn.

1455—New Orleans, La.—The Hotel De Soto will contract some time before Nov. 1 for its annual requirements of coal, amounting to about 120 tons per month. Address Gen. Mgr. Vic Le Beau, Hotel De Soto, Baronne and Poydras St., New Orleans, La.

+1456—Portsmouth, Ohio—The County Government will receive bids until noon, Oct. 11, for furnishing 5,000 bu. (80 lb. per bu.) of coal for use at the County Infirmary. The coal must run 60% lump, and deliveries are to be completed before Nov. 1 of this year. Quotations should be f.o.b. Portsmouth, Ohio. The successful bidder will be required to furnish a bond for 50% of the amount of the contract. Address County Audr. Thomas C. Patterson, Portsmouth, Ohio.

1457—Sharpsburg, Penn.—Sealed bids will be received for furnishing St. Mary's Church, School, Lyceum and Parsonage with coal as may be required. Address Rev. John Otten, 210 Penn St., Sharpsburg, Penn.

+1458—Davenport, Wash.—The Lincoln County Board of Commissioners will receive bids until 1 p.m, Oct. 5, for furnishing and delivering 50 tons of coal to the local Court House. Address Clk. J. E. Howard, Bd. of County Comrs., Davenport, Wash.

+1459—Hollidaysburg, Penn.—The Blair County Board of Directors received bids until 10 a.m., Sept. 22, for furnishing the County Home with the annual supply of coal, involving approximately 1,500 tons of bituminous. Quotations should be f.o.b. Spring Meadow siding, and deliveries are to be made as required. Address Secy. D. D. Coleman, Blair County Bd. of Comrs., Hollidaysburg, Penn.

+1460—La Moure, N. D.—The La Moure County Board of Commissioners will receive bids until 2 p.m., Oct. 5, for furnishing and delivering approximately 100 tons of Hocking Valley or Virginia splint coal to the County Court House as may be required during the ensuing year. Address County Audr. O. C. Temple, La Moure, N. D.

+1461—Albia, Iowa—The Independent School District at this place will receive bids until 5 p.m., Sept. 25, for furnishing the several buildings with coal during the coming school year. Address Secy. C. W. Smallwood, Independent School Dist., Albia, Iowa.

+1462—Wheelock, N. D.—The Adams School District No. 79 will receive bids until 6 p.m., Oct. 12, for furnishing the different school buildings with coal during the coming school year. Address Clk. R. E. Pepple, Adams School Dist. No. 79, Wheelock, N. D.

+1463—Little Falls, Minn.—The City Government will receive bids until Oct. 4 for furnishing approximately 50 tons of Youghiogheny coal, f.o.b. track at this place. A certified check for 10% of the amount of the bids must accompany each proposal. Address City Clk. Victor Schallern, Little Falls, Minn.

1464—Santiago, Chile—The Compania de Gas is in the market for 10,000 tons of American gas coal running about 40% volatile matter. The coal must produce about 60% coke and not to exceed 6% ash. Deliveries are to be at Valparaiso, and the coal will be taken in two shipments. Address Purchasing Agent, Compania de Gas, Santiago, Chile.

+1465—Selby, S. D.—Bids will be received until 2 p.m., Oct. 5, for furnishing and delivering coal in carload lots to the local Court House. Address Audr. W. E. Hoffman, Selby, S. D.

+1466—Bismarck, N. D.—Sealed bids will be received until 3 p.m., Oct. 5, for furnishing and delivering approximately 200 tons of the best lignite lump coal in the bins at the County Court House. Each bid must be accompanied by a certified check for 5% of the amount involved. Address County Audr. T. E. Flaherty, Bismarck, N. D.

+1467—Highmore, S. D.—The Hyde County Commissioners will receive bids for furnishing and delivering 75 tons of coal to the County Court House. Bids must specify the units per ton and must be accompanied by a certified check for $200. Address Audr. L. W. Carter, Hyde County, Highmore, S. D.

+1468—Wheeling, W. Va.—The Board of Education of the Triadelphia District received bids until 6 p.m., Sept. 22, for furnishing and delivering coal for about 10 different schools of the district. Some coke will also be required. Address Secy. S. S. Jacob, Jr., Bd. of Edu., Triadelphia District, Wheeling, W. Va.

+1469—Warren, Minn.—The Marshall County Board of Commissioners will receive bids until 2 p.m., Sept. 27, for furnishing and delivering 125 tons of Youghiogheny screened lump coal and 30 tons of anthracite. Address Audr. A. G. Lundgrem, Warren, Minn.

+1470—Minnewaukan, N. D.—The Benson County Board of Commissioners will receive bids until 2 p.m., Oct. 5, for furnishing and delivering 150 tons of lignite coal to the County Court House. All bids must be accompanied by a certified check for 5% of the amount bid. Address Audr. W. E. Paulson, Benson County, Minnewaukan, N. D.

+1471—Ft. Worth, Tex.—Bids will be received by the Tarrant County Orphans Home for furnishing one carload of McAlester mine-run, domestic nut, chestnut or pea and slack coal, to be delivered at the Home on the Ft. Worth-Dallas Interurban line. The bids will be received until 10 a.m., Sept. 27. Address Audr. J. A. Mulholland, Tarrant County, Ft. Worth, Tex.

+1472—Alpena, Mich.—The Board of Education will receive bids until 4:30 p.m., Oct. 15, for furnishing and delivering Pittsburgh lump coal to the city schools as required during the ensuing year. All bids must be accompanied by a guaranteed analysis. Address Alfred E. Ash, Alpena Bd. of Edu., Alpena, Mich.

+1473—Centerville, S. D.—The Independent School District No. 2 received sealed bids until 8 p.m., Sept. 24, for furnishing coal f.o.b. Centerville, S. D., deliveries to be made in September or December. About 125 tons of the best grade 6-in. Sunday Creek, Hocking Valley, Illinois, Island Creek splint or Indiana block coal are required. Address Clk. Walter M. Gardner, Independent School Dist. No. 2, Centerville, S. D.

1474—Salt Lake City, Utah—The University of Utah will receive bids until 1 p.m., Sept. 28, for furnishing 1,500 tons of screened slack coal during the coming school year. Address University of Utah, Salt Lake City, Utah.

1475—Cincinnati, Ohio—The Hamilton County Board of Commissioners will receive bids until noon, Oct. 1, for furnishing approximately 1,500 tons of Pocahontas or New River mine-run coal for the Hamilton County Infirmary at Carthage. Quotations should be on mine-run coal f.o.b. Big Four tracks at Carthage, delivery to be as required by the superintendent during the year beginning October, 1915. Bids must be on blank forms which may be obtained on application, and must be accompanied by a bond for $300. Address Clk. Albert Reinhart, County Comrs. Office, Cincinnati, Ohio.

+1476—Cedar Grove, N. J.—The Essex County Hospital will receive bids until 2 p.m., Oct. 13, for furnishing approximately 10,000 tons of coal for the year beginning Nov. 1. Specifications may be obtained on application. All bids must be accompanied by a certified check for 5% of the amount of the bid, and also a certificate testifying that the bidder has complied with certain state provisions embodied in chapter 253 of the state laws. The successful bidder will be required to furnish a surety bond of 50% of the amount of the contract. Address Supt. George C. Bergen, Pur. Dept., Room 206, Court House, Newark, N. J.

+1477—Skillman, N. J.—The New Jersey State Village for Epileptics will receive bids until 1:30 p.m., Oct. 4, for furnishing its coal requirements during the ensuing year. All bids must be accompanied by certified check for 5% of the amount of the tender, and the successful bidder will be required to furnish a bond for not less than 50% of the gross amount involved. Address Supt. David S. Weeks, M. D., Skillman, N. J.

+1478—Jamesburg, N. J.—The New Jersey State Home for Boys will receive bids until 3 p.m., Oct. 5, for furnishing its coal requirements during the year beginning Nov. 1. All tenders must be accompanied by a certified check for at least 10% of the amount of the bid, and the successful bidder will be required to furnish a satisfactory bond for at least one-half of the gross amount involved in the contract. Quotations should include delivery at Lower Jamesburg. Address Supt. John C. Kalleen, State Home for Boys, Jamesburg, N. J.

+1479—Genoa, Italy—An inquiry has been received from a large Genoa importing concern for two cargoes (about 4,000 to 5,000 tons each) of New River or Pocahontas coal for immediate shipment. Address E. G. Long Co., 50 Church St., New York City.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

No. 1255.—Ft. Benton, Mont.—This contract (p. 323), which provides for furnishing school district No. 1 with approximately 200 tons of nut coal, has been awarded to **La Barre & Thompson** at $4 per ton, delivered in the basement of the schoolhouse. John Muir bid $4.10 per ton. The coal will be furnished from the mine of the Stainsby Latham Coal Co., Stockett, Mont. Address Clk. Ezra L. Crane, School Dist. No. 1, Ft. Benton, Mont.

No. 1257—Watertown, S. D.—This contract (p. 323), which provides for furnishing the Board of County Commissioners with approximately 90 tons of Pocahontas smokeless lump coal, has been awarded to the **Consumers Fuel & Ice Co.** at $6.75 per ton. Other bids were: Pacific Elevator Co., $7.25; Watertown Feed & Fuel Co., $7.20; Selsmer Grain & Coal Co., $7.15. Address County Audr. J. S. Johnson, Bd. of County Comrs., Watertown, S. D.

+No. 1258—St. Clairsville, Ohio—This contract (p. 199), which provides for furnishing the Belmont County Court with coal during the ensuing year, has been awarded to Fritz Relive, at $8 per 100 bu. Address County Audr. Emerson Campbell, St. Clairsville, Ohio.

1266—Wichita, Kan.—This contract (p. 324), which provides for furnishing the local Board of Commissioners with coal, has been awarded to the **Good-Hilliard Coal & Feed Co.** There were no other bidders for the business. Address County Clk., Wichita, Kan.

1268—Steele, N. D.—This contract (p. 324), which provides for furnishing Kidder County with approximately 140 tons of coal, has been awarded to **J. W. Gonsullus & Co.**, at $3.15 per ton. Address County Audr. J. C. McWhinney, Steel, N. D.

+1269—Council Bluffs, Iowa—This contract (p. 324), which provides for furnishing the locad schools with 1¼-in. lump from Montgomery County, Ill., has been awarded to the **Western Fuel Co.**, at $3.93 per ton. Other bids received on this business were: C. W. Bowyer Coal Co., $3.98; Fenlon-Wickham Coal Co., $4.07; Carbon Coal Co., $4.17. Address Secy. J. J. Hughes, Independent School Dist., Council Bluffs, Iowa.

+1271—Hastings, Neb.—This contract (p. 324), which provides for furnishing the Adams County Board of Commissioners with coal for the Court House during the year beginning Sept. 1, has been awarded to **Chris Hausen,** at $4.60 per ton for Weir City nut. J. H. Yosh Lumber Co. bid $4.72 for Weir City nut unscreened, Allyn & Bissell bid $4.64 for the same, $4.44 for mill and $4.27 for Rock Spring slack. Byers Lumber Co. bid $4.68 for Weir City nut and $4.30 for Rock Springs slack and the Hastings Fuel Co. bid $4.65 per ton for Weir City nut. Address County Clk. C. H. Hudson, Hastings, Neb.

+1279—Jamestown, N. D.—This contract (p. 324), which provides for furnishing the county government with 150 tons of deep-mined lignite coal and 20 tons of anthracite stove coal, has been awarded to the **Welles Thompson Co.,** at $8.25 for anthracite and to the **Washburn Lignite Coal Co.,** at $3.25 per ton for the lignite. Address County Audr. Andrew Blewitt, Jamestown, N. D.

+1286—Fargo, N. D.—This contract (p. 324), which provides for furnishing the Cass County Board of Commissioners with coal has been awarded to the **Good-Hillyard Coal Co.** at $4 per ton on shaft-mine bituminous lump and $3 for slack. Address H. M. Barrett, Bd. of County Comrs., Fargo, N. D.

No. 1287—Greensburg, Ind.—This contract (p. 324), which provides for furnishing the county commissioners with 75 to 100 tons of Youghiogheny coal, has been awarded to the **Garland Milling Co.** at $3.60 per ton. Address County Audr. L. W. Sans, Greensburg, Ind.

1284—Council Bluffs, Ia.—This contract (p. 324), which provides for furnishing the free public library of this city with coal during the ensuing season, has been awarded to the **Fenlon-Wickham Coal Co.** at $4.13 per ton. Address Librarian, Free Public Library, Council Bluffs, Ia.

+1288—Sioux City, Iowa—This contract (p. 325), which provides for furnishing the Public Library at this place with anthracite coal, has been awarded to the **H. E. Haakinson Co.** at $10.25 per ton. Other bids on this business were: L. G. Everist Coal Co., $10.45; Brawn Coal Co., $10.50; Barish Bros., $9.75, with $1 extra for delivery. Address Libn. Jeannette M. Drake, Pub. Lbry., Sioux City, Iowa.

+No. 1290—Ellendale, N. D.—This contract (p. 325), which provides for furnishing the Dickey County Board of Commissioners with approximately 200 tons of Youghiogheny mine-run coal, to be delivered at the court house, has been awarded to the **Ellendale Equity Co.** at $6.25 per ton. The Ellendale Grain & Produce Co. bid $6.30 per ton. Address County Audr. C. C. Misfeldt, Ellendale, N. D.

+1292—Larimore, N. D.—This contract (p. 325), which provides for furnishing the local board of education with approximately 100 tons of Youghiogheny coal has been awarded to **O. H. Phillips** at $6.80 per ton. Address Clk. F. W. Reinoehl, Bd. of Edu., Larimore, N. D.

+No. 1296—Alliance, Neb.—This contract (p. 325), which provides for furnishing the local school district with approximately 500 tons of lignite coal, has been awarded to **J. H. Vaughan & Son** at $4.30 per ton for nut and egg and $3.10 for nut and pea, both of the prices including cost of delivery. Address Secy. F. W. Harris, Alliance School Dist., Alliance, Neb.

+1305—Hubbard, Ohio—This contract (p. 366), which provides for furnishing the local Board of Education with 1¼-in. screened coal during the ensuing year, has been awarded to **J. N. Brewer & Son.** Address Clk. Clyde Smith, Bd. of Edu., Hubbard Village School Dist., Hubbard, Ohio.

+1309—Cedar Rapids, Iowa—This contract (p. 366), which provides for furnishing the City Government with coal, has been awarded as follows: **W. G. Block Co.,** 300 tons Fulton County, Illinois, lump coal, $3.36; **Russell Coal & Coke Co.,** 60 tons anthracite range coal, $9.20. Address City Clk. L. J. Storey, Cedar Rapids, Iowa.

+1310—Sidney, Ohio—This contract (p. 366), which provides for furnishing the local Water Works Department with coal during the year beginning Sept. 1, has been awarded to the **Southern Coal & Coke Co.,** Chattanooga, Tenn., at 90c. per ton for mine-run coal. Address Dir. C. B. DeWeese, Dept. of Pub. Service, Sidney, Ohio.

1312—Montevideo, Minn.—This contract (p. 367), which provides for furnishing Chippewa County with coal, has been awarded to the **Montevideo Fuel & Ice Co.** for $5.95 per ton for Youghiogheny lump coal. Address Audr. J. J. Stennes, Montevideo, Minn.

+1315—Keytesville, Mo.—This contract (p. 367), which provides for furnishing the County Court House with coal to be delivered before Nov. 1, has been awarded to **William Moore,** at 14⅜c. per bu. delivered. Address County Clk. W. W. White, Keytesville, Mo.

+1317—Hutchinson, Minn.—This contract (p. 367), which provides for furnishing the local Board of Education with 250 tons of Youghiogheny lump coal has been awarded to the **Interior Lumber Co.,** at $5.13 per ton delivered. Address Secy. Henry Braun, Bd. of Edu., Dist. No. 2, Hutchinson, Minn.

1319—Boise, Idaho—That part of this contract (p. 367) providing for furnishing the Idaho Soldier's Home with coal has been awarded to the **Union Seed & Fuel Co.** at $7.70 per ton for Utah screened lump and $7.20 for Utah screened nut coal. The portion of the contract providing for the requirements of the penitentiary is still under advisement. Address Secy. George R. Barker, Capitol Bldg., Boise, Idaho.

+1322—Brownstown, Ind.—This contract (p. 367), which provides for furnishing the Board of County Commissioners with 300 tons of Youghiogheny coal, has been awarded to **C. F. Robertson,** at $3.45 for coal over a 4-in. screen. Address County Aud. Albert Luedtke, Brownstown, Ind.

+1325—Canton, Ohio—This contract (p. 367), which provides for furnishing the Stark County Infirmary with approximately 1500 tons of coal, has been awarded to **A. F. Sonnhalter** on the following basis: Lump, $1.50; three-quarter lump coal, $1.40; mine-run, $1.25; slack, 75c. Address Board of Stark County Commissioners, Canton, Ohio.

+1326—Dalton, Ohio—This contract (pp. 367, 446), which provides for furnishing the Sugarcreek Township Board of Education with coal during the period ending Jan. 1, 1916, has been awarded to **John Caldwell,** of Dalton, Ohio, at $3.10, and **E. P. Gerber,** Kedron, Ohio, at $3.25. These are minimum prices, the exact figures ranging upward according to distance of haul. Address Clk. Clayton L. Arnould, Bd. of County Comrs., Dalton, Ohio.

+1327—New York, N. Y.—This contract (pp. 367, 446), which provides for furnishing the Panama R.R. Co. with its fuel requirements, estimated at from 500,000 to 600,000 tons of coal, has been awarded to the **Crozer-Pocahontas Co.** and **William C. Atwater & Co.,** at $2.60 per ton for Pocahontas and New River Coal. The contract becomes effective Sept. 15. Address Asst. to Vice-Pres. R. E. Rutherford, Panama R.R. Co., 24 State St., New York City.

+1331—Fairpoint, Ohio—This contract (p. 367), has been awarded to **Geo. Barnes,** of St. Clairsville, Ohio, at 8c. per bu. for 800 bu. of lump coal; **A. B. Conron,** Flushing, Ohio, 225 bu. at 8c. per bu.; **M. C. Huntsman,** Maynard, Ohio, 200 bu. at 7½c. per bu. Address Clk. Addison Saffell, Bd. of Edu., Fairpoint, Ohio.

Contract Notes

Atlanta, Ga.—The contract for furnishing the Atlanta Gas Co. with coal during the ensuing year has been awarded to the **Harlan Coal Co.,** of Louisville, Ky., after a series of tests of numerous different coals.

New Orleans, La.—The contract for furnishing the Central Ice and Cold Storage Co. and the Independent Ice Distilling Water Co., involving approximately 15,000 tons of coal, has been awarded to the **C. A. Andrews Coal Co.**

Missouri, Kansas & Texas Ry.—Press reports are to the effect that this road has awarded an exceptionally large contract with coal interests, who it is understood propose filling the contract on coal that will be stripped near Lehigh, Okla.

Dassel, Minn.—The contract for furnishing the local school with two carloads of Pocahontas egg coal has been awarded to the **Dassel Lumber Co.** at $6.85 per ton. Any further coal required will be furnished at $7.05 per ton. Address Clk. Olof Anderson, Bd. of Edu., Dassel, Minn.

Fond du Lac, Wis.—The contract for furnishing the local Water-Works with approximately 1,200 tons of coal has been awarded to the **Harcum Fuel Co.** at $3.25 per ton. The **Wisconsin Coal and Dock Co.,** of Milwaukee, was awarded the contract for furnishing 800 tons of coal for the schools and library at $3.64 per ton. All prices are f.o.b. Fond du Lac.

Detroit, Mich.—The contract for furnishing the Recreation Commission with approximately 300 tons of anthracite, stove, egg or smokeless has been awarded to the **Michigan Builders Supply Co.,** at $6.66 per ton for anthracite and $4.14 for smokeless. Bids were received from five other companies. Address Supt. Ira W. Jayne, Detroit Recreation Com., Bd. of Parks and Boulevards, Detroit, Mich.

New York—The contract for furnishing the department of Docks and Ferries with approximately 15,000 gross tons of buckwheat and 6,000 tons of semibituminous (p. 492), has been awarded to **Chas. D. Norton & Co.,** at $2.68½c. per ton on each grade. Meeker & Co. bid $2.89 per ton, and Pattison & Bowns the same. Address Comr. R. A. C. Smith, Dept. of Docks and Ferries, Pier A, foot of Battery Pl., New York City.

Auburn, Me.—The city contract for the supply of coal for the municipal year ending Feb. 29, 1916, was divided between **Bearce & Edwards Co.** and **Pulsifer & Young Co.** About 700 tons of bituminous and 300 tons of hard coal are usually required. The contract was awarded at $5.50 for soft and $7.50 for hard coal, to be delivered as required. Bids were not publicly advertised for and Mayor Henry R. Porter was empowered to close the contract.

Philadelphia, Penn.—Due to trial shipments made some six weeks since a number of inquiries for American coal are being received from Denmark. The Danish government realizing that the British supply will be materially reduced made a test of American steam coal in the navy, and there is no doubt that the coal has met with complete satisfaction. At the present time it costs about $14 a ton, f.o.b. Danish ports. If the Government is entirely successful a number of the important Danish coal brokers expect to place large orders here.

Japan—The Japan Chronicle of July 30 states that Japanese collieries have curtailed their output by over 20 per cent. this year as compared with last. In spite of this stocks are increasing. According to the latest investigations quoted by the Mainichi of Osaka, stocks of the collieries amount to 546,000 tons, and those on the Moji and Wakamatsu markets to 738,000 tons, totaling 1,284,000 tons. When small stocks in other parts of the country are taken into account, the grand total will exceed the unprecedented figure of 1,300,000 tons.

COAL AGE

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"SAFETY FIRST!"

SAFETY
FIRST

It is a sounding slogan, all right, and a very excellent sentiment, too. But there are a large number of employers who seem to think it is nothing more.

They stick a lot of "*Safety-First*" signs in various places in the mine and on the surface and then imagine that their duty is done.

As a matter of fact that's only a small beginning.

"*Safety First*" means just that—"SAFETY FIRST."

It means that *safety comes before speed, efficiency or profit.* It means that every possible agency for preventing accidents must be provided in the places where men must work. It means that men must be warned and protected even against the results of their own carelessness.

"*Safety First*" means that no one—boss or miner—must "take a chance." It means that if there is any doubt whether a roof will hold, it must be timbered. If there is any question as to the strength of a cable it must be replaced.

"*Safety First*" means constant, unremitting, painstaking supervision of men and machinery. It means that chutes must be well guarded, powder must be tenderly handled, ventilation must be thorough and that every possible practical appliance which will eliminate risk and reduce humanity's liability to forget or overlook shall be installed.

"*Safety First*" means that money must be spent for equipment, for close supervision, for careful training. It means that every wise provision must be made against accident or disaster—and that there must be a drilled and capable rescue corps to take charge of the grim work of recovery if disaster comes.

"*Safety First*!" is a fine slogan, but if it is really to mean anything, it must be more than that—it must be a mission, a gospel, a religion.

By BERTON BRALEY

Ideas and Suggestions

Value of Competent Mining Engineering

Among many of the smaller operators today, as in the past, the engineering department is considered an unnecessary expense. The result is a higher cost of production through a poorly designed plant and unsatisfactory equipment. As a result of keen competition in the coal business, expenses have been cut in every way possible, and the engineering work has suffered severely.

Reflection has often been cast on the mining-engineering profession throughout the coal fields of the United States because of improperly designed plants and costly methods of production. However, this will be found due to one of two causes—either the work was not given into the hands of a competent engineer, or it was restricted through lack of capital.

At many of the smaller plants the engineering work is being done by some contracting concern from a neighboring town whose corps visit the plant once or twice a month. Projected work must either be put off until the arrival of the corps or done without their aid. Consequently only the most important work receives the attention of the engineers.

Economy of operation and a large percentage of recovery are the aims of every operator, and in order to realize these ends engineers must be employed capable of laying out both the outside plant and the underground workings in a systematic manner, suitable to the conditions found.

One reason for the unpopularity of the engineer is that he must build not only for today but for the future. His plans therefore call for a better grade of work and equipment, and the operator having his eye on the expense or cost, frequently will only approve of the cheapest construction.

Many operators when about to buy a piece of machinery write to several builders and state in a general way what is needed, and when bids are received there is found to be a wide range in the size and price.

Specifications Are Necessary

In the building of a plant it is necessary that specifications be prepared if the work is to be done by contract, for otherwise it is almost certain that only the cheapest kind of work will be secured. This is true also in the purchasing of equipment, for if there are no specifications there will be no satisfaction in the end, either to the buyer or to the seller.

The value of the data collected by an engineer cannot be overestimated in the laying out and projection of a mine. It is only when this information is at hand that the cost of haulage and drainage can be reduced to a minimum. There are many mines throughout the country where these items are eating up a big share of the profit. There are others where changes have been made and better results secured, but in these cases also the cost of experimenting has been paid.

Many tons of coal and much money have been lost as a result of inaccurate surveys. Coal mining requires accurate surveys and maps both of the surface and the underground workings. These maps should show the mine workings exactly as they are, and should be brought up to date at least every six months. Meanwhile, at the end of every month, all work done during the month should be placed on the map in colored pencil. With the aid of these maps the development work can be kept in proper order, and in the retreating work the fracture line can be kept in better shape.

An engineer is needed around a coal plant at all times. Efficient and economic operation can be secured only through his aid.

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Importance of Little Things

By C. P. Shockley

"It seems to me," remarked the superintendent, "that economy does not play the important part in the operation of mines that it should, when we consider the wonderful opportunity we have to exercise it. The lack of economical methods has caused the loss of more money in the mining business than any other single feature.

"It is just as true in mining as in other lines that a dollar saved is a dollar earned, and is in truth a great deal easier to save than to earn.

"Of the large investments in equipment and improvements necessary at mines to offset wage increases and other conditions that materially influence the productive cost of coal, the effect is lost oftentimes by lax and uneconomical methods of management.

"Some officials are firmly imbued with the idea that to secure adequate returns large outlays are necessary, and entirely overlook the chances to save by careful management.

"The matter of saving in labor and supplies can of course be carried to such extremes that it will prove to be a menace, but a well-planned campaign of economy, if carefully administered, will yield good results.

"Our pitboss at No. 4 put on a heavy force last Thursday, an idle day, to clean tracks, the expense amounting to about $150. In the present state of the market, when demand for coal is light, the selling price low and work irregular, strict economy is necessary. He used this force of men to clean up the entries on the west side, where dirt had accumulated during the 'sweating season,' and argued that the cheapest way was to put on enough men to handle it in one day.

"At our No. 5 opening we have a mine similar in almost every way to No. 4, and our mine boss at this plant keeps close watch over the day men. As an illustration, when a track-layer is sent into an entry to lay a room turn, and the work is sufficient to keep him occupied for three-fourths of a shift, such a man sometimes will 'loaf on the job,' and thus lose enough time to have enabled him to finish out the shift at that place, take his tools to the parting at quitting time and be ready to make a fresh start in some other direction in the morning.

"This foreman at our No. 5 mine has a way of dropping in on such idlers and seeing that they finish up their work promptly and clean their track in a reasonable amount of time.

"At this same mine we had a number of loaders we called 'the early quitters,' men who when the turn ran good would slip away home early in the afternoon. After some little time the foreman managed to collect these fellows in one part of the mine—and not a very desirable part at that. When they drifted out early and the drivers in that section ran out of coal, he utilized them in cleaning roads the remainder of the shift.

"Another thing that greatly helps the boss when he is short of loaders and coal is coming slow, is to carefully arrange a transportation force sufficient to handle the output, the men not necessary for that purpose being delegated to cleaning track and doing other necessary work.

"When oil barrels are emptied and stored outside the mine (to store them inside is unsafe and is prohibited by the mining laws) they usually fall to pieces before a carload is accumulated, and a wise foreman will arrange a shallow pond with the expenditure of very little money, where by storing his barrels in a damp, shady place he obtains what we could appropriately call a large percentage of recovery.

"I have seen well-managed mines show a saving in the amount of timber, ties, spikes and rails used per ton that was remarkable, owing simply to a well-defined system of removing these supplies from worked-out sections before the falling roof buried them.

"All of the foregoing considerations impress upon us the importance of the mine foreman's work and emphasizes the fact that upon his shoulders rests the responsibility for carrying out the plans that will eliminate the various sources of useless waste and develop a system that will prove economical and successful."

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Cleanliness and Efficiency

By E. S. Bonnet

On a recent inspection tour of the mine plants by the "big officials" of a large coal-mining company, the president criticized some of the superintendents rather severely on the uncleanliness and generally unfavorable appearance of the camps. He ordered a tipple painted here, a boiler house cleaned there, more windows and better light in the power house at another mine, while at still another plant he ordered the scrap material picked up from around the shaft and shop buildings and placed in a pile out of the way of the workmen.

Some of the superintendents commented on the orders in this fashion: "Why, the president didn't inspect our plants at all. He doesn't know anything about mining coal. All he saw was the outside of things—that this needed painting and that needed cleaning up. I'm glad he told us to do it, for it costs money, with no returns, and I would not have spent the money otherwise, even though I like to see things look nice."

This president is a successful man and knew what he was doing when he ordered things cleaned up. It so happened that about a month after the inspection tour some important changes were ordered in one of the tipples which it had been decided to paint, and when the work started the timbers were found to be so badly decayed that the tipple had to be virtually rebuilt.

In the power house where more light and a general cleaning up was ordered a large crack was found in the engine base, which probably would have shortly put the machine out of commission. This base was intended as a catch for the oil falling from the moving parts of the engine, but it ran through the crack and was disintegrating the foundation. A new engine bed was built, the crack was welded and the oil led into a receptacle. There is enough of this oil saved already to pay for the cost of the foundation improvements.

At another mine, where scrap was allowed to accumulate around the plant, a mule which was brought out of the shaft at night became frightened at something just as he stepped off the cage and ran into an old sheave wheel lying near the shaft and broke his leg.

The Men Prefer New Mines

It usually happens that when a new mine is opened in a district already producing there is no trouble in securing men. It seems as if most of the men want to work at the new plant. The reason is that the houses are new and better to live in, while the machinery is likewise new and easier to work with.

Why should men prefer new to old things? Because generally the old things are not kept clean and in repair. Isn't it logical to suppose that a man would prefer living in a house which has been his home for some years, which is freshly painted, is warm and well lighted, with a good roof, a nice fence around the place, and a nice lawn and flowers, than to move into a new house, with its consequent mud, dirt and strangeness? Why shouldn't a man prefer a piece of machinery with which he is perfectly familiar to one entirely new and strange to him, if the old piece is kept clean and in good working order?

In the course of my duties I have to visit a number of mines. In one of them the entries are kept clean, the fallen coal is quickly picked up, the ditches are frequently cleaned out, the falls of rock are immediately hauled away and the track is well ballasted. It is a pleasure to visit this mine. In another operation, the rooms are off sights, the track is crooked, the roadways are so full of fallen coal that one day in ten motor trips I counted seven derailments.

In this mine the ditches are not kept clean, in places the rail being under 3 or 4 in. of water. I have never left this mine with dry feet, and I dread the visit and put off the inspection as long as possible.

Think this over, Mr. Mine Man, and see at which plant you would rather work—at the plant which has fresh paint, where the dirt and scrap is cleaned up, which provides bright airy buildings and clean homes and streets, or the other plant, which has not seen paint since it was built, where the workshops are dark, the entries wet and strewn with coal, the yards covered with scrap and refuse, the streets unlighted and the houses filthy.

Which camp would you rather work and live in, Mr. Miner? And which plant, Mr. Superintendent, would you rather have charge of, and which plant do you think offers the most inducements for a man to give all the best there is in him to make the mine a success?

Control and Costs of British Rescue Stations

By Professor Henry Briggs*

SYNOPSIS—The writer compares the advantages of private with central mine-rescue stations and gives the reasons which sometimes make it advisable to treat the central station mainly as a place of training and in other cases to maintain it as an actual rescue center.

The control of rescue stations in America and Great Britain must necessarily differ for many reasons. The law relating to rescue work is not the same in the two countries; the nature of the training of the men probably also differs in details; and the average area served by a station must be considerably smaller in the latter country than in the former.

In *Coal Age* for Oct. 4, 1913, for example, is to be found a description of an admirable 40-hp. mine-rescue automobile built for the Pittsburgh Bureau of Mines, and at the end of that description it is stated that the car "is to be used to travel moderate distances, from 25 up to 100 mi." If my inference is correct and the station at which this car is housed serves a radius of roughly 100 mi., then it is quite certain that our British rescue stations are planted much more thickly than those in the United States, for in this particular connection we should not hesitate to call 100 mi. an extremely long distance.

But be these differences what they may, there is, I believe, sufficient in common between the rescue-station problems of the two countries to make a short review of the British position worth while.

Should Companies Combine for Rescue Work?

Rescue training and the provision of rescue apparatus are compulsory at the coal mines of Great Britain, complete exemption being only granted for small collieries so remotely situated that they cannot be served by a central station. As a matter of fact, exemptions are few in number. The regulations in question do not apply at all to oil-shale, ironstone, or fireclay mines which fall within the scope of the Coal Mines Act; nor even to metalliferous mines.

A colliery company is given the choice of complying with these regulations either by undertaking the training of its own teams and maintaining the necessary apparatus at the mines, or by joining with other neighboring companies in providing a central rescue station to serve them all.

Many companies have made careful inquiry as to which of these alternatives is the better. It is no secret that the mine inspectors are in favor of central stations as against individualized training. The question, however, is simpler to the inspector than to the colliery owner. The former does not trouble about costs, whereas the latter must. There can be no doubt as to the greater efficiency of the training procurable at a central station, where there is an expert instructor who gives his whole time to the work. Moreover, the apparatus itself is usually maintained in better condition at a central station than at a colliery. These advantages of coöperation cannot be neglected by anyone striving to reach a sound conclusion on the question, however much he may be obsessed by costs.

If Lord Roberts' dictum that "one trained man is worth ten men untrained" be accepted for rescue work as well as in its military sense, it might with equal truth be said that one properly trained man is worth five men half trained. Work with breathing apparatus, in fact, is dangerous under the circumstances which obtain at a mine fire or after an explosion, unless the wearers of that apparatus are thoroughly skilled in its use. Again, breathing equipment should be overhauled and tested with such frequency and care that the rescuemen can depend on its being in order at all times. A faulty apparatus is more dangerous than none at all. Unless the men are sure the equipment is serviceable they cannot have full confidence in it, and their personal efficiency is reduced thereby.

To sum up, if rescue training is done at all, it must be done well, and there is a better chance that it will be so done at a central station than when each coal company acts separately and according to its own lights.

Which Costs More, Central or Private Stations?

So much for the viewpoint of efficiency. But how about the aspect of cost? Obviously, the expense of a central station is borne more easily the more there are to share it. In fact, in a district thickly strewn with collieries the central station becomes by far the cheapest way of complying with the regulations of the Home Office. On the other hand, in an area where mines are few and far between such a station may be found too expensive. There must therefore be a point at which the cost of rescue-station training and that of individualized instruction is the same.

It is interesting to determine where this point lies. We are certainly not far from it in the Edinburgh district. Here there are roughly 10,000 men employed underground in coal mines, and in all 33 brigades (each of not less than five men) must be trained to satisfy the rules. Two companies, requiring between them six brigades came to the conclusion that it would be cheaper to train their teams themselves and to maintain the requisite apparatus at the collieries. Accordingly, they bought equipment and fitted up smoke galleries, and at each mine a man is engaged for part of his time in putting the brigades through practice drill.

The other companies in the district either convinced themselves that a central station would be cheaper or found so little difference in the figures that, on the ground of greater efficiency, they were able to approve of the centralization. I incline to the belief that under the conditions obtaining in Great Britain, at any rate, a central station scheme and independent training at the different collieries will cost about the same in a district requiring about 24 brigades. The consideration of efficiency, however, makes the central station preferable even for a smaller district, and as examples of successful stations serving small areas mention may be made of those at Tankersley, Yorkshire, and at Wath-on-Dearne, in the same county. The former, which was the first coöperative station erected in Great Britain, is connected with only seven collieries and the latter with only nine.

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There is one other appeal that can be made in favor of the rescue station—it shifts a little worry and trouble from the mine manager's shoulders. Moreover, if he has to answer before a court of law or official inquiry for the provisions he has made as to rescue work, he will be more easily able to prove that he has done his best to comply with the regulations if his colliery is associated with a rescue station than if it is not.

Should a Fixed Corps Be Kept at the Station?

Assuming that the coal companies in a district decide to combine in providing a rescue station, they are faced with another problem. How is it to be run? There is a choice between two methods, which for convenience we shall term A and B. In system A the personnel at the station consists merely of the instructor-in-charge, who usually has an assistant. The brigades, each of not less than five men, are enrolled at the collieries and are sent to the station to receive their training once a week for at least 13 weeks.

In system B a permanent brigade resides constantly at the station, ready to be despatched to any associated colliery. This permanent brigade must consist of not less than six men, the instructor and five others, or, if there are more than 15,000 underground employees at all the mines served by the station, the brigade must consist of not fewer than eight men. With such an organization, which is much akin to that of a fire station, there is no need to train nearly as many men from the collieries as is required under system A; and as will be seen by the following table, the British regulations take this fact into account:

Number of Men Employed Underground	Minimum Number of Colliery Employees to Be Trained in Rescue Work System A	System B
Less than 250	5	1
250 to 700	10	3
700 to 1,000	15	
More than 1,000	20	5

With system A a group of mines belonging to one owner is treated as one mine for the purpose of ascertaining the number of men to be trained, provided the shafts or outlets lie within a circle of two miles radius. No such grouping is allowable under system B.

Which of these systems is the better is still quite an open question. If the second is to possess any superiority, it must lie in the better training that can be given to a permanent brigade of picked men, and everything must be subservient to bringing these men to a high pitch of efficiency and keeping them there. The weakness of the system is perhaps in carrying all one's eggs in a single basket.

Training Centers Cheaper Than Rescue Stations

Excellent in quality though the permanent brigade may be, it may suffer disaster, particularly if it consists of only six men. In this event a mine may be left with an insufficient reserve of trained men. The objection that a brigade housed at the station cannot know the mine as does one drawn from the employees at that mine is to some extent removed by the fact that there are, as the table shows, a few trained men at each mine capable of acting as guides.

When everything is considered the first system seems to me the cheaper as to running cost. I have had to analyze the question closely in reference to the rescue station which was recently built in connection with my department at the Heriot-Watt College, Edinburgh. In that instance the second system, had it been adopted, would have required the provision of a permanent brigade of six men. Five of these would have cost $9 per week each, while the sixth, the instructor, would have been given free quarters, coal, light and $750 per annum.

Allowing for this and all other station charges, except that of running the automobile, and adding the wages and railway fares of colliery employees undergoing training, it was estimated that the running cost for the first year would under system B be $6,090 and under system A $5,385, showing a difference in favor of the latter plan of $705. The estimated difference in first cost on the station and apparatus was nearly $15,000 in favor of system A, chiefly owing to the fact that under that plan housing accommodation for a permanent brigade did not need to be provided.

It is advisable to add that these figures are not meant to suggest any general conclusion in regard to the relative costs of the two systems. Conditions differ in every district, and estimates must vary accordingly. It is quite possible, indeed, that the running cost of a station under system B will be found actually less than under the rival system for a dense colliery area employing, say, more than 20,000 men underground within a radius of 10 mi. from the station. But the first cost must always be higher under system *B*.

How Idle Time of Rescuemen May Be Filled

Another objection to that plan is the difficulty of controlling a number of young men with so much slack time on their hands. They cannot always be practicing with apparatus or drilling in the gymnasium, and a station does not need an exceptional amount of manual labor to keep it clean and orderly. A strict, semimilitary discipline has to be maintained, and much more responsibility is thrown on those in charge.

This difficulty of an abnormal proportion of idle time has been met to some extent at the important Newcastle-on-Tyne rescue station, where the permanent brigade system has been in successful operation for a number of years. In that city the mine-rescue corps also furnish fire protection to factories and other properties. The Newcastle station is exceptionally fortunate in having been able to secure this additional work.

We in the Edinburgh district, at any rate, could not see that the advantages of the permanent-brigade system were so overwhelming as to counterbalance its drawbacks and its costliness and decided therefore in favor of system A. As a matter of fact the majority of British stations are organized under that plan, and the rest of this article is concerned with that system only.

The permanent-brigade system is in operation, however, at the Newcastle station already mentioned and at three other centers in Northumberland and Durham. It is also being regarded with favor, I believe, for the Lanarkshire station at Coatbridge; but this center is not yet completed. It is also worthy of remark that the permanent-brigade system is that adopted at the important station in Liévin, northern France.

The following figures refer to system A, under which the only person housed at the station is the instructor, and they assume that one of the forms of oxygen-regenerator breathing apparatus is to be adopted.

Unless buildings already exist which can easily be adapted, a central station on not too lavish a scale usually costs between $10,000 and $12,500 for buildings and permanent fittings. To this must be added $5,500 for a complete equipment and from $2,500 to $3,500 for a specially built automobile. It is also wise to buy a second car—a light, cheap knockabout at, say, $1,000. Treated considerately, a light car of this kind is economical and handy for running to collieries when the apparatus maintained at the mines has to be changed for freshly charged and overhauled apparatus from the station or when brigades are to be put through their drill at the mine.

The annual running costs of a station, not including those of the automobiles—a variable item—usually amounts to about $22 or $25 per person trained. This figure does not cover the wages and fares of the men.

Owing to the increasing price of materials and labor, the first cost of a station has a continual upward tendency. On the other hand, recent improvements in regenerators are considerably reducing the expenditure for drills. When the liquid-air apparatus is adopted the first cost is increased, but the running cost is still further cut down.

How Collieries Share First and Annual Costs

In Great Britain the whole cost of a rescue station is borne by the colliery owners. There is assistance neither from the government nor from the miners' union.

There are four methods in use by which the costs of a rescue station are shared among the various companies associated with it. These are as follows:

1. Imposing an equal share on each colliery.
2. Dividing charges according to the number of brigades requiring training.
3. Apportioning expense according to the coal output of the collieries, or, what is almost the same, according to the number of underground employees; or
4. A method combining methods 2 and 3.

The first plan, which is employed at two of the smaller coöperative stations, may be dismissed at once. It is manifestly unfair to the smaller concerns.

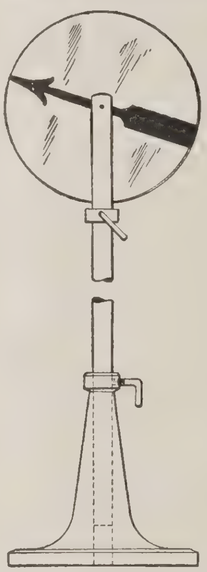
The number of brigades requiring training under system A is not in proportion to the number of underground employees, for large collieries have proportionately fewer corps than smaller operations. Thus a pit employing 150 men below ground requires one brigade of 5 men, whereas a pit employing 1,500 requires, not ten, but only four brigades. The second method of dividing the costs presses somewhat severely, therefore, on the smaller collieries. They find that with that method their expenditure for rescue work, when expressed per ton of their output, is more than is being paid per ton by a large colliery near by.

Some of the larger collieries, on the other hand, are up in arms against the third method—which is nevertheless the commonest of all. They claim, with a show of justice, that as their legal obligations are met by proportionately fewer brigades, their costs should be proportionately less. The result is that the smaller companies are passionately devoted to method 3, while the larger companies are just as strongly in favor of method 2.

As it must be admitted that there is something to be said on both sides, a compromise may have to be sought. It is found in method 4, which is that adopted by two stations. Probably the most equitable system on which to divide rescue-station costs is to share the first cost of the station and equipment on the tonnage basis, or, alternatively, according to the number of underground employees; then to divide the annual running cost under two heads—that is, "training charges" and "general charges," the former being distributed according to the number of brigades each company requires and the latter in proportion to the tonnage mined or to the number of underground employees engaged.

Under "training charges" go all items of annual expenditure directly resulting from the training or practicing of brigades, such as the cost of chemicals and oxygen, repairs to apparatus, charging lamps and a fair proportion of lighting and heating costs. The "general charges" include everything not placed under "training charges."

A Holder for Danger Signs



A CONVENIENT DANGER SIGN

Safety experts attach much importance to the disk-shaped danger signs of different colors now used by many industrial concerns, says J. E. Cooley in the *American Machinist* of Sept. 2. The drawback, however, found in using these signs is that there is not always a suitable place to hang or tack them up at a point where danger exists. The workmen are therefore exposed to hazard because it is too much trouble to provide a means by which the admonition may be displayed.

The illustration shows a danger-sign holder that can be moved about for temporary use or fastened to the floor. It is made so that it can be used anywhere and is so constructed that the sign can be set to point directly toward the danger to be avoided.

It consists of a cast-iron base having an adjustable rod about ½ in. diameter, held in place with a binding-screw in the base. The top of the rod is sawn down a short distance through the center so as to provide a place for the sign, which turns in a small pin, as shown. The binding-collar and screw near the top secures the sign in place, after the arrowhead is set to point at the danger to be avoided.

The use of these holders will prevent many accidents. Several of these signposts should be made and placed where they will be accessible at all times.

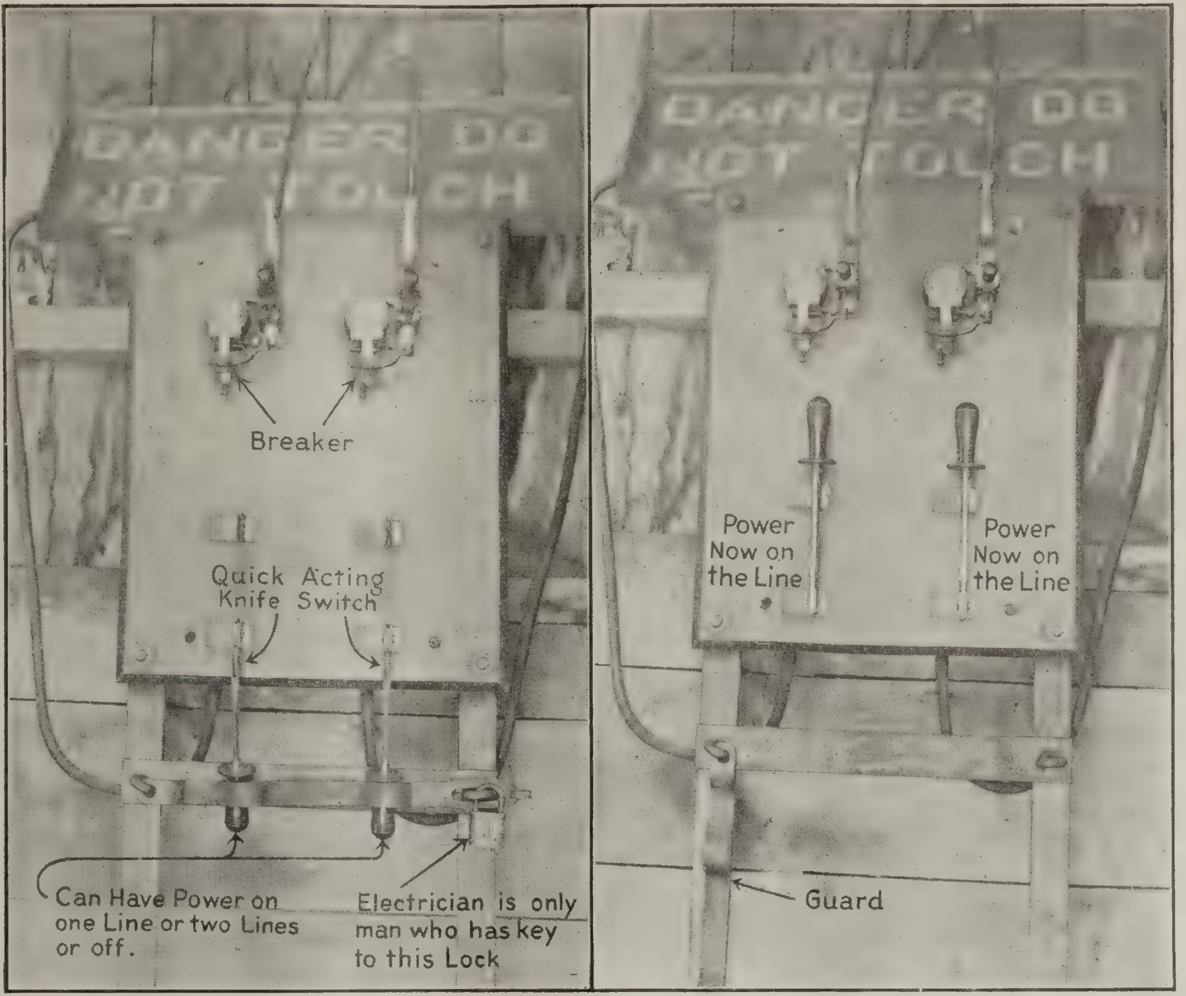
A Safe Switchboard

At many mines where electric transmission is employed crude means are provided for switching the current on and off. Not long ago a mine came under my notice where a knife switch attached to a pole exposed to the weather and within reach of a tall man was used for this purpose. When in the morning the men wanted to throw on the power they would do so with the aid of a stick. Frequently the stick employed was wet, with the result that the man who used it would receive a shock.

I changed this method and installed a switchboard in a small building, guarded as shown in the illustrations. Now when there is anything the matter with the lines the electrician can lock out the switch which controls the defective circuit with a private lock, to which no one but himself has a key. This insures that he will be entirely safe from injury caused by the switch being thrown in either by mistake or through ignorance.

To make these switches safer, a set of lights was installed, which burn whenever the power is on the line, thus illuminating the switch-house, which enables the men to see plainly the live wires coming into the switchboards.

Several experts have examined this installation and said that it was "all to the good," and that they could not see where the design could be improved, considering the work to be done.


DANGER DO NOT TOUCH
Breaker
Quick Acting Knife Switch
Can Have Power on one Line or two Lines or off.
Electrician is only man who has key to this Lock
DANGER DO NOT TOUCH
Power Now on the Line
Power Now on the Line
Guard

TWO VIEWS OF SWITCHBOARD SHOWING SWITCHES LOCKED OUT AND WHEN CARRYING CURRENT

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Coal Mining in Montana

Montana mines produced 2,805,173 short tons of coal in 1914, valued at $4,913,191. As compared with 1913 the production of coal in Montana in 1914 showed a decrease, according to the Geological Survey, of 435,800 tons in quantity and $740,348 in value. The major part of this decrease occurred in Carbon and Musselshell Counties, the coal of which is used mainly by railroads, and in the Great Falls field, in Cascade County, which supplies a large quantity of coal to the copper smelters of Anaconda and Great Falls. Other coal fields, however, such as the Lewistown, in Fergus County, which supplies the domestic trade, showed a small increase such as normally follows an increase in population.

There were no serious interruptions to mining operations in 1914 because of labor troubles, and there was no scarcity of labor. A total of only 171 men was reported on strike, for an average of seven days each. The quantity of machine-mined coal increased from 1,076,641 tons, or 33.2 per cent. of the total product, in 1913, to 1,213,051 tons, or 43 per cent. of the total, in 1914. The proportion of coal shot off the solid decreased from 35 per cent. (1,143,364 tons) in 1913 to 32 per cent. (895,279 tons) in 1914.

The number of men employed in the coal mines of the state in 1914 was 3350, and they worked an average of 209 days, as against 3630 men for an average of 228 days in 1913. The mine workers of Montana have a good record for efficiency, the state in 1912 showing the best average production per man per day among all the coal-producing states. In 1914 the average production per man for the year was less than in 1913 (837 tons against 893 tons), but the average daily output by each employee was 4 tons in 1914 as against 3.92 tons in 1913 and 4.03 tons in 1912. The fatality record maintained by the Bureau of Mines shows a decrease from 20 in 1913 to 8 in 1914. Thus the loss of life in the mines for 1913 was one man per 181.5 employed or per 162,048 tons mined. In 1914 the loss was only one man per 418.8 men at work or per 350,647 tons of output.

Mine Rescue Signaling Device

By Oscar Cartlidge*

SYNOPSIS—An electric cable life line for mine-rescue work has been devised by the safety inspector of the Superior Coal Co.

The illustration shows a signaling device for mine-rescue and fire-fighting crews, based on the ideas of James Boston, safety inspector for the Superior Coal Co., Gillespie, Ill. It was worked out and perfected by Herman L. Seekamp, chief electrician for the same company.

Three No. 6 Columbia dry-cell batteries are placed inside the spool of a regular Jeffrey machine-cable reel, to which is connected 1,000 ft. of round, insulated, No. 16, three-wire cable. In the hub is fixed a "buzzer" button, and to the other end of the wire is attached a "buzzer" of the ordinary type, which is inclosed in a moisture-proof brass case of special design. This is provided with a loop through which the belt of the operator is passed. A stout cord of sufficient length and having at one end a stirrup or handhold is attached to the wire about 5 ft. from the end, and by this means the cable can be dragged without putting any stress on the buzzer. Similar handholds are placed at regular intervals for others of the crew.

In the operation of the device the reel is carried to the "station" or base of operations and is left in charge of a "reelman," whose duty it is to see that the wire does not become entangled while being paid out and to take up slack when notified through the life line. He also attends to all instructions received from the rescue team. A printed code of signals is attached to the reel, and a similar code is carried by the inside leader; but as a further precaution he is also required to memorize it.

The following code has been devised for use by teams at work, it being the intention to have as few signals as possible, because they should be memorized by all the inside men.

CODE OF SIGNALS FOR USE WITH LIFE-LINE

From Inside to Outside

One long ring means "All is well."

One short ring means "Take up, or stop taking up life line."

Two short rings mean "In dark; coming out."

Three short rings mean "Trouble; send in assistance."

Four short rings mean "Rescue corps leaving life line."

From Outside to Inside

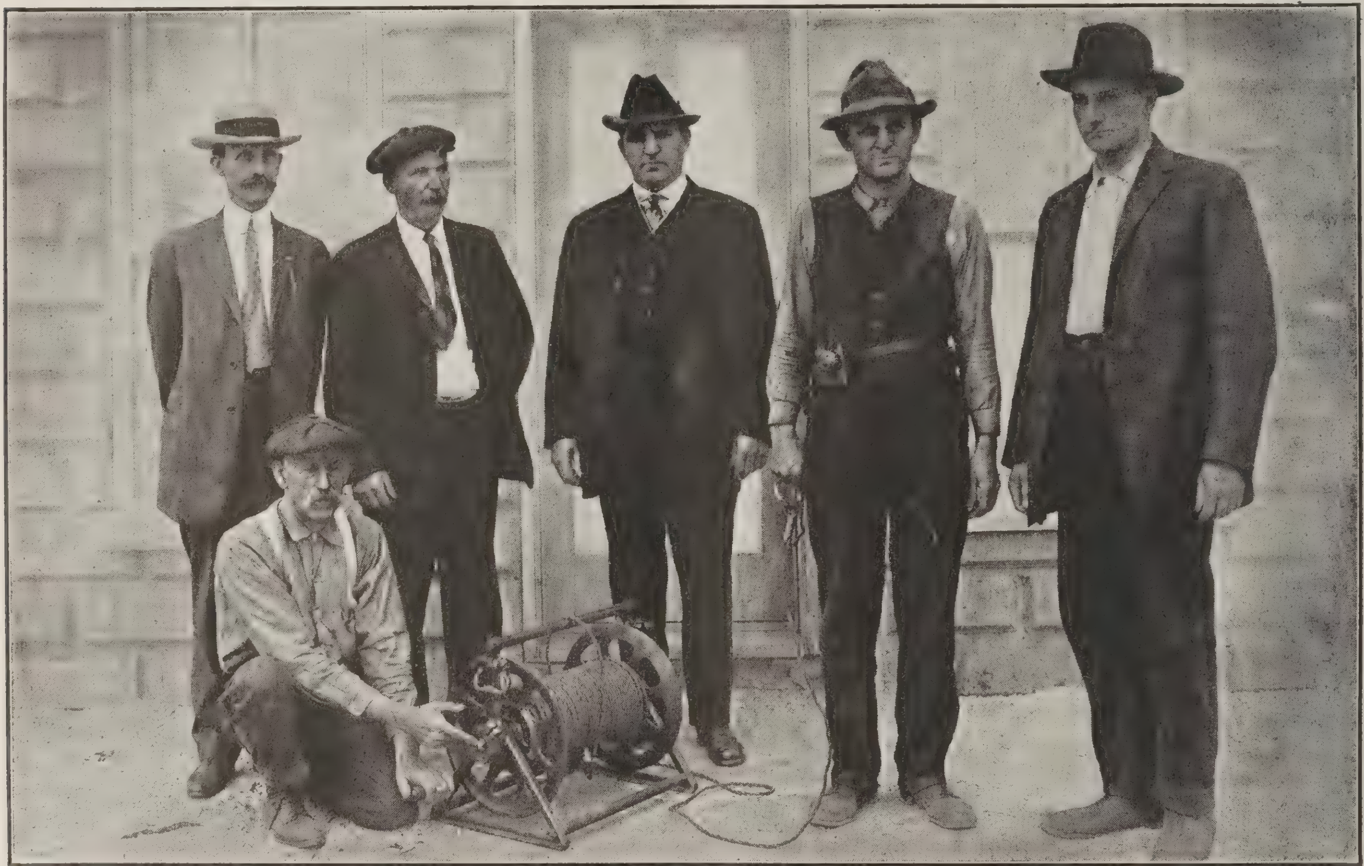
One long ring means "Want to hear from you."

One short ring means when life line is in motion "Stop," and when life line is stopped means "You may proceed."

Five short rings mean "Assistance coming."

This device is not only useful for signaling purposes but serves as a life line for inside crews when they are compelled to make their way out of the mine in dense smoke. It has an advantage over a telephoning apparatus in that it is not necessary to attempt articulation, which is always difficult when wearing a breathing apparatus in irrespirable air. It is out of the way, compact, and therefore easily transportable. Its entire weight does not exceed 100 lb., and it costs to construct, including 1,000 ft. of wire, not more than $40.

This apparatus has been proved to be satisfactory and practical after long use in the Superior Coal Co.'s mines.



A GROUP OF OFFICIALS WITH THE MINE-RESCUE SIGNALING DEVICE

From left to right, standing—Oscar Cartlidge; Archibald Drew, state mine inspector; John P. Reese, general superintendent of properties of the Northwestern R.R.; Herman L. Seekamp, chief engineer, Superior Coal Co.; and P. H. Shanahan, superintendent, Superior Coal Co. The man kneeling is James Boston, safety inspector of the same company

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Mechanical vs. Manual Methods of Resuscitation

By Dr. James M. Booher*

SYNOPSIS—While manual methods of resuscitation serve a useful purpose, the air they furnish is less than is naturally supplied by vital action when the person is in normal condition. The author states what characteristics he believes an insufflator should possess.

Resuscitation of the apparently dead has been attempted by various means since the beginning of history. The ancient Greek and Egyptian physicians used reeds through which they endeavored to blow air into the lungs. The first really organized effort toward establishing permanent first-aid stations was made at Amsterdam, Holland, in 1767. Shortly after this, in 1774, the Royal Humane Society was organized in London. Its record shows that it used the bellows successfully as a means of resuscitation. For a considerable length of time the methods of this society were regarded as standard and received the approval of the civilized world.

Dr. LeRoy de Etoiles, who experimented on the apparently dead, especially with the bellows, reported to the French Academy that lung tissue could be ruptured by this means. Following this report, the French Academy appointed Dr. M. M. Dumerial and Dr. Magendie as a committee of investigation. The report which these two physicians made to the academy was not read for several years after it was submitted, and, due to a misunderstanding, the medical profession of the entire world was under the impression that this committee had condemned mechanical resuscitation.

What the committee actually did report was that the bellows, which was the device in general use up to that time, was the best means known of preserving the life of those apparently dead from asphyxiation and other causes, and they recommended that more time be devoted to the training of the men who were to use the bellows, and that the instructions given them be so modified that the attendants would not injure the lung tissue.

Following this, Dr. Silvester brought forth his manual method of inducing resuscitation of the apparently dead. This was followed by the introduction of the Schaefer manual method.

Manual Methods Furnish Only Minimum Air

The Schaefer and Silvester manual methods of artificial resuscitation are now in universal use. Many thousands of men have been trained, and rightfully so, in their use. That they are the most available of the manual methods of resuscitation and can be applied immediately is the principal argument in their favor. They were formerly thought to be much more efficient than they really are. The early experimenters, in examining and investigating both methods, failed to take into consideration the fact that the conscious individual will automatically take just the amount of air that he desires. They overlooked the fact that this is an involuntary action and cannot be controlled.

Later investigators, by performing experiments on a subject in apnœa (a condition where all desire to breathe has been removed) found that the air exchange secured by these manual methods is dangerously near the minimum requirement for the preservation of life.

The maximum amount of air exchange which can be afforded a subject in apnœa, by use of the Silvester or Schaefer manual methods is 300 c.c., whereas a person normally breathes at each respiration from 500 to 600 c.c. This shows that neither method will give a man as much air as he would normally breathe. The only known means of giving an asphyxiated person a sufficient amount of air to maintain life is by forcing this air into the lungs mechanically. The following table, taken from Technical Paper 77, United States Bureau of Mines, shows the exchange of air secured in a normal subject and in one in apnœa. In other words, the table shows the amount of air a man normally breathes and the amount of air exchange that can be secured by the Silvester and Schaefer manual methods.

	Subject Normal	Subject in Apnœa
Silvester method	500-600 c.c.	150-200 c.c.
Schaefer method (arms flexed at sides)	500-600 c.c.	125-200 c.c.
Schaefer method (arms stretched forward)	500-600 c.c.	200-300 c.c.
Natural breathing at the same rate as the artificial	500-600 c.c.	

In order that the amount of air replenishment secured by manual methods, as given in the table may be compared with that obtained by mechanical means it may be stated that the lungmotor will give an air exchange of 750 c.c. per respiration.

What Is Needed to Restore an Asphyxiated Person

When a person is breathing naturally there is an increase in the "negative pressure" in the thoracic cavity. This is known as the suction action of respiration on the heart and great vessels. That the manual methods do not permit or cause the normal fluctuations of pressure in the thoracic cavity also contributes to their inefficiency. It is now a recognized fact that it is necessary to maintain the statics (pressures) in the thoracic cavity if the following ends are to be obtained:

1. Restored circulation, which (a) renews the suction action of the thorax, (b) tends to prevent fibrillation of the heart, and (c) raises coronary blood pressure.
2. Restored respiration, because (a) the blood must be supplied with oxygen; (b) this oxygenated blood must be carried to the respiratory, circulatory and other brain centers; and (c) this oxygen must be in sufficient amount to maintain the cell metabolism of the brain.
3. Normal exchange of air.

It is understood that the above-mentioned results can be obtained only with a mechanical device, and then only during the period previous to that of absolute oxygen want and a few minutes thereafter.

The dangers inherent in both the Silvester and Schaefer manual methods of artificial respiration, though real and not of infrequent occurrence, have probably been magnified. They should in nowise negative the use of either method. In case of accident one of these methods—preferably the Schaefer—should be followed immediately, but a mechanical respirator should be secured as quickly as possible, because in critical cases, where a real period of oxygen want is being experienced, the mechanical device will do that which neither of the manual methods can accomplish.

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The fact must always be kept in mind that a mechanical device, to be successful in resuscitating an unconscious individual, must be applied within a reasonable length of time. In other words, the device must be readily available to the scene of accident. One of the great troubles in connection with mechanical respiration has been that the general public did not realize that in order to be effective the devices must be applied within the first half hour after an accident. This is a maximum time. A larger percentage of lives will be saved by devices applied within the first 15 min. than when their use is delayed for the longer period.

In cases of electric shock and drowning, no more than 15 min. should elapse after the accident before the device is applied, and more lives will be saved where the appliance is used during the first 5 min. This is not impossible of accomplishment, because the devices are small enough to be placed on every electrical repair wagon, in every power house and at all points where an accident may be likely to happen.

As an example, experience has taught that, in cases of drowning, the machines which are located on the beaches, where the accidents are liable to occur, have been extremely successful in resuscitating all those who have been removed from the water within a reasonable length of time after submergence.

In cases of carbon-monoxide poisoning, or gas poisoning of any character, the time limit for the application of mechanical resuscitating devices is much greater than in cases of drowning or electric shock, because a man who has been overcome by gas may remain in a condition of partial oxygen want for a considerable period of time before an absolute deprivation of oxygen from the system occurs. In other words, the success of any device after any given period of delay depends entirely on how much carbon monoxide has been absorbed by the hemoglobin of the blood. In such cases it is desirable that the oxygen be administered under pressure, in order that a greater absorption of oxygen may be secured.

What an Insufflator Should Do

The securing of an efficient mechanical respirating device has been a laudable object of experimental work by physicians for many years, and as a result a number of devices were made which were without doubt more efficient than the manual methods and which have been used most successfully in cases of gas poisoning.

Mechanical resuscitating devices until recently have not been so successful in electric shock and drowning because in these two conditions it is necessary to accomplish many things which the machines failed to do.

In drowning, the devices failed to remove the water from the mouth and trachea and to draw the mucus from the air passages. In electric shock they failed to maintain the statics (normal pressures) of the thoracic cavity, and had practically no tendency to facilitate the heart action by increasing coronary blood pressure.

They were simply devices for putting air into and removing air from the lung, and the fact that they could give sufficient air to maintain life was their only favorable feature. The dangers inherent in them were recognized by many persons, but when life was seriously menaced these dangers were not sufficient to warrant a rescuer in not using such devices.

At the present time there is on the market a device, the lungmotor, which is safe, effective and small enough to be available for general use. This apparatus was under observation and the closest investigation of the United States Bureau of Mines for about 19 months before that body decided to install it in its first-aid cars and stations. This was in April of the present year.

In the light of present knowledge a mechanical respirator, in order to be acceptable to the medical profession and the public at large, should be able to conform to the following standards, and with these the lungmotor adequately complies:

(1) No mechanical respirator should be considered efficient which will not keep alive an animal so completely curarized that it cannot breathe. In any such test when the mechanical respirator is stopped the breathing of the animal should cease. (2) Normal excursions of the diaphragm should be secured with visible inflation of the air sacks, as shown by inspection of the surface of the lung. (3) The device should be able to remove water from the mouth and mucus from the trachea. (4) It should be able to give air at all times and oxygen and air in any percentage desired. (5) It should keep a lung full of air within the normal diameters of the lung itself. (6) There should be no distension of the lung to the extent which would elongate or flatten the lung epithelial cells. (7) The device should be capable of developing sufficient pressure to remove any foreign object which is not too tightly lodged in the trachea. (8) It must supply a sufficiently rapid exchange of air to maintain human life. (9) The air or oxygen should be introduced into the lung under a safe pressure. The maximum pressure within the limits of safety is desirable. (10) There should be no direct suction action upon the air cells. (11) Suction should be developed within the trachea, but not transmitted to the ultimate air vesicles. (12) The device should maintain the normal pressure within the thoracic cavity, but not within the lung, where a positive pressure is desirable. (13) The device should in no case create a vacuum in the lung or passages. (14) The lung should be kept as nearly as possible in the position in which it was during life. (15) An even rise and fall of the chest wall should not be considered necessary, but it is desirable. (16) The device must be safe, efficient, available and always ready; that is, it should not be so constructed as to get out of order easily.

There is no claim made by the various manufacturers of resuscitating devices that their apparatus will revive the dead; but the claim that a person may be apparently dead and may be revived is borne out by experiments performed in the physiological laboratories, as well as by the experience of men who have used resuscitating devices in many accident cases.

As an example of this: A dog may be apparently killed by ether anæsthesia. He may cease to breathe and his heart may stop beating, and a mechanical resuscitating device will bring him back to life. That this has been done by an eminent physiologist in the United States 30 min. after all respiration and heart beat have ceased shows how tenacious of life animals are.

Cost of Upkeep of Electric Cap Lamps

SYNOPSIS—The material used in the maintenance and repair of lamps at the Crow's Nest mines of the Keystone Coal and Coke Co., excluding all damage caused by miners, has cost not quite 1c. per lamp shift for the six months since the lights were installed.

The Keystone Coal and Coke Co. has its leading mine at Crow's Nest, near Greensburg, Penn. This mine is one of the best and most efficient in the State of Pennsylvania. One of its uptodate features is the installation of electric cap lamps, of which 250 are in use. Illustrations of the lamp and battery racks are shown in this article, and tables will be found setting forth the cost of maintenance and that of mechanical injuries sustained by the lamps when in the charge of the miners.

In the six months covered by the report the lamps were burned for 34,419 lamp shifts. The list cost of the spare parts totals $521.83. A discount of 20 per cent. may be figured on these prices, leaving the net cost of parts and acid consumed $417.45.

But of this some material was broken while in the care of the miners:

6 lamp bodies, at 70c.	$4.20
20 lenses, at 20c.	4.00
218 bulbs, at 45c.	98.10
3 safety devices, at 25c.	.75
2 lamp holders, at 15c.	.30
	$107.35
Less 20 per cent. discount	21.47
Net cost of material	$85.88

This leaves $331.57 of the cost chargeable against the lamp-station expense, and dividing the sum thus obtained by the number of lamp shifts, 34,419, the cost of material obtained is $0.00963, or less than 1c. per lamp shift.

These figures are obtained from daily reports, which are made out in duplicate by the man in charge of the lamp station. One copy is delivered to the mine foreman and the other to the company supplying the lamps, the Mannesmann Light Co. of America. The reports from the lamp foreman are on file and can be inspected by anyone.

It will be noted that the figures given include not merely what are known as spare parts and repairs, but sulphuric acid and celluloid paste also. Thus all possible material charges are included, though of course it will be observed that the cost of current, amortization, interest and labor of lampman are not figured.

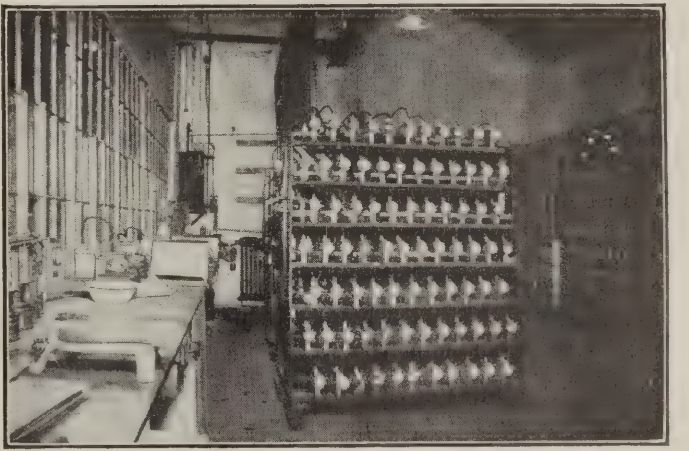
Bulbs and Cables Are Chief Repair Items

It is noticeable that the cost of electric bulbs and cable are the two principal items in the list. Schedule 6A of the United States Bureau of Mines requires that the average life of lamp bulbs shall be not less than 300 hr. for primary and acid storage batteries and not less than 200 hr. for storage batteries using an alkaline solution. Not more than 5 per cent. of the bulbs examined shall give less than 250 hr. life with acid batteries, nor less than 170 hr. life with batteries having an alkaline electrolyte.

If the number of working days in the month is taken at 25 and the number of shift hours at 12, there would be 300 hr. during which the lamps would be in use in any month. Under such circumstances a bulb of 300-hr. capacity would have to be renewed every month, or 12 times in a year. If the price of each bulb is 36c., the cost per annum would be $4.32 per lamp per year. This maintenance would be far too heavy, as it covers the cost of bulbs only.

Over 600 Hr. of Burning per Bulb

At Crow's Nest the total number of approved bulbs received up to Sept. 18, 1915, was 995. Some of these of course were mounted in new lamps and others were placed in stock. On Sept. 18 there were 157 bulbs in reserve. Thus there were 838 bulbs broken, consumed or in use. The miners had broken 218 bulbs in service. It seems conservative to rate half of these as burned-out bulbs. The bulbs were destroyed by the mishandling of the miners, but not being new they would not have burned as long as bulbs from stock, even if they had not been injured. The loss from negligence can therefore be calculated as being equivalent to 109 bulbs.


LAMP RACKS AND TENDING TABLES AT CROW'S NEST

This can be deducted from the loss as previously obtained, leaving 729 bulbs destroyed by burning out. The same assumption, that the bulbs when unbroken have still half their life unexpired, may be applied to the bulbs in the lamps. There are 250 of these. It will be assumed that their life is equivalent to that of 125 bulbs fresh from stock. These bulbs can be deducted from the number already obtained and the bulbs actually consumed will be 604.

The number of lamp shifts of these 604 bulbs is 34,419. Each shift is taken at 11 hr., giving 378,609 lamp hours, or 627 burning hours per bulb, or 57 shifts of 11 hr., instead of the minimum average as required by the bureau for an acid battery, namely, 300 hr.

Assuming the number of shifts in a year to be 300, then 5.26 bulbs will be needed per year, which at 36c. would entail an expenditure of $1.89. Where the Mannesmann Light Co. maintains its lamps at so much per shift it stipulates that the operating corporation shall charge its miners with the net amount of all material destroyed through the carelessness of these employees. It is fully justified in assuming therefore that the estimates of lamps broken by miners is not in any way excessive.

Cable Breakages May Be Further Reduced

The cable used is marked as 5 ft. long. As a matter of fact it need only be 4½ ft. The additional 6 in. is added for conservative estimation. The cable is the one part of the lamp still furnishing a small problem to the manufacturers, and efforts are being made to solve it in a more satisfactory degree.

This is indeed the weak point in electric cap lamps; but the lamp firm to which we have referred has introduced at Crow's Nest a cable attachment which seems to remove this trouble, and about 50 per cent. less breakage has been experienced with the new cable equipment than with that on which the figures quoted are based. As soon as the practical tests now under way have been conducted for a sufficiently long period of time more information will be published.

MATERIAL DESTROYED BY MINERS AT CROW'S NEST MINE FROM MAR. 22 TO SEPT. 18, 1915

Period	Lamp Bodies	Lenses	Bulbs	Safety Devices	Lamp Holders
Mar. 22 to Apr. 30	1	5	50	1	1
During May	3	4	52	1	..
During June	..	3	45	..	..
During July	.	1	34	..	..
During August	1	6	23	1	..
Sept. 1 to Sept. 18	1	1	14	..	1
	6	20	218	3	2

According to observations made, a lamp cable is bent on the miner's back about 7,000 times during the length of a single shift. It is easy to understand therefore to what a severe service it is subjected. It is not so much the kind and quality of the cable which is in question. The important matter is the manner in which the cable is attached to the lamp and battery casing. The tests mentioned are being made from this point of view.

MATERIAL USED IN MAINTAINING AN INSTALLATION OF 250 LAMPS AT CROW'S NEST MINE OF THE KEYSTONE COAL AND COKE CO., GREENSBURG, PENN., FROM MAR. 22 TO SEPT. 18, 1915

	Spare Parts Used	Mar. 22 to Apr. 30			During May			During June			During July			During Aug.			Sept. 1 to Sept. 18			
		Pieces	List Price	Total	Pieces	List Price	Total	Pieces	List Price	Total	Pieces	List Price	Total	Pieces	List Price	Total	Pieces	List Price	Total	
1	Lamp bodies	3	$0.70	$2.10	5	$0.70	$3.50	2	$0.70	$1.40	..	..	..	7	$0.70	$4.90	2	$0.70	$1.40	1
2	Lenses	8	.20	1.60	3	.20	.60	1	.20	.20	2	$0.20	$0.40	8	.20	1.60	2	.20	.40	2
3	Rubber rings for lenses	1	.10	.10	1	.10	.10	.	..	..	..	..	..	105	.10	10.50	..	..	..	3
4	Bulbs	97	.45	43.65	105	.45	47.25	99	.45	44.55	83	.45	37.35	45	.45	20.25	16	.45	7.20	4
5	Bulb springs	1	.05	.05	1	.05	.05	..	..	..	..	..	..	..	..	..	..	..	..	5
6	Safety devices	6	.25	1.50	5	.25	1.25	..		..	..	..	..	..	..	..	1	.25	.25	6
7	Connection pieces	5	.20	1.00	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7
8	Rubber washers		..	..	1	.02	.02	..	..	..	..	..	..	..	..	..	..	..	..	8
9	Lamp holders	1	.15	.15	2	.15	.30	..	..	..	..	..	..	5	.15	.75	3	.15	.45	9
10	5 ft. cable lengths	7	.25	1.75	221	.25	55.25	233	.25	58.25	309	.25	77.25	169	.25	42.25	84	.25	21.00	10
11	Leather sleeves		..	..	..	..	..	4	.35	1.40	..	..	..	..	..	..	..	..	..	11
12	Aluminum shields	2	.10	.20	2	.10	.20	..		..	4	.10	.40	..			..	..	..	12
13	Casings with belt hook	..	..	..	..	..	..		..	..	..	..	..	15	.51⅔	7.75	..	..	..	13
14	Hooks for locks	..	..	..	..	..	..	..	..	..	2	.25	.50	3	.25	.75	..	..	..	14
15	Rubber corks with pipe	3	.07	.21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15
16	Rubber corks without pipe	4	.05	.20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	16
17	Celluloid covers of casings	..	..	..	..	..	..	..	..	..	3	.30	.90	..	..	..	..	..	..	17
18	Celluloid covers for gas chamber	..			..	..	..	1	.05	.05	..	..	..	..	..	..	..	..	..	18
19	Celluloid vessels	..			..	..	..	..		..	4	1.05	4.20	..	..	..	..	..	..	19
20	Pints of celluloid paste			..	..	..	..	..		..	1	1.75	1.75	..	..	..	1	1.75	1.75	20
21	Carboys of acid	1	2.20	2.20	..	..	..	1	2.20	2.20	1	2.20	2.20	1	2.20	2.20	1	2.20	2.20	21
	Total			$54.71			$108.52			$108.05			$124.95			$90.95			$34.65	
	Delivered lamp shifts			6,434			5,813			6,561			6,047			5,905			3,659	

Lamp-Tending Charge Less Than 2c.

It is necessary to consider not only cost of material but the labor and amortization charges. The experience of the Mannesmann Light Co. has been that one man can handle at least 150 electric safety cap lamps and give perfect satisfaction. Thus 300 lamps could be tended by one lamp master and his assistant. If these men are paid $3 and $2 a day respectively, and 25 days are figured to a month, the monthly payroll will be $125. If they work to capacity—that is, charge and clean 300 lamps for each of the 25 shifts—each lamp-shift labor charge will be 1.66c., or about 1¾c.

All Costs but Those for Current Total Less Than 5c. a Lamp Shift

In figuring the battery maintenance charges no consideration has been given to battery renewals, because in the six months during which the lamps have been installed at the Crow's Nest mine the batteries have not needed any repairs. But the time will come when they will, so it is well to be safe and to double the repair bill arbitrarily, making that item 2c. Adding the labor charge to this, the cost of operating is 3.7c. per lamp shift.

BATTERIES RECEIVING RENEWING CHARGE

The custom in most American coal mines is to charge the miner at least 5c. for the use of a safety lamp during one shift. Taking 5c. as the charge, the balance left for the operator would be 1.3c., and this would have to cover amortization and interest on invested capital. A small lamp plant of 300 lamps running 250 shifts per year would give a total of 90,000 lamp shifts, which at 1.3c. would provide $975 for amortization and interest.

Such a plant for the Manlite lamps, including the lights themselves, would cost about $2,750. An amortization charge of 30 per cent. and 6 per cent. interest would amount to $962.50. So it will readily be seen that the electric cap lamp not only gives a good light and assures safety from gas and other causes, but also is at 5c. per lamp shift by no means an unsatisfactory investment. To the advantages of cap lamps already mentioned may be added those of cleanliness, lightness and general availability.

Self-Acting Ventilation Door

By J. F. K. Brown*

SYNOPSIS—A type of door is here described which is opened by the car in the opposite direction to that in which the car is moving. It closes under the influence of gravity and the air current.

Conditions sometimes arise in connection with the problems of ventilation in collieries where the use of a self-acting ventilation door would be of material service. The following description may therefore prove helpful.

Doors of this type are in daily operation in the Hamilton Palace colliery of the Bent Colliery Co., situated in the Lanarkshire coalfield of Scotland. The ventilation of the Nos. 1 and 2 mines is rather peculiarly arranged, in that while the No. 1 mine is the return air mine, No. 1 shaft is the downcast, the reverse being the case with No. 2. This makes it necessary to have every road leading from the bottoms of Nos. 1 and 2 "doored" off, since otherwise the air would short-circuit from the one shaft to the other without getting near the workings. Furthermore, the doors have to be so constructed as to perform their duty thoroughly, as the two shafts are situated at one end of the leasehold and the workings extend for 2 mi. from the shaft, with no other air outlet. The course of the air in the mines is down No. 1 shaft and through special air courses to the main roads leading from the bottom of No. 2 shaft (the doors preventing the return of the air direct to No. 2), thence through the workings of the No. 2 mine, up to the No. 1 seam above, through No. 1 workings and back along the main roads almost to No. 1 bottom, there being again diverted by doors and directed to the No. 2 shaft and the fan.

This arrangement creates a pressure inward in the No. 2 shaft bottom and outward in the No. 1 shaft bottom. As coal travels in and empty cars out from each shaft, it follows that some of the doors have to be opened by cars traveling in the same direction as the pressure exerected on the door. In other words, the doors have to be opened against the air pressure before the cars can pass through them.

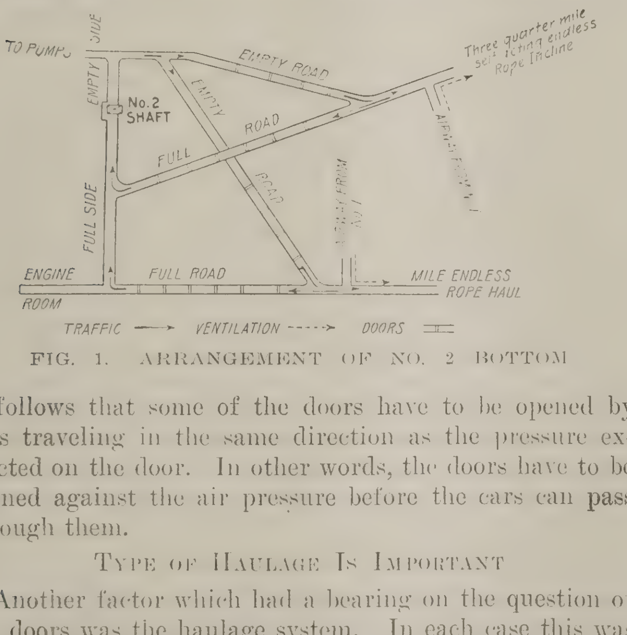


FIG. 1. ARRANGEMENT OF NO. 2 BOTTOM

Type of Haulage Is Important

Another factor which had a bearing on the question of the doors was the haulage system. In each case this was of the endless-rope type, and thus a slow-moving but steady stream of cars passed through the doors coming at fixed intervals. The cars are spaced at 40-ft. intervals on the rope and the doors at a distance apart either greater or less than 40 ft., depending on the condition of the roof. Such an arrangement of spacing provides against the possibility of all the doors in any one road being opened at one time and so short-circuiting the air.

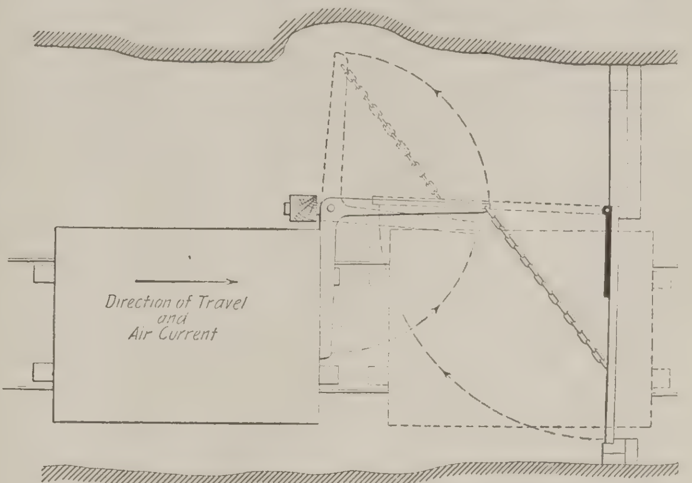


FIG. 2. ARRANGEMENT OF DOOR AND DOOR-OPENING DEVICE

Fig. 1 shows the layout of the No. 2 bottom, the position of the doors, direction of the traffic and the direction of the air current. One of the haulages feeding the No. 2 shaft is a ¾-mi. self-acting endless rope, the other being a power-driven endless rope. The two combined pass daily through the doors on both roads a total of approximately 900 tons of coal—1,400 cars. About the same tonnage goes to the No. 1 bottom.

The actual arrangement of each door is clearly seen in Fig. 2. It consists simply of an ordinary swing-door, to which is attached a home-made device by means of which the door is opened by the advancing car before passing through. The door is opened by a flat-iron bell-crank, to one end of which a short piece of chain is attached, which is connected to the door at a point about three-quarters the width of the door from the swing or hinge side. The other arm of the bell-crank is free and acts as the operating lever. An upright post placed just clear of the passing cars has a pin fixed in it, to which the bell-crank is hung at such a height from the floor as to catch the cars fairly in the middle. When the door is shut, the chain attaching the lever to the door is drawn almost tight, which causes the other arm to assume a position roughly at right angles across the track. On the approaching car coming in contact with the lever it first tightens the chain and then, as the pressure due to the haul rope increases, the door is "jerked" open and swung clear of the track. The relative position of doors, lever, post and cars is so arranged that, in opening, the door swings into the space formed by the two arms of the bell-crank, and thus the operating arm coming between the car and the door serves as a guide, holding the door back while the cars pass through. Both the post to which the lever is attached and the door posts are set at such an angle from the perpendicular—leaning toward the track—that just as soon as the car passes, the operating lever begins to swing toward the center of the roadway, bringing the door with it, aided by the "set" of the door itself. Then the air pressure catches the door and shuts it tight.

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THESE DOORS ARE EASILY INSTALLED

A door of this design has the advantage of being exceedingly plain and is simple in construction and easily repaired. It can be successfully operated on any mechanical haulage road where the rate of travel is low, but is useless on high-speed "trip" systems. With the constant banging to and fro it may be thought that these doors would quickly get out of order; but if strongly built in the first place and properly cared for by the trackmen they will give long service, even though the installation is a heavy-traffic proposition.

When such doors are erected on a road used as a traveling way as well as a haulage road, caution must be observed when passing through them. When going with the traffic, never pass immediately in front of a car, but always behind it; while if going against the traffic, always wait at each door till a car passes, then slip inside before it closes, and watch the lever inside as it comes back. The "kick" of the lever, coming just about at the height of the knee, and the sudden alarming swing of the door itself have been responsible for careless men sustaining broken legs and broken heads.

This fact shows that this type of door does not open slowly and gently. On the contrary, the process is extremely rapid and abrupt. At the moment of touching the lever, the car, running easily on the rope, seems actually to stop, but as the rope travels on, the pressure exerted by the car on the lever rises rapidly, until the door is flung against the lever, which draws it open.

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Extracts from a Superintendent's Diary

Occasionally I take a day or two off and travel forth to see what my neighbors are doing, and how they are doing it.

When I was young at the superintendent's game I felt that every minute of my time belonged to my company and nothing could induce me to leave my work; as a result I soon got into a rut. Fortunately for all concerned, our manager took me in hand before it was too late and gave me a broader vision.

Such trips not only keep me out of the ruts, but do as much for the men under me. I find that if I am on the job constantly, certain subordinates depend too much upon my suggestions in making decisions and in time lose their initiative. Naturally, then, if I get into a rut they follow. If they are left to themselves now and then, however, the effect is almost magical. When I return I find that they have taken things into their own hands, which is exactly what they are paid to do, and the company gets the benefit of their experience, which it very much needs.

The receptions which I receive at the various camps differ considerably, and this uncertainty adds to the pleasure of each adventure. Some superintendents are willing and anxious to compare methods, cost sheets or any other phase of their activities, while others seem to think that their directors desire the strictest secrecy, and when one attempts to draw them into conversation they become as uncomfortable as if they were sitting on pins and needles.

Today I paid a visit to a camp presided over by a superintendent of the taciturn variety, and just because I happened to be in the right mood I kept him squirming most of the time.

During the past two years the coal-mining companies of this state have been trying to get together on some plan that would insure a more permanent and equitable system of taxation. A few companies (the company that owns the mine that I visited today being of the number) have refused to take part in the conferences because they have been able, by playing politics, to keep their assessment on a very low basis. Naturally they are afraid that a tax agitation might make matters worse for them instead of better.

I tried to draw that superintendent into a discussion upon the values of mineral lands in our state, but he dodged the questions that I put to him persistently and completely, and finally refused point-blank to be drawn into conversation at all. While he was dodging the questions I raised about values, etc., he kept trying to switch the conversation into other channels, and unconsciously he let slip a good deal of information that I was anxious to secure, which under other circumstances I would not have obtained.

Although men of his type are not common in the coal business, still I meet a great many mining superintendents who are so thoroughly selfish that they do not feel called upon to give to others the benefit of their experiences. If they tackle something new with disastrous results they keep the fact from their neighbors and leave them to find out for themselves.

Such men do not realize that in turning their backs upon their neighbors they also close their eyes to progress, and in time they must find themselves rolling along in a wide, deep rut that turns neither to the right nor to the left until it ends at a stone wall.

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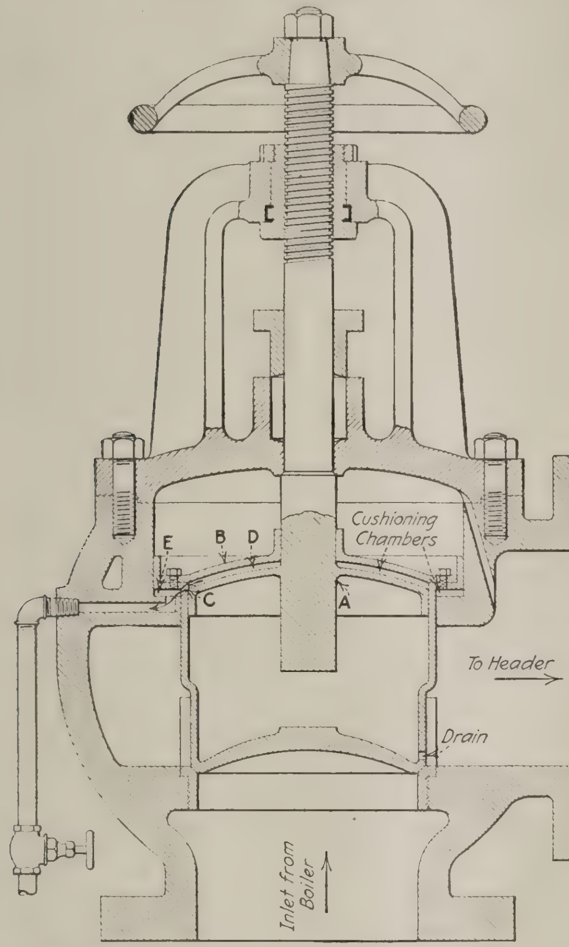
Improved Automatic Nonreturn Stop and Check Valve

The Golden-Anderson Valve Specialty Co., of Pittsburgh, Penn., has just placed on the market what is called its type B automatic cushion nonreturn valve, a cross-section of one variety of which is here shown.

It is well appreciated by steam-plant designers and operators that a stop or check valve should be placed in the discharge line from each boiler to the main steam header. This is to prevent backflow from the header to the boiler if the pressure in the boiler falls below that in the steam line. Such a valve is also useful when a boiler that has been out of service is being fired up and placed in operation, or when a pipe breaks, a tube bursts or a rupture of some other variety takes place in a boiler. In such an emergency a nonreturn valve in the steam line protects the entire plant, since the valve closes and will not permit the contents of the other boilers to escape through the rupture.

Furthermore, this type of valve placed immediately on the boiler nozzle or outlet will not permit the turning of steam into a cold boiler, and consequently acts as an additional protection for men working in it.

A double corliss dashpot method of cushioning is employed in this valve. This prevents hammering or pounding of the disk or plunger on its seat. There is only one moving part to the valve, the piston *B*, which is always in perfect alignment with the seat, regardless of the piston's position. When the steam pressure raises the valve *B*, the spaces *D* and *E* are instantly filled with steam, as well as the area about piston *B*, so that the valve is perfectly cushioned in opening and closing.



THE NEW VALVE SHOWING THE INTERNAL ARRANGEMENT AND THE SMALL VALVE FOR TESTING

These valves may be tested at any time desired without interfering with the operation of the plant. To prove that they are operative and would respond instantly in case of accident, the small valve in the steam line shown in the drawing may be opened. This valve, which may be placed at any convenient point, connects with chambers *E* and *D* and acts as a pilot valve, the opening of which closes the automatic valve. Closing the small hand valve reopens the nonreturn valve. This feature enables the attendant to determine at once whether the valve is in working order. It is not necessary for him to climb on top of the boiler to close or open the nonreturn valve by means of a handwheel.

These valves are of heavy construction and are correctly designed and properly finished. They are guaranteed not to chatter, hammer or stick, and to be positive, durable and economic. They are made in three general types—elbow, angle and globe—of cast iron, semisteel or cast-steel body and bonnet, with bronze, nickel bronze or monel-metal contact faces.

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Pages from a Miner's Notebook: Toll of Goodfellowship

A young fellow was fired today. He came here several months ago, a promising sort of boy—he is scarcely twenty-four—and got a job helping on a machine. He was energetic and willing and for the first few weeks performed his work capably and to the satisfaction of the mine foreman. But he got in with the wrong crowd.

There is a bunch of young fellows here—machine runners and helpers and motormen, single men staying at the hotel—who find in the conviviality of the saloon their recreation. Some of them can afford to spend their money freely, and some of them have constitutions that can stand the work in spite of the drink-destroyed tissues of the body. This boy could do neither.

His work suffered. His place on the machine was taken by another man, a Slav, much to the disgust of the runner, who claimed he had rather have a "good fellow" for a helper than a "surly dago." But despite his objection he must realize that he is cutting more coal since the change. The boy was given a chance on the motor and for a time it looked like he would make good. But his first pay started him again on the "goodfellowship route," and in another 10 days he was taken off the motor and put to cleaning track. He was then a common laborer in an unresponsible position.

During the day, when all was activity about him, he stood up to his work, but a breakdown forced a number of men to the night shift, he among them. The first few nights passed all right; but his was not one of those constitutions which can stand a night's work after a day's carouse with other good fellows in the saloon, and in a few nights his work dropped off.

Last night he was found by the pitboss asleep. Nature will not stand abuse from even the princes of goodfellowship. The tired nerves and muscles demanded a rest and took one.

He was given his time, and to put the crown on his reign of good fellowship it was found that his time check was not sufficient to meet his board bill. He explained his predicament to his friends in the saloon, but they only laughed. The manager of the saloon offered him enough to pay his fare to another camp.

He was a good fellow. He was also a man. He learned in that hour the price of goodfellowship, and like a man he went to his boarding house, explained the situation to the motherly old lady with whom he boarded, offering to send her the money due her as soon as he obtained employment—almost cried when she told him that would do—and a few moments ago disappeared over the hill with his little bundle of pit clothes on a stick over his shoulder—walking, walking with eyes straight ahead toward the nearest camp 12 mi. away.

As I passed the office I heard the superintendent at the telephone asking the superintendent of that nearest camp to give the boy a job if there was any possible chance. "I believe he'll keep off the primrose path from now on if he is given a chance," said the superintendent just before he hung up the receiver.

Dangerous Wiring in Mines

By H. J. Johnson*

I have read excellent articles at different times on safe methods of mining, but I have not seen much about mine wiring. Under certain conditions, which I shall try to explain, electricity is dangerous in mines, especially where gas is encountered in considerable quantities.

To make my position clear, I will start at the bottom. First, what is electricity? Any textbook on this subject will say in effect: "We do not know what electricity is; we only know the effects due to it and the laws which it follows." The law of water flowing through a pipe is analogous to that of a current of electricity flowing along a wire.

Take for illustration a tank filled with water, located on the top of a mountain, with pipes leading from it to dwelling houses in the valley. If we set a bucket under a spigot in one of these houses and turn the spigot on, the water flows with considerable force and soon fills the bucket. Now, suppose we place an obstruction in the pipe between the tank and houses, and then turn the spigot as we did before. The water will flow slowly and the bucket will be long in filling, due to the resistance offered to the flow of the water in the pipe.

Now, consider the flow of an electric current along long lines of trolley and machine wire in mines. It takes pressure or voltage to force the current along these wires. Ohm's law states that it takes 1 volt to force a current of 1 amp. through a resistance of 1 ohm.

Let us see how a great number of mines are wired today. We connect a feeder cable to a circuit-breaker in the power plant and set this breaker to carry the entire load of the mine, consisting of haulage motors, coal-mining machines, pumps, etc. We then connect this feeder to the trolley wire at the mine entrance and run this trolley wire for a mile or more underground, connecting to it machine wires, pump wires, etc. Some of these conductors are small and have a high resistance. Furthermore, track-bonding is none too good in mines.

Suppose one of these machine wires should fall and cause a short-circuit. The resistance of the wires, combined with bad track bonding, would cause the voltage to drop so low that it would not allow enough current to flow back and trip the circuit-breaker at the power plant. I have seen coal-machine cables short-circuited and catch fire, and the machine helper compelled to run down to the heading and pull his cable off the heading wire. Had this room contained dangerous gas there would probably have occurred an explosion.

I have seen a cable burn completely while coiled on its reel. The current was cut off at the power plant, due to a breakdown, and the runner, learning that it would be off for several hours, went home, leaving his cable connected to the heading wire. When the current was turned on again, this cable short-circuited from some cause and burned together with the wooden frame of the reel.

This mishap was the result of having a high resistance line and bad bonding on the return rail. The voltage was reduced so low that it could not force enough current back to the power plant to trip the circuit-breaker. If there had been gas in the mine it might have been blown up and no one would have known the cause.

The remedy for such conditions is to have a magnetic, low-voltage switch installed on each machine and pump line, so as to protect that particular circuit. The use of open faceplate starting boxes for pumps and mining machines, as well as the employment of open motors in gaseous mines, should be avoided, since a spark from either may cause an explosion.

While we may not have an explosion from these causes, the unusual happens sometimes and proves disastrous. An example of such an occurrence was the New York subway accident of a few months ago, in which as the result of the short-circuiting of a cable about two hundred persons were injured.

Car-Operated Mine Door

By M. M. Haley*

This door is composed of two distinct parts or shutters which stand with ends exactly opposite each other when in a closed position. When opened by either train or

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*Gary, W. Va.

*Sturgis, Ky.

Ballads of a Coal Miner--VII

Written Expressly for Coal Age · **The Explosion** · *By* Berton Braley

FORTY *dead—an' mebbe more,*
Though the special rescue corps
Fought in fumes that burn an' choke—
Fought in gases an' in smoke,
Fought with all their strength an' breath
In a losin' fight with Death.

Forty dead: Good men an' true
On the job they had to do,
Killed 'way down there in the murk
As they done their daily work.

They was soldiers, sent to fight
Nature, an' to bring to light
Coal that moves the world along—
Soldiers brave an' soldiers strong,
Soldiers that to death was hurled
In the service of the world.

It was fate that they should die? Well, I sort of wonder why.
You kin talk to me all day, but when you git through I'll say,
"Forty dead: Good, sturdy men," an'—I'll ask you "Why?" again.

man the shutters take on a parallel position extending in the same direction as that in which the force is applied. The door is in the entry through which the electric locomotives travel to and from the parting. Regarding the speed of the train when passing through I believe 5 mi. per hour would be safe.

When a car bumper or locomotive strikes the buffer block *b* near the bottom of the door, the shutters open, at the same time pulling on the closing cords *c* on one side and slacking off on the other side.

The 16-lb. steel rails *r* are spiked in the middle on their sides to the joint post *j*, while a small turnbuckle connects either end (Fig. 2) to the bell-cranks *a*, from the other arms of which the cords *c* extend to the shutters. The ends of the spring rails rest on the stop blocks *l*; this insures a constant and steady tension on the shutters.

The armor plate *m* is placed at the proper elevation to strike the bolts and irons on the car bed and thus protect the door.

Fig. 3 shows how the space for the trolley wire is taken care of at *x*; while in this figure *c* indicates I-bolts for the pull rope connections. The bell-crank post *v* and the hinge post *j* are spaced and tied at the top by the stringers *k*. Brattice boards *w* (Fig. 3) may be placed on 2x4 in. studding on the outside and be made flush with the hinge post *j*. The shutters are made of 1 in. boards nailed at right angles, while the hinges *z* are made of ½x2½-in. iron and 7x¾-in. I-bolts with ¾-in. pins.

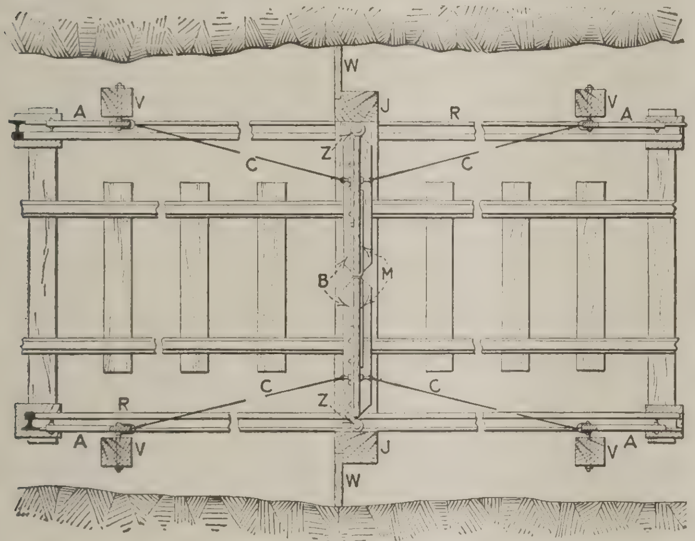

FIG. 1

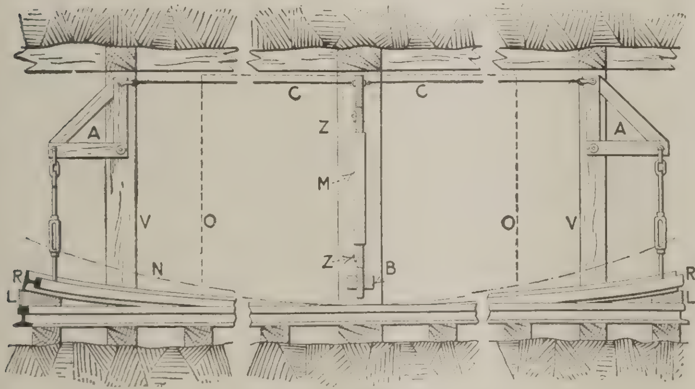

FIG 2

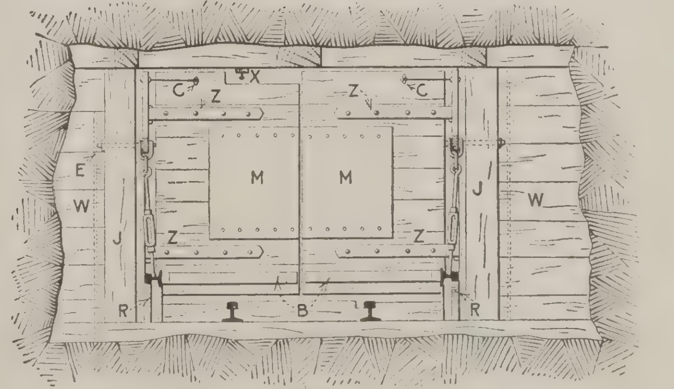

FIG 3

FIGS. 1, 2 AND 3. SHOWING ARRANGEMENT OF DOORS, CABLES, POSTS, SPRING-RAILS, ETC.

All openings around the door can be closed with tarred brattice cloth, with its edges nailed at dotted lines *e*, (Fig. 3). The arc *n* (Fig. 2) shows the position of the spring rail *r* when the shutters are opened full width, while the dotted lines *o* indicate the edges of the shutters when in this position.

This door is cheaply constructed and can be put together by any mechanic who can drive a nail. The necessary material also can be easily secured around any coal mine.

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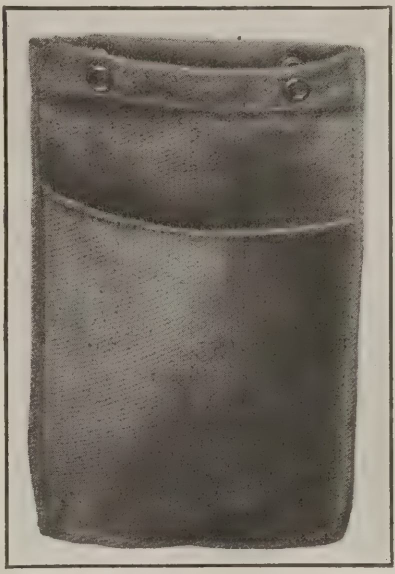
Bags for Dynamite and Fuse

Wallace McKeehan, safety inspector of the Copper Queen Consolidated Mining Co. and a leading member of the American Mine Safety Association, with the approval of the central safety committee of the company, recently designed the bag here illustrated for the carrying of powder and fuse. The sack is made of heavy jute and is sewn with flax thread, so that it is exceptionally durable. From 50 to 70 sticks of dynamite can be carried in the bag proper, the fuse being placed in the outside pocket. Large brass eyelets are fastened into the top of the sack for convenience in handling and carrying. It was noted by the management of the Copper Queen mines that all dynamite when handled in quantities of less than a box was carried in any way which would suit the convenience of the miner, it generally being tied together with a piece of fuse. Capped fuse was carried in the miner's hand or wrapped around his hat or thrust loosely in his shirt front. All these methods were exceedingly dangerous, and since the bag has been introduced these bad practices have ceased. The sack is made by the Bemis Bros. Bag Co., St. Louis, Mo., and sells for 35c. in 100-bag lots. The size of the bags is 15x22 in. outside measurement.



BAG FOR EXPLOSIVES

The Labor Situation

SYNOPSIS—Anthracite operators fear that they cannot transfer any large rise in wages and charges from producer to consumer because of competition of bituminous coal and coke. In the Hocking Valley district the miners are beginning to realize that their agreement of July 3, 1914, will have to be obeyed. John D. Rockefeller, Jr., visits his miners and has a good time, but lady politicians and the organization are yet likely to spoil his trip. He declares for the open shop.

The anthracite operators do not feel that they are masters of the situation and doubt very much whether they will be able to make the necessary increased charges to the consumer if they should accede in full or in any large degree to the demands of the miners. It is certain that of late years bituminous coal has been proving an important rival in the market, because the power houses have learned how to use it without making sufficient smoke to draw down official reprobation. In fact it has generally been noted that New York City air has not the clarity it once had because of the extensive change from hard to soft coal.

Of What Value is a Hard-Coal Operator's Fiat?

One of the anthracite operating heads has been interviewed by the Wilkes-Barre "Times Leader," and while he is apparently willing to concede that an increase of wage is indicated by the increased cost of living he is strongly against such wage advances as the miners demand. He declares that the price of anthracite is not determinable, as some think, by the fiat of the seller, because byproduct coke has weakened the market. He says:

"Coke has become the great competitor of anthracite. By the Solvay process it is not only possible to market coke, but the ovenmen can break it down, crush it and then press it into prepared sizes similar to those in which anthracite is delivered to the market.

For example, in the city of Rochester alone the sale of hard coal has declined 30 per cent. in the last three years. In Chicago, Cincinnati, and other cities, formerly heavy users of anthracite, that fuel is being rapidly displaced by coke. In those commercial centers bituminous coal is used for gas, and the coke, which is one of the byproducts, is marketed for a low price. Our company has lost sales in New York State amounting to thousands of dollars because coke has been substituted.

"In Syracuse or Rochester the cost of anthracite is about $6.75. These coke people have gone to users of our product offering coke for $5.50 a ton. They also guarantee that it will show as great or greater efficiency as fuel, far less ash than anthracite and no smoke. They establish a personal service, much as the automobile manufacturers have done. When a man buys their coke they give him a booklet of instructions telling him how to burn it. Then the agents call later and note the efficiency obtained. If too much has been burned, steps are taken to correct the fault. This supervision of the purchase continues until such time as the former buyer and user of anthracite is convinced that the substitute is as efficient as coal. With vastly cheaper cost there is only one answer: We don't sell him any more anthracite."

The operating head then goes on to state that the opposition to the Coal Tax Law was based on the fact that the anthracite producer felt that he had lost his grip on the market and could not continue to sell his product if the cost of it were unduly increased.

Hocking Valley Operators Hold Miners to Their Promise

To remove any misapprehension as to the standing of the Hocking Valley operators it would be well to quote in full the clause in the agreement inserted by them when the contract was made on July 3, 1914. This clause was given full assent by the miners and is binding on them morally and has as much legal force as any contract can have which is made with an unincorporated association. The clause to which reference has been made is: "The operators in accepting the miners' proposition of this date do so with the understanding, and upon the representation of the United Mine Workers of America, that the scale of rates and the conditions are to be made to apply to all subdistricts of the state."

Even union officials concede that in order to induce the eastern Ohio operators to agree to the scale rates imposed on all operators in Ohio, concessions in the "conditions" under which the mines were conducted were made to the eastern Ohio operators.

The miners in the Hocking Valley are beginning to realize that they must concede these "conditions" to the operators, and a meeting of subdistrict No. 1 of the United Mine Workers of America was called to meet at Athens on Monday, Sept. 27, by Sanford Snyder, president, and Conrad Wein, secretary-treasurer of the subdistrict.

This meeting was called to discuss the demands of the Sunday Creek Coal Co. It is said that the members of the union are urging their officials to make the concessions demanded. The miners in the Hocking Valley and their families are much impoverished, and ways and means of relieving the destitution will also be discussed. There are approximately 8,000 miners in the subdistrict.

The Ohio Utilities Commission has postponed its hearings on the coal-freight rates. They were to be resumed Oct. 5, but upon the application of the railroads they have been postponed until Oct. 12. In the meantime the experts engaged by the commission are continuing the work of examining the books and documents of the Hocking Valley Ry. The books of the Toledo & Ohio Central Ry. will also be examined.

Miners Are Siding with Operators in West Virginia Just as They Did Recently in Ohio

The increase in freight rates proposed in West Virginia is making much stir throughout that state. The labor unions are strongly opposing it. Local Union No. 2925 at Coal Fork, W. Va., has passed resolutions against the increased rates. Thomas Haggerty, executive board member of the United Mine Workers of America, openly denounces the increase. In fact the union in West Virginia is solid with the operators of that state in condemning the change in railroad rates which has been made to please the union and operators in the State of Ohio.

Mr. Haggerty's remarks are interesting and would have an immense validity were it the duty of the United States Government to see that the miners in any one part of the country could compete with those everywhere else. His argument could be fortified by taking the freight rates to the States of Washington or Colorado, and he could then prove that the miners of West Virginia would have to work for nothing or less than nothing in order to enter the Western market.

He says: "If the new railroad rate is put into effect the Kanawha and New River fields will be forced to close down altogether, but the Fairmont, Guyan, Big Sandy and northeastern Kentucky fields might be able to pull through because of their low production cost. None of the last-named sections have been organized and the men are compelled to work for a mere pittance. If the railroads achieve their purpose we never will be able to unionize those fields, because the production cost will be so great it would be an economic impossibility to get a wage increase.

"In the Kanawha field the limit already has been reached. The operators here now have to carry at least a 4c. net differential to compete in the Western market. If anything was added to that they would have to suspend operation. The cost of undercutting and loading coal in the Pittsburgh bed of Ohio is 47c. per ton. Here the same cost is only 32½c., and adding the 25c. differential gives a total charge of 57½c., leaving a net differential of 10½c. in favor of Ohio. In No. 5 seam the undercutting and loading cost is 27c. per ton, to which must be added the 25c. freight differential now in force. This makes No. 5 coal cost 52c.; while that in Ohio is only 47c. No. 2 gas coal is mined and loaded for 26c. per ton, and when burdened with the freight differential costs 51c. So even in this case also there is already a differential of 4c. in favor of Ohio.

Miners Want the Operators to Combine to Raise Prices

Mr. Haggerty announced further that the international executive board of the United Mine Workers of America, at its annual meeting in Indianapolis, appointed a committee composed of John T. White, Frank Hayes and William Green, president, vice-president and secretary-treasurer respectively of the union, to appear with the representatives of the operators before Congress next winter to secure an amendment to the Sherman law, by which the operators may be allowed to combine and ask for a price for coal which would guarantee better wages to their workmen.

An attempt is being made to show that the railroads in Ohio will lose in business more than they will gain by the increased rate, but they will console themselves by remembering that it will not hurt them as much as would a 15c. drop in the freight rates in Ohio, which appears to be the alternative. In all probability the increase in West Virginia will stave off the decrease in Ohio, as the railroads purposed when they asked for an increased rate.

There is a threat to bring Ohio to terms by putting a heavy tax on West Virginia gas. This would be only another gift to the Ohio coal producers and another blow to the West Virginia operators and population. An embargo or an export tax is always an unfortunate form of revenge.

Speaking at the Rotary Club in Zanesville, T. A. McIntire, a wholesale coal dealer, said that Columbus is using 70 per cent. of outstate coal, Newark 43 per cent., Cincinnati 92 per cent., Dayton 78 per cent. and Cleveland and Toledo 82 per cent. In 1911 75 per cent. of the coal hauled by the Pennsylvania R.R. was Ohio coal. Now less than 25 per cent. is from that state. In that same year 43 per cent. of the coal carried by the Baltimore & Ohio R.R. was from Ohio, and now 98 per cent. of the coal comes from other states. Ohio was third in coal production in 1911 and now is fifth.

The Mound City Coal Co. at Moundsville, W. Va., has been idle since Sept. 15, being apparently unable to pay its men for lack of funds. The men have engaged J. Howard Holt as counsel to bring proceedings in bankruptcy.

Order of Court Permits Miners to Pay Check-Off to Anyone

An order of the court in the case of Thomas Cairns, president of District No. 17, against the Boomer Coal and Coke Co., has been entered upon agreement of all counsel. It provides that the check-off be paid to W. L. Wehrle, who is appointed a special receiver for the court. It further orders that any miners who may have heretofore authorized the Boomer company to check off money from their pay for the use of the union, may by written request withdraw that authorization for any union dues which may be, or which now are, collectible. Moreover, it gives the miners the right to have future collections for the check-off paid to themselves, or to such persons as they may severally designate. This right can be secured by an employee on written application to the Boomer Coal and Coke Co.

Apparently the miners in District No. 30 have won everything but their rights to what they have already paid. They are free to subsidize any organization they please from the present date onward. .

In Iowa a coal miner whose leg was broken and back injured is trying to have 300 times his average working-day wage taken as the basis for his compensation. Senator John T. Clarkson, of Albia, is representing him. H. H. Stipp, the attorney for the coal company, is urging that, as the mines do not work through the whole year, a fifty-second part of the whole yearly wage should be the basis for figuring the monthly compensation. Richards, the plaintiff, worked only 224 days last year.

Mr. Rockefeller Declares in Favor of the Open Shop

As stated in last week's issue of "Coal Age," John D. Rockefeller, Jr., visited his employees in Colorado, and on Sept. 22 reached the village of Sopris, where he interviewed the children in the model school. At that same town Mr. Rockefeller inspected a number of disreputable houses built on the Colorado Fuel and Iron Co.'s ground by foreign miners. These the company purposes to buy and tear down, but the officials expect there will be some trouble, as the owners like to keep possession of their sad quarters, where the ground rent rarely exceeds a dollar a year.

At the same time the company feels that the presence of these unfit dwellings is discreditable to them and not to the advantage of their men, and they are determined to oust the tenants and replace the hovels with decent dwellings. After a visit to Morley and Starkville, the party returned to Trinidad and the trip to the mining camps was complete.

Everywhere he went Mr. Rockefeller was well received, the only displeasing event being an attempt on the part of a negro to talk him to death. On the 24th Mr. Rockefeller was at Pueblo going through the big mill and later he went through the company's hospital at Minnequa with Dr. R. W. Corwin, the white-bearded chief surgeon.

But the furies are following Mr. Rockefeller. The president and secretary of the Women's Justice League of Denver have met him and want him to meet the union officials. Mr. Rockefeller declares he is willing to meet anyone, but he has declared strongly for the "open shop." W. L. Mackenzie King, who is accompanying Mr. Rockefeller, has stated that the company is willing to meet its employees and arrange the terms of employment. He has declared that no discrimination would be made against the United Mine Workers, but he insists that the company will not recognize the union.

Ventilating in Rescue and Other Work

In *Coal Age* of Feb. 10, 1912, was published an illustration of an Austrian device for approaching mine fires—a collapsible air duct which could be strung from the roof and by which the foul air of combustion could be drawn away.

Of course given a slow fire and strong draft such as should be obtained by a small fan, an air duct of this type could be laid on the floor and would give satisfaction. Such a duct can be made of the "Flexoid" tubing manufactured by the Bemis Bros. Bag Co. The tube is made of heavy canvas reinforced with a composition which is forced into and becomes part of the texture of the goods. The usual sizes are 10, 12, 16 and 24 in. in diameter and from 100 to 200 ft. in length.

One man can carry a 100-ft. section on his shoulder. He can unload it wherever needed and then rapidly unroll it. It could be used not only in cases of fire fighting but also in rescue work. The recent tunnel driving at Archbald, Penn., through a rockfall to bring out four entombed men would have been more rapidly and healthfully performed had some such return been provided.

In many places it is necessary to drive ahead of return airways using air boxes, and they are often extended without any suitable means of securing ventilation. These tubes provide a speedy way of coursing the air, and one which can be readily dismantled for firing and renewed as soon as the blast has been fired.

The tubing is so air-tight that it has been used for temporary water diversion in bridge and culvert work. It is also furnished flat in large sheets for covering newly placed concrete. When the turbine is made to pass a sharp angle a few wood hoops will enable the pipe to be kept wide open, but on narrow turns the draft if reaching 3 in. of water gage will fully provide for this necessity. It is said that air can be delivered with a gage of 3 in. a distance of 1,600 ft. away from the blower, and the large sizes of pipe are delivering 10,000 cu.ft. of air.

Like many other devices used in the mines, Flexoid was first developed for use on the surface. Thomas Connor & Sons, of Greensburg, Penn., were constructing the Mill Creek sewer and the firm took up the matter with the Bemis Bros. Bag Co., of St. Louis, Mo., and the flexible conduit was the outcome. The cost of the duct is only about half that of galvanized-iron pipe, and being smooth and slick inside, air travels readily along it.

If the duct is crushed by a fall of rock or coal it will readily correct the deformation as soon as the weight is removed. A metal conduit will not do this. Moreover, a Flexoid conduit can be patched with needle and thread, whereas the repair of a severely dinged metal air duct is injured beyond any such renovation. Even if a metal duct can be straightened, the work takes some time.

Air ducts like these can also be used in shaft sinking. The need for temporary air conduits in many places has long been apparent, but as the methods provided are so cumbersome the tendency has been to put up with bad air, its risks and unhealthfulness rather than submit to the inconveniences involved in temporary provision for air coursing. The use of the Flexoid duct may hereafter make unnecessary our present masterful practice of watchfully waiting on nature.

Editorials

Do Safety Methods Succeed?

Increasing the number of men in a mine introduces a new risk, and for this reason there are occasional doubters as to whether the many safety inspectors will prove the value of their services. The late Fred C. Keighley used to tell one of his own unfortunate experiences in promoting safety. He was afraid his headings were too narrow and that some driver or workman would be pinched in the roadways, though they were by no means as constricted as might be found elsewhere. He had the work of widening almost done when the roof fell while one man was taking a side cut in a heading, and the very fact of securing safety added to the toll of victims.

It is therefore refreshing to hear about the successful campaign of the Susquehanna Coal Co., as related last Saturday by General Manager R. A. Quin at the Edgewood Park Meet of the Susquehanna and the Lytle concerns. The companies have 200 rescuemen drilled in the use of breathing apparatus, 325 first-aid men, not including those who after training have been advanced to higher position; 50 safety inspectors employed by the company to provide for the protection of their men and 475 persons employed as foremen and assistant foremen and in like positions, whose duties while partly economic are first and foremost to seek safety.

Roughly there are 1,000 men employed to save lives and 13,000 men to be protected. Mr. Quin declared that as a result of the renewed effort to guard their men from danger the fatal accidents in the first eight months in 1915 were only 17, against 32 in the previous year. He regarded it, as indeed all must, as a full recompense for the time and money expended.

It will be seen that there are 50 men out of the 1,000 whose sole work is safety. The lowered death rate is probably almost wholly their work, as the first-aid and rescuemen and the foremen of all kinds were as numerous a year ago as now. A saving of the lives of 15 employees by adding 50 men to the force is a considerable achievement, and it results largely from the fact that the men are as keen for safety as the company. The spirit has permeated through the collieries.

Morris Williams, the president, drew attention to the fact that safety-first, first-aid and workmen's compensation were achievements of the last ten years. The movements would have been declared chimerical a decade ago. He himself could recall the day when a man had his leg broken in a working place next to his own. The unfortunate miner was carried to his home by men who deemed themselves considerate. His bones grated on one another and his groans were frightful to hear. He was lowered down the breast and then loaded into a car, without any care. All sorts of mishandling were perpetrated by his well-meaning friends. It is different today, and the saving in life, in pain and in loss to the family and to humanity has been large.

As he said, the compensation movement is not less important. "Something which is the workman's right and always was his right," Morris Williams declared it, adding that it was "nothing but common justice." The future indeed looks bright. The spirit of the Susquehanna employees seems to assure us that none of the dreaded effects of compensation will be felt. Their willingness to do their part in safety-first and first-aid is a warrent that they will see that no man is compensated who does not need it.

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Is Our Conception of Mine Discipline Changing?

Some years ago a rather prominent student of sociology, speaking of a certain class of American citizens, said: "In their pulpits much is said of truth, honesty and virtue, but they really have no adequate conception of the meaning of these words."

When a coal man turns from the pressing questions of cost, efficiency and mining methods long enough to dwell upon the refinements of mining you hear more or less about "discipline." Probably no other word has been brought more into requisition in the discussions of remedial measures for all mining troubles, especially mine accidents. The lack of discipline, to judge from the remarks we hear, is the source of almost all our woes.

In actual practice you will find men advocating treatment of the miner varying all the way from serving him his breakfast in bed to "beating his head off with a pick handle." We often hear it stated that we are not able to get the "old-time" discipline. Many sighs are wasted for the fleshpots of those glorious days when the whip cracked and every fellow jumped. We are all about ready to admit that there has been a rather rapid breaking down of the thing we used to conceive as discipline.

It is a pathetic spectacle to see our old men of iron, with a few faithful old employees around them, striving to beat back to the standards of the early days. They probably feel that with the coöperation of their neighbors the tide might still be turned back. Perhaps. But their neighbors are newcomers, who think they have read the signs of the times correctly—the times when concession, compromise and defeat are reckoned with and the half loaf is not spurned.

With our National Industrial Commission disagreeing, and our former Secretary of State declaring that old systems of force have passed, those who employ men are frequently inclined to take stock of their individual fitness to survive. A man who has not physical courage is apt to vote for a system in which the minimum of that quality is required; but physical courage is still the mainspring back of all successful discipline, and always has been.

However, there is another quality—perhaps rarer in its combination with "nerve"—for which the present-day disciplinarian of mining men needs to search himself diligently; that is the willingness to risk a misinterpretation of his reservations pending the adjustments to the standards which the great public seems to be demanding. True, the only way you can prove that you will fight is to fight, yet there is some merit in being willing to withhold the proof. It cannot be denied that there is a general leaning toward the old "fight-at-the-drop-of-the-hat" conception of a successful disciplinarian; hence, because not much of that is done now there is a general feeling that we have no discipline.

If the old-time discipline is gone, what has become of the "punch" that went into the make-up of the old-time disciplinarian? One theory is that it has been "cast out" of the bosses by repression and has "entered into" the men. Anyway, anything like discipline according to old standards seems to require a higher order of nerve than ever before—a nerve that is able to get results while withholding the ocular proof of its existence.

While making inquiry after the "punch" that seems to have departed from the old order of things, how about the word "obey"? Perhaps if the conception of the meaning of mine discipline is changing, it is due more to the breaking down of the one vital element of discipline—obedience. The word has even been taken out of the marriage contract, and has become entirely bookish. We scarcely hear it any more, unless at a church service.

Is there any analogy between the industrial war that has been going on for some years and the European uprising against "militarism?" Is the leaning of labor toward the Allies any indication of this analogy? The old guard among the coal operators may resent their conception of discipline as being termed "militarism," but the press in some localities is even calling it "feudalism." Now the men who are trying to "meet the situation" find themselves wondering just what intermediate position they are to take in order to get that much-coveted condition spoken of as mine discipline.

The Department of Mines in one state, in its annual report and over the signature of its chief, says: "Strict discipline, vigorously enforced by the mine officials, would reduce the number of accidents at least one-half." Some time afterward a deputy inspector was examining a mine in company with the superintendent. A miner was discovered shooting off the solid in violation of law and was not prosecuted. At another mine the inspector made a report to his chief, stating that more than the legal number of men were being taken up on a hoist. The general manager, seeing the report before it was sent in, was indignant and addressed the deputy inspector as follows:

"All my employees have been instructed in the law in regard to the number permitted on a trip. This law has been incorporated in my mining rules and posted at the top and bottom of the plane. My superintendents and myself have something more to do than sit and count the number of men who get on the trip each morning. If you have observed any violation, your duty is clear, make the arrest, or modify your report."

No arrest was made. Probably in this instance it could be shown that both inspector and manager took extreme positions.

A third instance, however, shows a little plainer why mine discipline may be undergoing a change. Another state inspector was making his rounds in a mine when a shot was fired that contained about double the charge that was permissible. He was "horrified" and said: "That man should be discharged." The superintendent promptly discharged him. A few days later the inspector made a special trip to urge the man's reinstatement.

As most of us understand it, the objection to militarism is not its efficiency but the tendency to make it paramount. However, it seems that anything like discipline must partake of the qualities of militarism—that is, authority and obedience. Hence, the question arises, Is there not a tendency to eliminate authority and obedience from discipline; and in any conception of discipline without these vital elements, has discipline itself not been wholly lost?

Continuing the analogy, has not the conception of coöperation had much to do with the breaking down of the old standards? Why does not discipline mean the same thing when applied to an army of industrial units as it is supposed to mean when applied to soldiers, namely, the recognition of authority and obedience? There seems to be a double opposition to militarism—the legitimate objection to an efficient soldiery dominating civil affairs and the tendency to oppose the elements themselves that make for military efficiency. Coöperation is certainly a concomitant of the other virtues of great orderly movements, but with the passing of the elements of discipline, coöperation, when applied to mining, often has come to mean the elimination of the old-time discipline and the substitution of a system whereby those in authority, or supposed to be, first ascertain whether an order will be acceptable to the men and whether permission is granted to issue the order.

But the question propounded in the beginning was meant to bring out the point as to whether those who have so much to say about discipline are hypocritical, or have they really some new conception of discipline, as a product of concession, compromise and yielding, with the authority, the obedience and the "punch" left out. I think we can look squarely at the proposition without too much repining. When we advocate mine discipline, do we mean the old thing or something else? Did the writer of "I Didn't Raise My Boy to Be a Soldier" write against the domination of a military class or voice a protest against learning too much discipline? And is the popularity wholly one of war issues, or could it mean "I Didn't Raise My Boy to Recognize Superior Officers"?

It would be a beautiful sight in going through a mine to see drivers and slatemen and miners, all rushing to help put on a derailed car (or possibly more beautiful to see the track in such shape that a car would not get off). What you are more apt to see is the whole heading tied up and a dayman hunting for the fellow whose job it is to replace cars. This man, when found, perhaps waits for a mule to haul a jack, which, but for the division of labor necessary to "coöperation" might be carried.

Still following the extremist's idea of coöperation, the mine foreman goes into a room where there is some bad slate. "Hello, John, you've got some bad slate here. I'd have brought a prop with me, but I left it with Joe." Joe having filled his car, drops in to see how John is getting along. "L'mme set it while you finish your car from the other side. There's one right back here." "I'll hold it for you," says the mine boss.

The mourner after the old-time discipline, reporting a similar occurrence, will state that it would actually happen about like this: "Here, are you trying to commit suicide? Put a post there" (marking the place). John, without looking up, answers sullenly: "There ain't been no posts here for a week." Mine foreman: "There are a dozen only a step back; you better set one." John (still shoveling): "Too short." Mine foreman (measuring): "Here are several just right. Don't wait till that falls on you." A half hour later the driver reports an accident in John's room. The foreman hurries in and finds Joe "coöperating" in getting a ton of slate off John's neck.

As is usually the case the truth lies between the two extremes indicated. The discipline which is going to obtain in the future, as a result of the changes now taking place, probably lies somewhere between a military conciseness and the coöperation of brotherly love.

Mine managers of the old school will never again see the old-time discipline, and the advocate of a coöperation without any "punch" may have to wait a while. In the meanwhile "nerve," "ginger," "pep" and "punch" are as valuable as ever, and every man who welcomes "denatured" discipline because it coincides with his own temperament is apt to command an article which will go a long way toward further changing the standard.

The pessimist may feel that the decline is tending toward anarchy, but the chances are that mine discipline never was quite what we remember it as having been, and if there is a world movement in which authority and obedience breaks down, it will cover more than one lifetime. Perhaps it is better to conduct a "masterly retreat" than to stand against overwhelming odds, but as between the last stand of the old guard and the inglorious rout of those offering an easy victory to anarchy, the choice should not be difficult.

Sociological Department

Philadelphia & Reading Meet

SYNOPSIS—The "Reading" meet is a historical event, for the work of that corporation in first aid led all others in the United States. Drilling exercises are becoming popular.

The Philadelphia & Reading Coal and Iron Co. held its eleventh annual competitive drill at Lakeside Park, East Mahanoy Junction, near Tamaqua, Penn., on Saturday, Sept. 18. Emphasis may well be laid upon the ordinal adjective "eleventh," for no other mining company in the United States can lay claim to so long a period of first-aid activity as can the "Reading." The Pennsylvania Coal Co. and the Hillside Coal and Iron Co. are close competitors, but they did not hold their first meet till a year later. So the recent competition at Valley View of those two anthracite companies in the Luzerne field was only the tenth annual meet.

It is customary to say when attending an event of this kind that the work is better than ever every year. However, those who have followed the work of the teams at Lakeside Park realize that the Philadelphia and Reading miners early set such a fast pace that it is hard if not impossible to beat it.

Here of all meets is the best place to go if one would see model roller bandaging. This has been true for many years. This year some new developments have taken place, but they are not in the direction of new technique. The litter drill has been raised to an important feature, and setting-up exercises and military drills, while not performed under company direction, are being introduced with the approval of everyone.

The field used to be rectangular, but this year was made round, and the new shape had its advantages. In the center was a marquee, in which the records were kept, and a roped-off pathway led from this tent to the outer circle of the contest ground. In this way perfect order was maintained, which was the more necessary as the teams in the grounds were changed after every group of events.

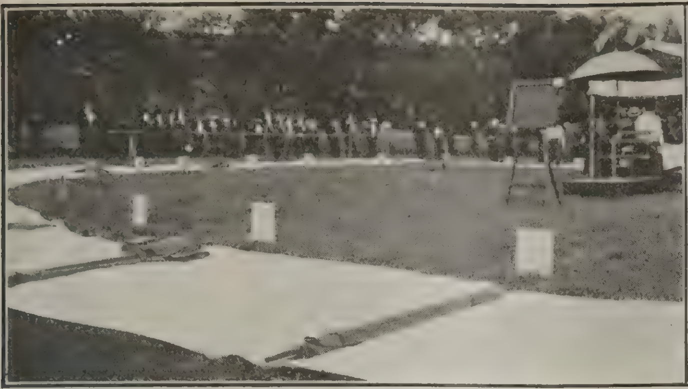
W. J. RICHARDS ADDRESSING THE WINNERS

E. T. Stotesbury, A director of the Reading

Oakley C. Curtis, Governor of Maine

R. J. Montgomery, sales agent of the Reading

SOME OF THE NOTABLES PRESENT



THE FIELD WAS METHODICALLY ARRANGED SO AS TO PROVIDE THE UTMOST DISPATCH

THE MEN OF EACH DIVISION PERFORMED THE SAME EVENT IN ELIMINATION TRIALS

In one event the victim was supposed to be burned on the head, face, chest, arm and hand—a terribly severe case, one would imagine. However, the men with one accord sat the patient up when bandaging him, as if there was nothing to dread from shock. This is mentioned particularly because there are many meets where the dressing, in such a posture, of a patient so frightfully burned would be penalized heavily.

The officials of the American Red Cross and the American Mine Safety Association urge that a man whose heart action has been weakened by such severe burns should be laid at full length, so that his heart will be subjected to less strain. Those who take a contrary view state that a victim, if at all conscious, is always anxious to sit up and will struggle to do so, and if he does his heart action will be even more seriously affected. Moreover, the bandages are more readily adjusted on a sitting man.

Fracture of the spine was treated by some of the teams without the care which is generally exercised in such work. One corps was even observed with the patient partly doubled up prior to splinting. Still it must not be thought that lack of care was in any sense frequent. In most cases the teams were as careful to do the work in the right way as to secure a perfect result for the judges to view.

The various districts each drew a problem from among ten presented. This problem was then submitted to all the corps in the district. In order to save time, three districts held their competitions simultaneously. The winning corps in each district then competed in the litter drill, which took place after dinner, the evolutions being: Form corps; procure litter; open litter; close litter; proceed to patient, double time; place patient on litter, examine for and dress one injury; transport patient to ambulance and place in the vehicle; return to place of formation; dismiss. Time allowance, 12 min. At the completion of this problem the corps executed such other movements with the litter as they saw fit, an additional time limit of 5 min. being accorded.

Addresses were made by W. J. Richards, president of the Philadelphia and Reading Coal and Iron Co., and by Governor Oakley C. Curtis of Maine. The blue ribbon and pennants were awarded to the Brookside colliery team by Mrs. E. T. Stotesbury. Pine Knot, which was second, was beribboned by Miss Richards, and Wadesville,

A DRESSING FOR A FRACTURE OF THE SKULL AND INJURY TO THE EYE

SOME OF THE TEAMS HAD AN EXTREMELY NATTY AND PLEASING APPEARANCE which was third, by Miss Smith. The other seven corps which led their districts were North Franklin, Suffolk Inside, Alaska, West Shenandoah, Mahanoy City Inside, Draper Outside and Bast City.

Exhibition Drills Introduced for First Time

After the speeches and presentations some setting-up exercises were performed and also some drills. The miners in the "lower region" work mostly in high coal, and of course being in hard coal do no undermining. They are therefore not disposed to stoop or carry themselves like bituminous miners who undercut coal in low seams.

There are few miners therefore who need setting up exercises and drill less than these Reading employees. Still drill is a good exercise for anyone and the practice of it will undoubtedly add to the excellent bearing of the Reading first-aid men. The public judges a man by his outward appearance and nothing will make it revise its present unfair estimate of miners so much as squads of men with a military bearing such as the Reading bids fair soon to have.

Rescue and First-Aid Work in Southwestern Illinois.

Special Correspondence

SYNOPSIS—First aid and mine rescue form the leading events at the Pinckneyville, Ill., fair. The one-man event is an open contest, many of the individuals taking part in it representing only themselves, as is customary in athletic sports.

The first mine-explosion demonstration and the first-aid contest ever held in connection with the mines of southwestern Illinois were staged Wednesday, Sept. 22, at the fair grounds in Pinckneyville, Perry County. It was one of the attractions of the Perry County Fair.

This arrangement was made possible through the efforts of Thomas Jeremiah, one of the directors of the fair association and also a member of the Illinois Mine-Rescue Station Commission. He is one of the operator representatives in that body. The medals given as prizes were provided jointly by the Illinois Mine-Rescue Station Commission and the Perry County Fair Association.

DEMONSTRATION OF A GAS EXPLOSION IN A MINE

An imitation mine gallery, with five rooms leading from it, was constructed of timber and tar paper, the whole structure being 45 ft. long, 18 ft. wide and about 7 ft. high. To form this representation of a mine 20 rolls of tar paper were nailed to thin wooden strips. Another illustration shows the entrance to the gallery and the team from the Benton, Ill., Rescue Station wearing the oxygen-breathing apparatus and entering the mine. The door seen at the left of the illustration leads into a testing room, which was filled at the time of the demonstration with a dense smoke, and in this atmosphere the oxygen apparatus was tested before the men entered the mine. As a dense yellow smoke poured out of the door when opened it was evident to the watching crowd that before a person could enter the room some form of breathing apparatus was necessary.

Before the main demonstration an exhibit was made of what was supposed to represented the old-fashioned way of handling an injured person. The victim was trundled along in a jolting wheelbarrow to his manifest discomfort. This demonstration supplied the comic element that the public nowadays seems to demand even in connection with the most serious situations.

The mine demonstration began with the entrance of the day shift into the mine, instructions being given by the manager to each man as he entered. Another realistic touch was an altercation between the men in regard to the work to be done and the method of doing it.

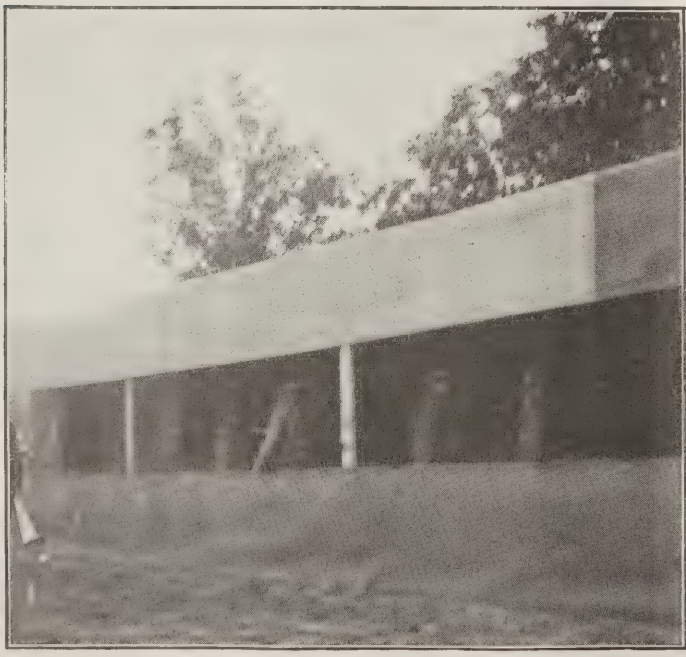
Soon after the party had entered an explosion was heard in the last room and word came to the manager still at the mine entrance that men had been injured by a gas explosion. He at once telephoned for assistance to the Illinois Mine-Rescue Station at Benton and in a few minutes an automobile dashed up bringing the Benton rescue team and supplies. An ambulance also soon followed.

The team quickly put on the oxygen apparatus and after testing it in the smoke room took its position along the life line and entered the mine, which by that time was filled with a dense smoke. Soon one supposedly injured man was brought out, followed closely by another, and both were placed in the ambulance and hurried to the hospital.

CONTESTS FOR TEAMS AND INDIVIDUALS

There were two parts to the first-aid contest—first, the team event, in which six teams competed, and then a one-man event, in which not more than two from each team were entered. In the latter individuals were also permitted to compete if not connected with any of the teams entering the former contest.

The problem given in the team contest was: Compound fracture of the left thigh; a wound 3 in. long in calf of right leg; a cut on the outer surface of the right forearm, with



AN IMITATION MINE FOR RESCUE DEMONSTRATION

MEN ENTERING THE MINE-RESCUE GALLERY

FULL-TEAM CONTEST

INDIVIDUAL EVENT

profuse bleeding. Treat and carry patient on an improvised stretcher a distance of 25 yd.

Ten minutes were allowed for the work. The competing teams were: Big Creek Coal Co., St. David; Wilson Richer mine, Pinckneyville; Mining Bureau of Inspection, Peoria; Producers Coal Co., West Frankfort; Majestic Coal Co. Du Quoin; Big Muddy Coal and Iron Co., Herrin, and Gillespie Independent First-Aid Association, Gillespie. The judges were Dr. G. F. Mead, of Pinckneyville; Dr. Byford Webb, of West Frankfort, and Dr. W. Daggert, of DuQuoin. The team from the Producers Coal Co., West Frankfort, won first place and the corps from DuQuoin and Herrin tied for second position. The problem given to break the tie was the treatment of a crushed pelvis. The Herrin team was awarded second prize and the DuQuoin team third.

In the one-man event there were so many contestants that it was necessary to take them in two divisions. All had the same problem, but, while the first division was contesting, the others were sent to a distant part of the grounds, so that they might not profit by observation of the methods of the first group. The problem given was:

Man has been struck by a fall of slate and his left ear has been torn off, a contused wound is found over his right eye, his scalp is lacerated and there is a wound 4 in. long on the right side of his head.

The time allowed for the event was 10 min. So close was the contest that three received the same mark for first place. To decide the event these three were given the problem: Thumb and index finger of right hand have been cut off, severe bright-red arterial bleeding resulting. Treat.

The winners of the event were: First, Burnett and Yuill, of Herrin; second, Nolte and Dunning, of DuQuoin, and third, Avoskee and Campbell, of Pinckneyville.

The local arrangements for the meet were made by James Torral, superintendent of the Benton Rescue Station, and Charles Swan, assistant in charge of the DuQuoin substation of the Illinois Mine-Rescue Service. The announcer of events was G. T. Powell, United States Bureau of Mines, Evansville, Ind., and the recorder was H. I. Smith, mining engineer, United States Bureau of Mines, Urbana, Ill.

The interest taken in the event by the miners, operators and citizens of Perry and adjoining counties showed gratifying appreciation of the first-aid movement.

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A Disorderly Workshop contributes to the number of accidents. Do not leave waste around which may catch fire, or leave material lying on the floor on which people may stumble. Safe places should be provided for the storage of all supplies.

COMING MEETINGS

Fourth Annual Mine Safety Demonstration of the Ellsworth Collieries Co. will be held Oct. 12 at Ellsworth, Penn.

National Safety Council will hold its fourth annual safety council at the Bellevue-Stratford Hotel, Philadelphia, Penn., Oct. 19-21, 1915. Secretary, W. H. Cameron, Chicago, Ill.

Engineers Society of Northeastern Pennsylvania will hold a special meeting at its rooms, 415 North Washington Ave., Scranton, Penn., on Thursday, Oct. 28, 1915, at 8 p.m. The object of the meeting is to take corporate action on the proposed issue of $15,000 4-per cent. 10-year bonds, for the purpose of refunding the outstanding floating indebtedness of the society and furnishing money for its general purposes. T. F. McKenna is the secretary.

First Annual State-Wide First-Aid Meet will be held at Bicknell, Ind., Oct. 30, 1915, under the auspices of the local unions of the United Mine Workers of America and the operators of Knox County, the Bureau of Mines and the American Mine Safety Association. William Bogle, Bicknell, Ind., is the secretary.

United Mine Workers of America will hold its annual convention in St. Louis, Mo., beginning Jan. 17 and continuing for three weeks. William Green, secretary-treasurer, 1102-1109 Merchants National Bank Bldg., Indianapolis, Ind.

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Next Week

The Oct. 9 issue of *Coal Age* will contain a number of safety and sociological articles that were crowded out of this special issue. We will also publish next week the first installment of a valuable article covering "Motor Haulage and Side Tracks in Coal Mines." No foreman, superintendent or manager can afford to miss this article. Other articles will deal with "Coal-Storage Plants," "Car-Supply Outlook," "Coal Mining by Longwall System," "Repairing Broken Tapes," "Accidents to Boilers at Coal Mines," "Trees in the Life of a Coal-Mining Community" and descriptions of the various first-aid meets held in the different coal districts.

Discussion by Readers

Explosibility of Coal Dust

Letter No. 1—I have been watching with great interest the discussions on the prevention of mine explosions and have wondered that some of the correspondents had not referred to the editorial published in *Coal Age,* Aug. 21, p. 303, entitled "Explosibility of Coal Dust." The editorial treats the question of why one coal dust is more easily ignitable than another. This is a most interesting inquiry, which is receiving the closest attention at the hands of some investigators who are trying to discover the probable cause of this difference in coal. Their method is to examine under the microscope thin slices of coal, in the hopes of finding important physical differences that would lead to a solution of the problem.

The editorial, however, deals wholly with the water content of the coal and refers suggestively to the report of David J. Price and Harold H. Brown, of the Millers' Committee of Buffalo. This report, which is entitled "The Explosibility of Grain Dust," seems to indicate that the corn dust, having the higher percentage of moisture, was ignited more readily than that with a lower percentage of moisture. That is to say, as the percentage of moisture increased, the temperature of ignition of the dust was lower. It is interesting to note that this corroborates the experiments of Prof. H. B. Dixon, which he performed some years ago when investigating the rate of explosions in gases. Professor Dixon at that time proved that 5 per cent. of moisture present, in the form of steam, in an explosive mixture of gas and air gave the highest velocity and the greatest pressure in explosions. Some correspondence had with Professor Dixon at that time, if my memory serves me, did not throw any additional light on this important matter.

Now, I believe that there is, in all probability, some difference between the effects produced by hydroscopic water when present in the coal and that produced by dampness or moisture accumulated on the face of the coal as the result of spraying, which is the common practice in many mines. I believe that most persons who have studied the matter will agree with the statement at the close of the editorial, to the effect that "though moisture probably is a protection, it is not an unquestionable guarantee of safety."

In this connection I was much interested in the article entitled "Scientific Humidification," by J. I. Lyle, *Coal Age,* Sept. 4, p. 378. In his summary at the close of the article, however, Mr. Lyle fails to state what weight of water vapor he considers should be present in the air to obtain the desired effect.

Considering this subject from a practical standpoint, there is no doubt but that the dust floating in the mine air may be greatly reduced with advantage by the use of sprays located at certain distances apart in the airways. Also, the method often adopted of spraying the cars of coal before they are hauled out of the mine should prove efficacious in reducing the accumulation of dust on the haulage roads and its suspension in the air current traveling in the mine. It is generally admitted that the humidification of mine air to the point of saturation is not desirable in the mine, as such a degree of saturation is not conducive to the health of the mine workers.

Taking all these facts into consideration, one is led to conclude that the humidification of the mine ventilating current does not increase the safety of the mine, except as it prevents the absorption of moisture to that extent from the mine workings, rendering them dry and dusty. On the other hand, the hydroscopic water in the coal assists its disintegration, and it may be reasonably inferred that coals low in hydroscopic moisture will not be as readily held in suspension as dust in the air current, and the mining of such coal might therefore be accomplished under safer and more sanitary conditions.

JAMES ASHWORTH,
Mining Engineer.

Vancouver, B. C., Canada.

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Preventing Mine Explosions

Letter No. 9—As the winter season again approaches, the question of the best means of preventing mine explosions becomes of increasing importance. On this account I want to draw attention to the method adopted by the Powhatan Coal and Coke Co., at Powhatan, W. Va. It would seem from the results obtained that the form of humidifier installed at this mine has solved the dust question and made it possible to keep the mine in a safe condition at all times, as far as the dust is concerned.

When once understood, the method is exceedingly simple. By means of a radiator consisting of a system of steam pipes placed on the intake air current the air is heated to a temperature higher than the temperature of the natural strata in the workings. In the use of this apparatus steam is injected into the air after the latter is heated by passing over the pipes. The heated air is able to carry a larger amount of moisture than would otherwise be possible, and while in this condition absorbs the steam as it issues from the ends of the pipes. No more steam is permitted to escape from the pipes than the air current will absorb. This is important in order to avoid the formation of fog in the entry beyond.

As the warm moist air comes in contact with the cooler walls of the mine a portion of its moisture is condensed, and the air flows through the workings in a saturated condition, which prevents the further absorption of moisture from the mine workings and the drying out of the mine. It is well known that an air current of 100,000 cu.ft. per min., when fully saturated at a temperature of 0 deg. F., will carry slightly less than a gallon of water as absorbed moisture, and each rise of 20 deg. approximately doubles the carrying capacity of the air. [At an average mine temperature of 62 deg. F. the capacity of air for carrying moisture is 12 gal. per 100,000 cu.ft. per minute.]

Inasmuch as most coals contain less than 15 per cent. of moisture—and, I believe, it has been shown that an explosion due to the ignition of dust floating in mine air is possible when less than when 30 per cent. of moisture is present—it would seem that every practicable means should be employed for maintaining a high percentage of moisture in mines in order to reduce the possibility of an explosion from this cause to the lowest possible limit. In the humidification of the intake current passing into a mine it is evident that this must be effected at a temperature, as I have mentioned, higher than that of the natural strata in the mine.

The humidifier that I am about to describe has been installed and is in successful use not only in the mines of the Powhatan Coal and Coke Co., at Powhatan, but also in those of the Lynchburg Coal and Coke Co., at Kyle, and the Eureka Coal and Coke Co., at Eckman—all in this state. It is not claimed that this arrangement is new, having been installed in these mines for a number of years. At the time of installation the tests made by Walter Proctor, a mechanical engineer of Norfolk, showed satisfactory results in respect to maintaining a high percentage of humidity in the mine. More recently I have made tests that confirm these results as well as the monthly reports sent to my office by the company during the last two years.

The humidifier consists essentially of a series of 3-in. pipe lines arranged 20 in. center to center in the intake airway. The pipes are connected at the outby end with a steam main by means of cross-pipes, elbows and tees. There are over 40 of these pipes in the humidifier, which is 70 ft. in length, making a total of 3,000 lin.ft. of 3-in. pipe. They occupy the entire cross-section of the airway. The inby end of each pipe is fitted with a small nozzle spray, which distributes the steam as it issues from the pipe into the air. The water resulting from the condensation of the steam is conducted by a concrete drain to a sump prepared to receive it. Also, the condensation in the pipe line drains to a trap, from which it flows into the sump, which is drained by a small pump located in the intake airway outby from the humidifier.

Briefly described, my test at the Powhatan mine, Jan. 20, 1915, gave the following results: 8:25 a.m., intake airway, 103,000 cu.ft. per min.; relative humidity, 82 per cent.; 8:56 a.m., main entry, last breakthrough, 18,200 cu.ft. per min.; relative humidity, 95 per cent.; distance traveled by the air, 7,560 ft.; width of entry, 8½ ft.; 9:45 a.m., room 41, last breakthrough, 16,900 cu.ft. per min.; relative humidity, 95 per cent.; distance of this room from radiator, 6,000 ft.

Out of 28 similar tests made in this mine, four tests showed a relative humidity of 100 per cent.; one test, 97 per cent.; fifteen tests, 96 per cent.; six tests, 93 per cent.; and two tests, 89 per cent. The average relative humidity in these tests was 95.5 per cent. These figures speak for themselves as to the effectiveness of the humidifier installed at this mine, since the outside atmosphere at the time of making the test showed a relative humidity of only 41 per cent. The humidity on the return airway of this mine at times reached 100 per cent.

In closing, permit me to draw attention again to the basic principle that must be considered in the design of any successful humidifier for mine use. The failure of so many forms of apparatus installed for this purpose is due to the fact that they do not take this principle into account. I refer to the relative carrying capacity of the air current at different temperatures. It must be remembered that when the outside temperature is low, as in winter, the air entering the mine may be fully saturated, but as the temperature rises, owing to the heat of the mine, its capacity to absorb moisture is rapidly increased, being practically doubled for each 20 deg. of rise in temperature, and as a result the air passing through the mine is quite dry, although carrying the same weight of moisture in the air current. I think a full discussion of this subject is important at this time and believe that a general law governing the essential points, which I have stated, would be effective in reducing the number of dust explosions in mines.

LAWSON BLENKINSOPP,
Mine Inspector, 13th District.

Landgraff, W. Va.

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Egyptian State Ry. Specifications

Referring to the editorial on the Egyptian State Ry.'s contract, *Coal Age,* Aug. 28, p. 344, permit me to offer the following comments:

As to the strike clause, cancellation can be made only after actual suspension of shipments. It requires the delivery of the entire tonnage, but allows an extension of time for deliveries.

Purchases in the open market on account of failure to deliver are not left to the "judgment of the buyer" but are only allowed under failure to deliver as per contract.

You say that the ash specification is not so exacting as the volatile requirement. Now, the latter is about 35 per cent. and not more than 40 per cent. of volatile combustible matter, while the ash requirement is about 6 per cent., both being on dry coal. I submit that 6 per cent. ash is a much more exacting requirement than the 35 to 40 per cent. volatile, even though 2 per cent. more is allowed before penalty begins.

Your criticism of the loading dispatch is not quite warranted, in my opinion. The contract says that the time allowed for loading commences from the time the vessels are ready to load. Even at Hampton Roads ships are sometimes ready to load days before loading actually begins, this being due to congestion of ships and delays to the coal at the piers. There is sometimes a shortage of coal, which delays loading even after it has been started.

The record time of loading at Hampton Roads, which you give, began when the ship had tied up at the pier, with hatches open; she might have been ready to load and out in the stream for two or three days. It is true of course that we can load ships faster than they can abroad, but their fastest loading is fairly good, being 4,000 tons in 3 hr. 40 min., 2,652 tons in 2 hr., 2,100 tons in 1 hr. 57 min.

You say that "with freights at $11 to $12 to Mediterranean ports the deposit required is excessive." Freights are not at any such figure now and have not been for some time. The present rates are about $9.28. The deposits required may seem excessive to us, but Egypt is a long way from the source of supply and the costs are high. The successful bidder on the Panama R.R. contract must put up a bond of not over $30,000.

Under the contract provisions you state: "It seems unlikely that American shippers will be enthusiastic about this particular business in Egypt." Inasmuch as there were 159 bidders on this contract, many of them United States shippers, it would seem that while possibly not enthusiastic, the American shippers were quite willing.

And finally you advance the opinion: "In future years . . . it may be that conditions will be modified and that American shippers will be successful competitors for such contracts." You do not seem to be aware that United States shippers have had a share of this particular contract for the last three years and have been awarded 60,000 tons of the business for this year, 90,000 tons going to Monmouthshire coals, the balance (of 360,000) not awarded as yet.

F. R. Wadleigh.

Philadelphia, Penn.

Longwall vs. Room-and-Pillar Mining

Letter No. 4—In his letter No. 3, *Coal Age*, Sept. 11, p. 432, R. J. Brown cites a particular case of longwall mining adopted in a Northumberland mine, and adds, "The method proved an absolute failure." He should have given the particulars in regard to this mine so that we could judge correctly the cause of the failure. It is just these particulars that we all want to know whenever it is possible to obtain them.

Mr. Brown must bear in mind that there are more methods than one in longwall mining, and the cause of failure may have been the use of a method that was not adapted to the conditions existing in the seam. Perhaps when it was discovered that it was not a success, the operators hesitated to change their plan, fearing a like result would reward their efforts. I do not wish to reflect on the competency of the mine officials in that case, but only to emphasize the fact that the adoption of another method might have been rewarded with success.

To illustrate this point, permit me to cite an instance in my own experience. It occurred in a mine in West Yorkshire, England. An attempt was made, first, to work the mine on a longwall board-face, but it was found when the working faces were developed that the roof could not be supported by props, even by using cap-pieces a foot wide on top of the props. The operators were not discouraged, however, and at once adopted the plan of using split posts, which the men were required to set 4 ft. apart along the entire face of the coal. They soon found that this plan required too much deadwork. In their own words, the company was paying too much "consideration money" for the moving of dirt. The slate and shale roof would fall right up to the face, between the timbers. This was not only a menace to the workmen but produced much dirty coal.

After studying the matter, another plan was tried, which proved successful. A change was made from the "board-face" to the "end-on" method of driving. In other words, the longwall face was advanced on the ends or butts of the coal. This gave a greater support to the frail roof, although the miner was obliged to shear the coal at each roadway and mine or break it across the face until he reached the boundary of his working place. To explain more fully, this change from the "board-face" plan to the "end-on" method was necessitated because the first foot of the roof shale or slate was too friable to be supported when the coal was worked on the face.

I freely allow that the longwall method of mining cannot be applied under all conditions; but, under conditions favorable to its use, I maintain it is a superior method of mining than that of the room-and-pillar system. It does not appear to me that Mr. Brown will dispute this claim that the longwall method of mining, under favorable conditions, will give a lower cost of production and a more uniform output of coal, provided it is well managed by competent men.

We frequently see it stated that the longwall method has proved a failure in most American mines. It is more than probable that these failures have been caused by lack of judgment on the part of the officials in charge. There is one thing we must consider, and that is that many of these seams, owing to their thickness, require the building of good, substantial packwalls, for which suitable material must be selected. If this work is not well done, the result is a failure. The building of the packs is of far greater importance in the working of a seam 5 or 6 ft. thick on the longwall plan than when adopting the same method for the working of a 13- to 18-in. seam of coal.

In closing, I would ask in reference to the list of explosions given by Mr. Brown as having occurred in longwall mines, Are these as numerous as the explosions that occur in room-and-pillar mines? Explosions, in the latter case, occur with great frequency in newly opened mines, while the explosions in longwall mines have been largely due to the habit of gobbing the inferior coal in those districts. One could hardly expect that a mine that has been worked 50 years under such a practice could be immune from explosion. Another cause of trouble is the fact that the timbers are often left in the waste. These should all be taken out in longwall work, so that the roof can settle uniformly on the waste.

John Oldroyd.

Fairmont, W. Va.

Prohibition and Welfare Work

Letter No. 4—I do not want to be understood as criticizing F. S. Johnson's good letter No. 3, *Coal Age*, Aug. 28, p. 350, but would like to give my own views concerning one remark he makes, which is as follows: "At times I have been inclined to thing that there is a certain amount of coddling indulgence permitted in our welfare work among the foreign-speaking miners."

The foreign-speaking miners form a large majority of the mine workers in the West Virginia coalfields. In my experience they do not want to be "coddled" any more than does the American miner, although I may say that we can all stand a certain amount of coddling at times. But when judging the foreign-speaking miner we must consider his circumstances. We must remember that this class of mine workers comes largely from countries where strong drink is to be found in almost every public place, and was sold, before the war, with scarcely any restriction. Indeed, in those countries strong drink is the leading feature wherever people are gathered for a good time, and these foreigners coming to our shorees naturally follow their long-formed habits and inclinations. They enjoy themselves most when there is plenty of booze at hand.

We recognize this as a bad habit and one that is opposed to the best training and efficiency of the worker; but as has been stated previously, "If you would put an end to a habit of any kind in men, women or children you must give them something in place of it." Few have the power to break away from a bad habit without something is afforded to divert their thoughts into a different channel.

Mr. Johnson has referred to the different diversions furnished by the Y. M. C. A. in their work in many mining towns. These consist chiefly of reading-rooms and classes, with the added attraction of bowling, billiards, ball and tennis grounds, swimming pools, etc. We must admit that these are not so numerous at the present time, although I agree we are headed in the right direction regarding them. Now, we must not forget that most of these diversions are purely American sports and games, and naturally do not appeal to the foreigner. Again, we are too prone to regard foreigners as a class by themselves, and are not giving them an even chance to learn and become interested in our games. In our contact with these people we should forget nationality and encourage them to join with us in the enjoyment of the attractions and diversions offered. Are we doing this?

While speaking of the Y. M. C. A. diversions, first-aid teams, prize gardens and other uplifting agencies, I am reminded forcibly of the reference made to the power of music, in "Extracts from a Superintendent's Diary," *Coal Age*, Aug. 28, p. 337. This superintendent tells us of the universal appeal that music possesses, its all-pervading power and charm and the deep motion it is able to arouse in the human breast. That short article is worth the reading to anyone. In describing the effect of a song, he states: "Old grudges seemed to be forgotten, neighborhood quarrels seemed to have lost their meaning and distinctions of birth and salary meant nothing at all to the crowd while under the spell of the music." The crowd to which he refers was composed of the men, women and children of the camp, and the singing was that of a young lady visitor possessed of a "magnificent voice."

In closing, permit me to mention another reference made by George N. Lantz, Aug. 21, p. 309, who suggests: "Every community should have its local band or officer, while choral clubs and good quartettes always provide a source of profitable entertainment." In my own experience good musicians are plentiful in all mining camps, and these can be organized at little expense to give free concerts and provide good singing in places where the miners could bring their families for an evening's enjoyment. The Welsh and Germans long ago realized the value and power of music in their mining towns, and if we gave this matter the attention it deserves we would be surprised at the amount of such talent existing in our mining towns and ready at all times when asked to give their best efforts for the common good.

C. J. FUETTER.

Logan, W. Va.

Study Course in Coal Mining

By J. T. BEARD

The Coal Age Pocket Book

The Circumference—The circumference of a circle is divided arbitrarily into 360 deg., which probably originated as corresponding closely to the number of days in a year, or the ratio of the number of revolutions of the earth on its axis to a single cycle in its orbit. The number 360 is also a convenient number for subdivision.

The Quadrant—The quadrant is a fourth of a circle. Two diameters perpendicular to each other divide the circle into four quadrants, each containing a right angle and subtending an arc of 90 deg. in the circumference of the circle.

Radius, Chord and Tangent—A **chord** of a circle is perpendicular to the radius passing through its middle point.

A **tangent** is perpendicular to the radius at its point of tangency to the circle.

The **chord of an arc** of a circle is a mean proportional between the diameter of the circle and the rise of twice that arc.

The **half-chord** of a circle divides the diameter to which it is perpendicular into two parts or segments and is a mean proportional between them.

To Find the Center of a Circle—Draw two chords making a suitable angle with each other. Bisect each of these chords with a perpendicular. The center of the circle is determined by the intersection of the two perpendiculars.

Inscribed Angles—An angle is inscribed in a circle when its apex lies in the circumference and the lines forming the angle are chords, or one of the lines may be the diameter of the circle. Thus, in Fig. 2, on the preceding page, the angle ABC is inscribed in the circle whose center is O. Likewise, in Fig. 1, the angle BAC is an inscribed angle; also, the angle ABC and ACB.

An angle inscribed in a circle is measured by one-half of the subtending arc, and is therefore equal to one-half of the corresponding central angle, which is measured by the same arc. Thus, in Fig. 2, the inscribed angle ABC is exactly one-half of the central angle AOC, each being subtended by the same arc AC.

Any angle inscribed in a semicircle, as the angle ABC in Fig. 1, is a right angle, being measured by one-half of the semicircumference ADC or ½ of 180 deg. = 90 deg.

Inscribed Polygons—A polygon is inscribed in a circle when all of its angles are inscribed angles and its sides are chords of the circle. Since the perimeter of a regular polygon of a given number of sides is proportional to the radius of its circumscribing circle, and its area to the square of that radius, the side and area of regular polygons can be expressed as multiples of the circumscribing radius and its square respectively as given below:

No. of Sides	Subtending Angle	Length of Side	Area of Polygon
3	120°	1.732 R	1.299 R^2
4	90°	1.414 R	2.000 R^2
5	72°	1.176 R	2..378 R^2
6	60°	1.000 R	2.598 R^2
8	45°	0.765 R	2.828 R^2
10	36°	0.618 R	2.939 R^2
12	30°	0.518 R	3.000 R^2

The Coal Age Pocket Book

PRACTICAL PROBLEMS

Given the Chord and Rise of a Circular Arc—

1. To find the Radius: Divide the square of half the chord by the rise, and to the quotient add the rise and divide the sum by two; or, expressed as a formula,

Radius of arc, $$r = \tfrac{1}{2}\left(\frac{c^2}{4\,h} + h\right) \qquad (1)$$

2. To Fnd the Length of the Arc: The best method is to apply the principle of subchords, by first finding the rise of the arc for each successive subchord, in turn, using the formula,

Rise of subchord, $$h_1 = r\,(1 - \sqrt{1 - h/2\,r}) \qquad (2)$$

until a rise is found (h_n) that gives practically the same value as before for the total length of arc as calculated by the formula

Length of arc, $$l = 2\,n\,\sqrt{h_n\,(2\,r - h_n)} \qquad (3)$$

3. To Find the Area of the Sector Subtended by the Arc: Multiply the length of the arc by one-half the radius; thus,

Area of sector, $$A = \frac{l\,r}{2} \qquad (4)$$

4. To Find the Area of the Segment: From the area of the sector subtract the area of the triangle formed by the chord and the two radii drawn to its extremities, as expressed by the formula

Area of segment, $$A = \tfrac{1}{2}\,[l\,r - c\,(r - h)] \qquad (5)$$

Given the Chord and Radius of a Circular Arc—

1. To Find the Rise:Subtract the square of the half-chord from the square of the radius; extract the square root of the remainder and take the root thus found from the radius; or, expressed as a formula,

Rise of arc, $$h = r - \sqrt{r^2 - (c/2)^2} \qquad (6)$$

2. To Find the Length of the Arc: First find the rise of the arc by means of Formula 6; then follow the method described above, applying Formulas 2 and 3.

3. The areas of the sector and segment are then found as previously explained.

Given the Rise and Radius of a Circular Arc—

1. To Find the Chord: Subtract the rise of the arc from twice its radius; multiply the remainder by the rise; extract the square root of the quotient and multiply by 2, as expressed by the formula

Chord of arc, $$c = 2\,\sqrt{h\,(2\,r - h)} \qquad (7)$$

2. To Find the Length of the Arc: Apply Formulas 2 and 3, as previously explained.

3. The areas of the sector and segment are found as before.

Note—The above formulas, 1-7, give the closest approximation possible in the solution of circular arcs, sectors and segments, without the use of trigonometric functions.

Inquiries of General Interest

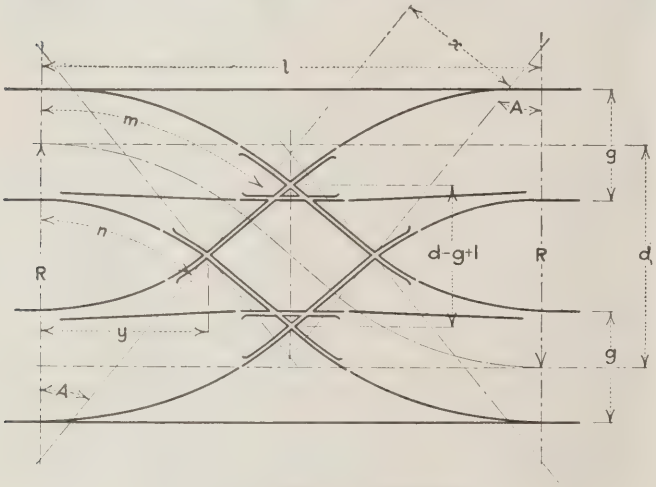
Calculating Diamond Crossover for Shaft Bottom

We want to put in a diamond crossover at the bottom of our shaft, and I would like to ask if it is possible to put in such a crossover with four frogs. There are two parallel tracks, each having a gage of 42 in., and the distance between the inner rails of these tracks is also 42 in. I would very much appreciate a sketch showing how this can be done and the position of the frogs and giving the other dimensions necessary to lay out the crossover.

ALVIS P. MERCER.

Martwick, Ky.

The only dimensions given in this case are the gage of the track ($g = 3.5$ ft.) and the distance between track centers, which is twice the gage, or $d = 2 \times 3.5 = 7$ ft. In order that such a crossover can be operated successfully, it is necessary that the two frogs on the straight rails of the two tracks shall be constructed, as shown in the accompanying figure, with a small triangle of solid iron in the center of the frog. The purpose of this is to sufficiently separate the three points where the gage lines of the three rails cross each other. It will be sufficient if the gage lines of the two switch rails cross each other 6 in. inside of the gage line of the straight rail. This will make the distance measured straight across the rails, between the two points where the gage lines of the switch rails cross each other, $d - g + 1$, as indicated in the figure. All the dimensions in the following calculation are made to gage lines.



A DIAMOND CROSSOVER

The first step in the solution is to find the angle A, which subtends the curved rail of each of these switches. This angle is found by substituting the values for d and g in the formula

$$Cos\ A = \frac{g}{d - g + 1} \times \frac{3.5}{7 - 3.5 + 1} = \frac{3.5}{4.5} = 0.7778+$$

Hence, $A = 38°\ 57'$.

The second step in the solution is to assume a convenient radius, say in this case $R = 10$ ft., and calculate therefrom the entire length of the crossover, from point of switch to point of switch, which is marked l in the figure. This distance is found by applying the principles of trigonometry, which gives the formula

$$l = 2\ R\ sin\ A + \frac{d - 2\ R\ (1 - cos\ A)}{tan\ A}$$

Then, substituting the known values in this formula, gives for the total length of the crossover

$$l = 2 \times 10 \times 0.6286 + \frac{7 - 2 \times 10\ (1 - 0.7778)}{0.8083}$$

$$= 15.73\ ft.$$

Since the angle of curvature of each of the switch rails is 38° 57′ and the radius of the outer rail in each switch is $r_1 = R + \frac{1}{2}g = 10 + \frac{1}{2}(3.5) = 11.75$ ft., the length of the outer curved rail, indicated by m in the figure, is

$$m = \frac{38°\ 57'}{180°}\pi r_1 = \frac{38.95}{180}(3.1416 \times 11.75) = say\ 8\ ft.$$

The radius of the inner curved rail is $r_2 = 10 - \frac{1}{2}(3.5) = 8.25$ ft., and the length of this inner rail, indicated by n in the figure, is therefore

$$n = \frac{38.95}{180}(3.1416 \times 8.25) = 5.6\ ft.$$

The length of straight rail in the switches, indicated by x in the figure, is found by substituting the known values in the formula

$$x = \frac{l - 2\ R\ sin\ A}{cos\ A} = \frac{15.73 - 2 \times 10 \times 0.6286}{0.7778}$$

$$= 4.06\ ft.$$

The two frogs in the loaded and empty tracks respectively are located midway between the switches, or at a distance of $\frac{1}{2}l$ from either switch. It now remains to calculate the distance of the two frog-points lying between the tracks, or the distance marked y in the figure. This distance is measured on the line midway between and parallel to the two tracks, from the line joining the switches to the point of frog. This distance is calculated by substituting the known values in the formula

$$y = \sqrt{r_2\ (d - g) - \tfrac{1}{4}\ (d - g)^2}$$

Since the radius of the inner curved rail (r_2) is 8.25 ft., the frog distance at each end of the switch is

$$y = \sqrt{8.25\ (7 - 3.5) - \tfrac{1}{4}\ (7 - 3.5)^2} = 5.08\ ft.$$

It is possible to lengthen out this crossover by adopting a longer radius than $R = 10$ ft. The angle of curvature (A), however, remains constant, for the same values of distance between track centers (d) and track gage (g), as appears from the formula given for finding this angle. For example, for a radius $R = 15$, the length of this crossover would be $l = 19.27$ ft. It is also possible to have the crossover rails cross each other outside of the track rails instead of arranging to have them cross within these rails, as in the foregoing figure.

Examination Questions

Tennessee Examination for Mine Foremen, Etc.

(Continued from Last Issue)

Ques.—A certain entry generates more or less marsh gas in many of its working places, sometimes in considerable quantities. This entry is worked with naked lights and kept reasonably clear of gas by means of a good ventilating current, which is carried well into the faces by frequent breakthroughs and the use of line brattices where necessary. A foreman, while making his rounds during the day and starting up this entry, finds the main door standing open and all the air short-circuited from the entry. He does not know how long the door has been open or what the conditions are at the face, except that a small number of men are working that day in this entry. Explain what he should do under these circumstances, giving reasons. How would you criticize the management of this mine?

Ans.—Since the foreman does not know how long the door has been standing open, or the quantity of gas that may have accumulated in the workings in the meantime, it would be dangerous for him to close the door and thus reëstablish the current in the entry. This would at once drive any gas that may have accumulated in certain places onto the open lights of the miners at work. It may be assumed that the miners have not experienced any serious trouble as yet owing to the door being opened. The foreman should therefore proceed with caution up the entry, leaving the door standing open. He should carry a safety lamp or, not having this, he should extinguish his own light and proceed in darkness. (All mine officials should carry a small flashlight for such emergencies as this.) If possible, he should leave someone to guard the entrance until his return. Having reached the men at work, the only safe method to adopt would be to order all lamps extinguished and withdraw the men from the entry temporarily until the place can be examined for gas in the usual manner with a safety lamp and pronounced safe for work. After the men have been withdrawn from the entry and before the door is closed, all the men working on the return of that current should be notified and likewise withdrawn. The door should then be closed and every entrance to that section of the mine and the return airway carefully guarded.

The setting open of a door in a mine does not necessarily call for the criticism of the management, further than to say that all doors should be so hung that they will close automatically unless they are propped or held open. If the door was propped open so that it could not close, this would call for an investigation that would place the responsibility on the guilty party.

Ques.—A miner on going back to a hole that he supposed had failed is injured by the explosion. He is badly burned on the face and arms and has his right leg broken above the knee. The doctor is out of the camp and it is impossible to obtain medical assistance for several hours. You have a first-aid outfit at the mine as required by the mining law. Describe in detail what you would do for this man while waiting for the doctor.

Ans.—As quickly as possible bring a stretcher and first-aid outfit, including splints and bandages, to the place. In the meantime, avoiding any unnecessary movement, place the injured man in as comfortable a position as you can. Having put him on the stretcher and carried him to the nearest convenient place where there is good air, proceed to bind a long splint reaching from the foot to the armpit on the outside of the injured leg, together with a shorter splint reaching from the foot to the crotch on the inside of the leg. The binding strips should encircle the chest as well as the limb, in order to prevent unnecessary movements of the fractured bone.

Apply a thin paste made with water and baking soda, starch or flour to the burned surfaces. Vaseline, olive or castor oil, fresh lard or cream may be used to keep the air from contact with the burn. Cover the burned parts with a light bandage to exclude air and dust.

Ques.—In a small drift mine in which one of the openings for air is the drift, while the other is a shaft through the hill and connected with the air course, the top of the shaft is about 100 ft. above the level of the seam. (a) Relying on natural ventilation, tell how and why the air will circulate. (b) Will there be any difference in the direction of the air current at different times of the year, and if so, in what direction will the air travel in the winter and in the summer seasons respectively?

Ans.—In a drift mine the seam may be assumed to be practically level. The air in the mine airways is supporting two air columns of equal height, but of unequal temperature, during the greater portion of the year, in that portion of these columns corresponding to the depth of the shaft. The two air columns have equal temperatures above the level of the top of the shaft, and it is unnecessary to consider them above that level, as their pressures balance each other.

(a) The air column in the shaft, however, does not always balance the corresponding 100 ft. of atmospheric column at the drift mouth, because of the shaft temperature being generally higher or lower than that of the outside air and the weight of the shaft column therefore being usually less or greater than that of the outside air column. As a consequence the air in the mine airways moves from the point of higher pressure to that of lower pressure.

(b) Yes. In the winter season the outside temperature being lower than that of the mine, the outside air column 100 ft. high is heavier than the shaft column, and this excess in weight causes the unit of ventilating pressure that forces the air to move from the drift mouth toward and up the shaft. In the summer the reverse is true—the mine temperature being then lower than that of the outside air, the shaft column is the heavier of the two columns, and the air moves down the shaft and out the drift mouth.

Book Reviews

Resuscitation, Manual and Mechanical

REPORT OF THE COMMITTEE ON RESUSCITATION FROM MINE GASES—By W. B. Cannon, George W. Crile, Joseph Erlanger, Yandell Henderson and S. T. Meltzer. United States Bureau of Mines, Technical Paper 77. Paper cover; 5⅞x9⅛ in.; 33 pp.; 4 ill. Free on application.

Some time ago "Coal Age" urged the Bureau of Mines to have its researches into subjects indirectly related to mining made by specialists as competent as those engaged to investigate mining problems and said that engineers ought not be chosen when sociological appointments had to be filled. Whether the Bureau took the advice thus proffered or not cannot easily be determined, but in any event when it decided to investigate resuscitation it chose out a formidable body of recognized experts to make the inquiries and a report. Yet "Coal Age" cannot consider itself impressed by the result.

In fact, the bureau itself, while publishing the monograph in full, added a preface in which it somewhat openly ignored the resuscitation device recommended by one of the committee and urged the Schaefer system of artificial breathing, just as if the Meltzer apparatus were, for some reason, impracticable. It must be confessed that this report, while at times quite interesting, is on the whole of doubtful value and does not appear quite fair.

MERIT OF OCCASIONAL RIB BREAKING

One of the principal recommendations does, it is true, meet with almost universal approval. The authors of the report advocate the use of the Schaefer instead of the Silvester treatment, and the public is by this time fully in accord with that judgment. But one reason given for that verdict is ridiculous. One of the advantages claimed in the report for the prone pressure method over the Silvester is that there is little danger of injuring the liver or breaking the ribs if pressure be gradually, not roughly, applied. Whoever suggested that the Silvester method had that defect? Why, then, claim the Schaefer is superior because with care it may not have it?

The Schaefer treatment has been credited with that defect many times, but here the fault is urged as a surpassing merit. Dr. Lauffler has declared that the system of resuscitation could only injure a patient whose bones were severely tuberculosed. Let us not be misunderstood. Probably the Schaefer method is as harmless as the experts assert, but to suggest that it is to be preferred to the Silvester method because, with proper care, it will not do what the Silvester method never can do is a queer process of reasoning. Such an argument is akin to that of declaring that a felon is better than an honest man because, while the honest man never committed a crime, the felon only did it when severely tempted. But perhaps it is not well to find fault with those who agree with us on the main issues, even when the reasons for their agreement are a cause of much regret.

One good reason for preferring the Schaefer method is given in our issue of Aug. 30, 1913, in an editorial on "The Schaefer Method." This argument in behalf of prone pressure has been too generally overlooked. The Silvester method employs parts of the body which are more likely to be burned or broken in an accident and therefore, to use a medical phrase, "is seldom indicated." The Schaefer method involves parts which the first-aid man usually finds entirely uninjured. It is therefore usually to be preferred.

WHEN FIDO HAS A FAINT DON'T GET A PULMOTOR

The part of the report which has caused no little excitement is that relating to the pulmotor, and it is probably proved that this insufflating device is ill-fitted for the resuscitation of chloroformed pussycats and anaesthetized and curarized lap dogs. A better system of supplying these animals with air in apnoea appears to have been devised long ago. It is to be hoped that all mine managers will remember this when Fido has a faint and will refrain from sending for a pulmotor.

It is interesting to note that, according to the report, the pulmotor more or less proves inadequate when used on animals. But Dr. Meltzer has found that another insufflation apparatus which had proved successful on dogs, cats, rabbits and monkeys failed to work on men, doubtless, however, not for the same reason as makes the pulmotor less valuable for small animals than for human beings. But that modifications are needed in the one case makes it only fair to admit that they may be required in the other.

Dr. Meltzer and his associates will doubtless assent to this, but as they do not make it plain it is well to assert it. Everyone knows that experimentation on one mammal is not a sure guide to the way in which another mammal will react to like treatment. It is frequently indicative, of course, and valuable, but it is by no means conclusive.

The committee seems to show unjustifiable bias in dealing with the pulmotor. The layman will hardly sympathize with the feeling of the profession so clearly manifested in the statement, "The pulmotor has received wide publicity in the daily press," and again, "Its loudest sponsors are the newspapers." The medical man has trained himself to feel as if by instinct that what the public praises is by that sign anathema. The reason for the doctors failing to praise the pulmotor, though many have approved it, is the same which restrains the technical press in general. The pulmotor is a proprietary article, and therefore anything written in its favor sounds like an advertisement. Moreover the doctors do not like to praise what doctors do not invent or introduce.

The report attempts to show that neither in Germany nor in the United States has the pulmotor been given much attention by the medical press and profession. It quotes several cases in which the pulmotor has been said to do good work, and then inquires either whether the persons really needed any help or not and whether some other means might not have done as well. To show how grossly unfair the insinuations are, one will be quoted.

IS THERE ANY CONCEIVABLE WAY BY WHICH A SKEPTIC CAN BE CONVINCED?

"Dr. Rossiter, company surgeon, Swissvale, Penn., reports a case of 'gassing' Dec. 28, 1912: The patient was unconscious, had no pulse, no signs of respiration, very feeble heart and loss of all reflexes. Before I arrived the hospital attendant performed artificial respiration in connection with the inhaling device of the pulmotor. I continued this treatment after my arrival for about one-half hour, at the end of which time there was very little change in the patient. I then switched over the pulmotor and adjusted it without pulling out the tongue or pressing on the larynx. In the course of a few minutes the patient started to fight and wanted to sit up."

The patient had been given manual artificial respiration by a hospital attendant, the doctor had continued the treatment for a half hour, and in addition he had permitted the patient to inhale oxygen and all the work done had just enabled the patient to keep life in his body. What does the committee say?

"In this case manual artificial respiration combined with oxygen continued the respiratory function for much longer than the critical period and the pulmotor was not necessary."

If then the victim of an explosion in your mine can be kept hovering between life and death by the expert use of manual movements and inhalation of oxygen, do not use a pulmotor—for he might get up and walk, and some foolish man in your employ might credit the pulmotor with doing the work. But the argument is so weak "Coal Age" may be excused if it quotes another gem—this time about some Bureau of Mines' cases:

"In the eighth case (Burgess) the pulmotor was first applied 30 min. after the victim had been removed from the gas atmosphere. No statement is made as to what was done for him in the interim. In the ninth case (Enzian) Dr. McGuire, of Wilkes-Barre, 'endeavored for two hours to revive her by artificial respiration. Failing in this a pulmotor was brought a distance of 8 miles. Under the manipulation of G. T. Holdaman the patient was revived in two or three hours.' Cases 8 and 9, in which the victims lived a long time before the application of the pulmotor (half an hour and two hours), do not present convincing evidence."

According to this method of proof a remedy which appeared to break up a chronic disease would be subject to more doubt than one which seemed to cure a passing ailment. And one which cures a passing ailment is not a cure because the ailment would cure itself in any event. Hence all remedies are vain.

We remember a much-discussed story about a woman who had an "issue of blood" for many years and had wasted her substance in going from doctor to doctor. She was healed by a miracle. We have often heard this event discussed. Some have denied the cure was miraculous; some have said it was psycho-physiologic; others have imagined some occult technique of which the record reports nothing. But had our five wise inquisitors been asked, we presume they would have said that the woman had lived so long it is likely she would have continued to live to a ripe old age, and in fact she was bound to get suddenly well at the precise moment when the alleged miracle occurred.

IS THE PULMOTOR TOO AUTOMATIC IN ACTION?

Three complaints are made against the pulmotor. One is its automatic activity taken in connection with the ease by which inspiration is turned in expiration. This can be corrected by the hand if necessary as the investigators admit. In fact, the insufflator recommended will not work in any other way. The objection is most obvious in the lower animals where the resistances are greater. The committee acknowledges that there may be differences between lower animals and men saying, "In lower animals, certainly, the blast often meets obstacles in passing from the larynx into the alveoli, and the inspiratory pressure of the automatic pulmotor is in many cases insufficient to overcome them."

A second complaint is that it effects expiration by suction. Reliance is largely placed on experiments with lower animals to prove that such suction is dangerous to lungs, bronchi and alveoli, and as we have said, such evidence is at least questionable. However, the committee quotes the experience of Dr. Morris Fishbein, who reported " a case in which a patient had been poisoned with carbon monoxide and was subjected to the action of the pulmotor for several hours. After nearly five days of unconsciousness the patient died. At the autopsy hemorrhage into the lungs and visceral pleura were found, together with subpleural emphysema (dilated areas) of the right lung, and the question was raised whether these pathological conditions did not result from the use of the pulmotor."

DID IT INJURE LUNGS, BRONCHI AND ALVEOLI?

But perhaps it would be pardonable to quote Dr. Fishbein at some length, which the committee fails to do. Under the heading, "Anatomic Diagnosis," referring to the patient, who was a colored adult, he says the following conditions were found: "Hemorrhage into the lungs and visceral pleura, subpleural emphysema of the right lung (following the use of the pulmotor?) engorgement of the pial vessels, edema and petechial hemorrhages in the lining of the small bowel, petechial hemorrhages in the lining of the greater antrum of the stomach and in the lining of the duodenum distal to the ampulla of Vater, hyperemia of the kidneys, small hemorrhages and slight edema of the lining of the base of the bladder" and 15 other adverse conditions.

All the lesions above given have reference to escape or engorgement of blood or its purple mottlings of the surface except emphysema, which refers to the presence of gas in the serum. So it is clear that for some reason the whole blood of this negro was affected, whether by the action of the pulmotor, by the withdrawal of 12 oz. of blood followed by intravenous transfusion of saline solution by the drop method practically continuously for five days, or by reason of the changes which took place after the patient died. It is to be noted that the committee failed to mention the other methods of resuscitation which the doctors at the Cook County Hospital adopted and said nothing about the work of the undertaker.

The reader will note that the date of the autopsy was not given by Fishbein, so the committee appears not to have been in position to tell whether the hemorrhages and emphysema were not rather due to changes after death than to the unusually extended use of the pulmotor. But they passed over this possibility and over those sequent on intravenous transfusion, illuminating gas absorption and the care of the undertaker. Delafield and Prudden in their "Handbook of Pathological Anatomy and Histology" well say, "It is the novice in postmortem examinations who is particularly apt to mistake postmortem alteration for significant lesions."

EVIDENCES THAT HEMORRHAGES MAY BE DUE TO ILLUMINATING GAS

The bulletin quoted refers to Robert S. Combes' article, "Clinical Manifestations of Illuminating-Gas Poisoning," and states that he probably has had no experience with the pulmotor because he says, "Reports from all over the country relative to its efficiency have been received." Consequently his testimony based on 1000 cases of gas poisoning will be all the more acceptable. If he says certain conditions exist and he has not used the pulmotor, then the lesions are not the results of the use of that instrument. If on the other hand he has used it, his testimony in its favor is not to be discounted by the committee.

He says: "At postmortem examinations the organs are deeply injected (swollen with blood), especially the spleen. There may be scattered small hemorrhages and at times cerebral changes, particularly areas of softening in the lenticular nucleus, symmetrical in many cases." Under the "Sequels" of gas poisoning he lists cases of broncho-pneumonia. Is it possible that these instances are really cases of emphysema of the lungs?

Dr. McCombes also says, but the bulletin fails to quote him, that the prompt suction by the pulmotor of the carbon monoxide present in the residual air and that which is constantly eliminated from the blood materially aids resuscitation. He adds that the pulmotor has made the necessity for venesection and introduction of normal salt solution less frequent. As he is referring to gas poisoning he does not refer to the power of the pulmotor to remove water from the respiratory organs, a further quality in its favor.

After all, if the pulmotor is a device which can save life it is not to be condemned even if it is proved that after several hours of action on a patient hopelessly poisoned it produces both hemorrhage and emphysema. They are not such dreaded afflictions. Many a man near death has been saved at the cost of a leg or an arm. But there appears no reason to believe the action of the pulmotor is of the character suggested even when infants are subjected to its kindly ministration.

ARE NOT ALL INSUFFLATORS APT TO CHARGE AND DISCHARGE THE STOMACH?

There is left the third charge that the entrance of air into and the escape of air from the stomach may cause movements that simulate respiration, although no air enters or leaves the lungs. The same is true of the Meltzer insufflator when the belt and compress or the weights on the stomach are removed. It is probably an excellent practice to deflate the stomach in the use of a mechanical breathing apparatus.

Some points which the authors regard as minor are, however, true and ponderable. The pulmotor does not supply pure oxygen; it is heavy and expensive and may, though of this we are not sure, waste much oxygen. They might also add that the instrument is complicated and contains much rubber which may get out of condition. But the report seems unfair in its conclusions and should be revised. It advocates a form of insufflator which has apparently been praised by no one but the committee and has apparently never been used. Not even newspapers are its sponsors, and the Bureau of Mines even hesitated to give it its indorsement in the preface.

A First-Aid Manual

VEST-POCKET FIRST-AID BOOKLET. By Daniel E. Sable, M. D., Assistant Gynecologist to the South Side Hospital, Pittsburgh, Penn., and Police and Fire Surgeon, Department of Public Safety, Pittsburgh, Penn. 104 pp.; 3¼x5⅞ in.; 64 illustrations. National First-Aid Publishing Co., Nixon Building, Pittsburgh, Penn. Price, 50c.

This is a good little book, but not so lengthy as that published by the American Red Cross, and not so complete. It is much more handy than the Johnson & Johnson blue book, for it will slip into a vest-pocket without much violence. Its briefness is not in illustration but in comment, and the pictures tell their story better than a lot of text.

In his preface the author says he has avoided long words. He tells about an intelligent workman, tears furrowing his grimy face, who stood fumbling a bulky old-fashioned first-aid volume. "Why can't they use plain English?" he commented bitterly. Then the author adds: "That is exactly what I have attempted to do." Nevertheless, the reviewer was surprised to find on the first text page, despite the preface, some expressions he didn't know, to wit: asphyxia algida, asphyxia carbonica, and another expression no one ever saw before—asphyxia neonatarium (neonatorum, surely).

The doctors must be allowed their frailty, and this medico nearly all through the book certainly does avoid using long words and talks plain hard sense to the general public. In fact, it seems sometimes as if, like Uncle Dick, in one of Dickens' novels, he kept a page like page 7 on which to spread himself when the current of words caught him foul. He seems to be extremely practical despite his lapses, which are infrequent. But he wants us to use carron oil. It is alleged that Dr. Halberstadt is proud that the corks of the carron-oil bottles, which an ancient law compels him to keep, cannot be drawn and his belief in the mussiness and detestibleness of that offensive mixture is shared by almost the whole profession.

The little volume is handy and inexpensive and has been translated into German, Italian and Slavish.

Coal and Coke News

Harrisburg, Penn.

The counties included in each of the eight districts into which the state has been divided for the administration of the Workmen's Compensation Act have been announced by the Compensation Board.

The referees are to be appointed by Nov. 15 and two of them will be located in the Philadelphia district and two in the Pittsburgh district. One referee will be located in each of the other six interior districts.

Harrisburg, Reading, Scranton, Williamsport, Altoona and Erie are the headquarters for referees outside of the Philadelphia and Pittsburgh districts.

District No. 1 includes Philadelphia, Delaware, Chester, Montgomery and Bucks counties. The two referees of this district will have headquarters in Philadelphia.

District No. 2 includes Berks, Schuylkill, Lehigh, Northampton and Carbon counties. Headquarters of the referee to be at Reading.

District No. 3 includes Montour, Columbia, Luzerne, Monroe, Pike, Wayne, Lackawanna, Susquehanna and Wyoming counties. Headquarters of referee will be at Scranton.

District No. 4 includes Dauphin, Lebanon, Lancaster, York, Adams, Franklin, Cumberland and Perry counties. The headquarters of the referee will be at Harrisburg.

District No. 5 includes Tioga, Lycoming, Bradford, Sullivan, Union, Snyder, Centre, Clinton, Cameron, Potter and Northumberland counties. The headquarters of the referee will be at Williamsport.

District No. 6 includes Cambria, Blair, Huntingdon, Mifflin, Juniata, Fulton, Bedford and Somerset counties. The headquarters of the referee will be at Altoona.

District No. 7 includes Erie, Warren, McKean, Elk, Forest, Venango, Mercer and Crawford counties. The headquarters of the referee will be at Erie.

District No. 8 includes Lawrence, Butler, Clarion, Jefferson, Indiana, Armstrong, Westmoreland, Fayette, Greene, Washington, Beaver, and Allegheny counties. The headquarters of the two referees will be at Pittsburgh.

It is pointed out by members of the State Insurance Board that of all the methods of compensation liability insurance permitted employers in Pennsylvania, insurance in the state fund alone gives complete protection from personal liability and from the filing of liens on the employer's real property which may very probably hinder, if not prevent, its sale or its use as security for the borrowing of money.

Every other form of insurance leaves the employer personally liable, every agreement or award of compensation may be entered as a lien against his land and cannot be discharged until the whole compensation agreed upon, or awarded has been paid in full, which may not be for 8 or 10 years.

On the other hand, a subscriber to the state fund, by giving to the Department of Labor and Industry the same notice of an injury to an employee which he is now by law required to give relieves himself from all personal liability. The state fund immediately assumes all his obligations and no claims against him can become a lien or cloud on his property, real or personal.

In addition, the act creating the state fund makes a sufficient appropriation to pay all expenses. This, with the entire absence of agents' and brokers' commissions enables the state fund to give this complete protection practically at cost.

PENNSYLVANIA

Anthracite

Kingston—Judge Moser, of Sunbury has been assigned to hear arguments in the case of the Kingston Coal Co. against the Plymouth Coal Co., in which the former company claims the latter should keep its fans and pumps in operation in the Dodson colliery. The Dodson colliery has been abandoned and the Gaylord colliery of the Kingston Coal Co. is affected because an opening had been made in the barrier pillars.

Lansford—To further combat the progress of the fire that has for years been destroying coal, the Lehigh Coal & Navigation Co. is now engaged in laying a line of pipe to carry the great volume of water from the No. 8 tunnel and thus pour it into burning coal deposit.

Eleven miners employed in the Foster tunnel of the Lehigh Coal & Navigation Co., at Coaldale, were entombed shortly before noon, Sept. 27, by a sudden rush of water breaking through the roof from an abandoned working. Two of the 11 men were rescued alive and in good condition, Sept. 28, while officials of the company have hopes of getting out alive others of the men still imprisoned. While it is believed that none of these miners have been crushed under the fall, it is possible that some of them may have been drowned.

Jeddo—The Union Improvement Co., a corporation which leased coal tracts in Hazle and Foster Township to the G. B. Markle Coal Co., under certain mining conditions on a coal royalty basis has filed equity proceedings against the latter company and asks an accounting and a payment of royalties in excess of what has been offered. The leases were made in 1890 and extend for a period of 30 years. A clause in the leases provided an increased royalty for coal sizes larger than pea taken from the Mammoth and Wharton veins.

Shamokin—Recently a falling stack at the boiler-house of the Corbin colliery struck three men, instantly killing one and seriously injuring two others.

Bituminous

Connellsville—Production and shipments of Connellsville coke are about equal and stationary at 390,000 tons per week. It is stated that while there is no actual shortage of coke cars, there is no longer a surplus, and the railroads are requiring operators to move all cars on the tracks promptly.

Pittsburgh—It is estimated that the Pittsburgh district is short 15,000 men, and there is slight hope of making good this deficiency. Coal cars are in demand and some of the railroads have notified companies not to expect much above 60 per cent. of their normal supply. Traffic in coal continues to increase steadily.

Uniontown—Persistent reports here are to the effect that the W. J. Rainey Co. is to transfer its force of accountants and auditors from New York to the Uniontown offices and make the general offices of the interests in this city. It is reported on reliable authority that the Rainey company is negotiating for a tract in a recently opened residential section of the city on which it is proposed to erect 20 brick dwelling houses for these employees.

Recent advances in the price of coke have temporarily put an end to a movement on the part of prominent coke producers to bring before the Interstate Commerce Commission the conditions of this region as to rates on bituminous coal as compared with the Pittsburgh and Greensburg-Latrobe districts. Competition with these districts in the coal trade, according to the local operators, is impossible with the alleged discriminatory rates now in force. The movement was well defined a few weeks ago when a committee of three appointed at a meeting of merchant coke operators conferred with Philadelphia officials of the Pennsylvania R.R. The meeting came to naught and the coke men considered taking their complaint to the Commission but recent advances in the price of coke have caused the coal trade proposition to be temporarily abandoned. Quiet influences are still at work to center the sentiment of the coke operators in order that a concerted appeal may be made at some future time.

Star Junction—Twenty-one ovens have been fired at the Murphy plant of the Echard Coal & Coke Co. and more will be fired by the end of the next week.

WEST VIRGINIA

Mullins—It is the current belief that the Virginian railroad will soon extend passenger service from Mullins to Elmore, a distance of about 15 mi. This new branch extends through a rich coal section.

Fairmont—More than 40,000 copies of the mining law of West Virginia, as amended by the last Legislature, have been received by the secretary of the Central West Virginia Coal Operators' Association for distribution among the miners employed by the coal companies operating in the central part of the state. The pamphlets are printed in seven languages, English, Russian, Hungarian, Polish, Italian, German and Slavonian.

The mining plant of the Four States Coal and Coke Co., which has been closed since the first of August, will be started at once, and within 10 days 500 miners will be working. The continued improvement in the coal business is the reason for resuming operations. The plant has been in the hands of a receiver for some time, but it is assured now that it can be operated at a profit.

Charleston—A class of 170 miners recently took the examination for mine foremen and fire bosses. It is said that this is the finest class of miners ever examined, and that the majority of the men showed the necessary qualifications for the position to which they aspire.

Holden—Mine safety car No. 8 of the U. S. Bureau of Mines will arrive at Holden, Oct. 2, for the purpose of giving demonstrations in mine rescue and first-aid work. The car will remain here until Oct. 14, during which period lectures will be given relating to rescue work. From here the car will go to Omar, W. Va., to remain until Oct. 27, after which it will proceed to Ethel, W. Va., remaining there until Nov. 9.

KENTUCKY

Middlesboro—The next quarterly meeting of the Southern Appalachian Coal Operators' Association will be held in this city on Oct. 22, this being the first time in the history of the organization that a meeting has been held outside of Knoxville. The reason for the change is that it is hoped more operators will attend, Middlesboro being nearer the center of the territory.

In addition to a car shortage which is affecting the operations in this territory it is stated that a labor shortage, to be charged in part to restriction of foreign immigration during the last year or more, will be noted before the winter is over.

Whitesburg—It is stated here that the mines of the Elk Horn Mining Corporation at Hemphill on Yount's Fork will resume in full shortly, giving employment to from 200 to 300 men. These mines have been idle since last November, although the company's plants in Fleming and Haymond have been running full time for several months turning out a large output.

Some coal operators of the eastern Kentucky field complain of a car shortage along the Louisville & Nashville R.R. which is affecting, somewhat, the mining activity, although operators insist that business is fairly good. Prospects look encouraging also for the business in the future, and the railroads promise to remedy the car shortage.

OHIO

Columbus—Statistics are being compiled by the Ohio Industrial Commission showing the average yearly earnings of coal miners in the state. This work is being carried on by Fred C. Croxton, chief statistician who is compiling figures on all of the employees of the state.

ILLINOIS

Millstadt—The Lippert Bros. Coal Co., recently organized, has opened a mine half a mile southeast of Millstadt. The shaft is 40 ft. deep. The Buxton & Miller Coal Co. has reopened an old drift mine one mile south of Edgemont, which will be known as the Buxton mine.

Belleville—The International Coal Co. has electrified its mine by installing a fan motor and electric mining machines and a substation containing one 150-kw. 250-volt 525-ampere generator, driven by a 220-hp. motor, power for which is furnished by the Southern Light & Power Co. The Superior Coal Co. has installed electric motor haulage consisting of one 8-ton mine motor, a 75-kw. 250-volt 525-ampere generator, driven by a 150-hp. motor, power for which is furnished by the Suburban Railroad Co.

The fifth annual report of Thomas C. Wright, inspector of mines for St. Clair County, shows that there are 69 mines in the county, against 71 last year, and that of these 17 are not being operated, against 15 last year. The total output for the year ending June 30, 1915, was 3,017,820, against 4,117,002 last year. Of the 52 mines in operation 36 were shipping and 16 were local operations. Five men were killed in mine accidents in the county during the year and 36 were so badly injured as to be disabled 30 days or more. The company which hoisted the most coal from one mine was the St. Louis & O'Fallon Coal Co., with a total output of 643,615 tons. The Consolidated Coal Co. hoisted 468.730 tons from one mine The Taylor Coal Co. hoisted 295,319 tons from two mines, the Southern Coal, Coke & Mining Co., 144,386 tons from one mine and the Suburban Coal & Mining Co. 127,780 tons from one mine.

Harrisburg—Reduction of the salaries of superintendents, assistant superintendents and bosses at the O'Gara mine No. 9 came near precipitating a strike of those functionaries recently. These men however finally decided to accept the reduced salaries and keep their jobs.

Springfield—It has been found advisable to postpone the examination for the office of chief clerk of the mining board until Nov. 6 in order that wider publicity might be given and a greater number of applications secured.

IOWA

Des Moines—James Finney, coal miner, who lost an eye in a mine accident at Bussey, Ia., has informed the Iowa Industrial Commission that he will claim compensation for complete disability under the workmen's compensation act. Finney had but one good eye when he went to work for the coal company. The question to be submitted to arbitration is whether the employer can be compelled to pay a workman for total disability when he loses his second eye.

The Keystone mine, operated by the Keystone Coal Co., has resumed operations after a shut down of 4 days to correct conditions complained of by the mine inspectors.

Centerville—An examination for mine foreman and hoisting engineers will be held at Centerville on Oct. 5 and 6. Candidates for these certificates will be required to answer satisfactorily 12 written and 8 oral questions.

NORTH DAKOTA

Wilton—The mine of the Washburne Lignite Coal Co. is busy as orders from all over the state have been received in considerable abundance, and shipping is at the rate of between 25 and 30 cars per day. Since the new coal rate has gone into effect, the local plant has been obliged to put on more men in order to supply the trade. With prospects of an early fall and severe winter, this mine is preparing for the biggest year in its history.

COLORADO

Trinidad—Naturalization schools for adult coal-mine workers will be organized at a conference to be called here October 11. Mary C. C. Bradford, state superintendent of public instruction, the superintendents of schools in Huerfano and Las Animas counties and the sociological department of the Colorado Fuel & Iron Co. will then convene and visit the leading southern Colorado coal camps with the object of deciding the best means of accomplishing desired results.

PERSONALS

F. L. Garrison, sales agent of the Pittsburgh-Westmoreland Coal Co. at Buffalo, N. Y., has resigned his position to go into other business.

E. J. Conroy, formerly sales agent for Castner, Curran & Bullitt, has been appointed resident manager for C. C. Corey, at Grand Rapids, Mich.

William Jay Turner was on Sept. 25 appointed general counsel of the Lehigh Coal and Navigation Co., in the place of Samuel Dickson, deceased.

James B. Mahon and D. D. Hull were recently elected directors of the Virginia Coal & Coke Co. to succeed B. P. Learned, and Henry K. McHarg.

Wm. J. Turner has been elected general solicitor for the Lehigh Coal & Navigation Co., filling the position made vacant by the death of the late Samuel Dickson.

S. D. Forbes, in recent years sales manager of the New England Coal & Coke Co., is now manager of sales for S. P. Burton & Co., Boston, New England representatives of the Crozer-Pocahontas Company.

F. F. Morris recently returned from the German office of the Draeger Oxygen Apparatus Co. to Pittsburgh, and is prepared to proceed with the manufacture of helmets and other oxygen apparatus in this country.

F. R. Wadleigh sailed from New York on Sept. 29 for the purpose of investigating coal markets in France, Spain and Italy in particular, and is not expected to return until December. Mr. Wadleigh is representing some large American coal interests.

W. E. Hardy, for the past 11 years connected with the Diamond Rubber Co. and the B. F. Goodrich Co., being lately in charge of the sales department of the mechanical rubber-goods division, has been appointed sales manager for the Boston Belting Co., of Boston, Mass.

Secretary B. F. Nigh, of the Michigan-Ohio-Indiana Coal Association, reports quite an increase in the membership of the association since the annual convention held at Cedar Point in June. In the last 60 days more than 40 new members have been added to the rolls. In the same period the association has collected more than $800 freight claims against railroads for its members.

John Harding, identified with the Connellsville coke industry for a number of years has assumed the superintendency of the Garwood plant of the Aetna Connellsville Coal & Coke Co. He succeeds C. L. Patterson. Mr. Harding's home is in Uniontown, Penn., where he has successively been employed by the H. C. Frick Coke Co. and several independent concerns. He was lately in business for himself.

Clarence J. Hicks, formerly with the International Harvester Co. and for many years prominent in Y. M. C. A. work, has been appointed executive assistant to J. F. Welborn, president of the Colorado Fuel & Iron Co. Mr. Hicks in addition to his general duties as full assistant to Mr. Welborn, will have charge of the social service and general betterment work which the company has lately instituted.

John S. Johnson, for a number of years outside superintendent for the Lehigh Coal & Navigation Co., has been appointed inspector of construction work for the Hudson Coal Co. Mr. Johnson, whose duties will be the superintending of repairs to breakers and construction of all descriptions around them, will work under the direction of Eli T. Conner, chief consulting engineer of the Hudson Coal Company.

Vice-President Charles O'Neill, of District No. 2 bituminous field, of the United Mine Workers of America, recently stated that this district was 10,000 miners short of the usual working forces as a result of the European war and the demand for men in steel and allied industries. Thousands of men have gone to Europe to join the armies of their respective countries. With only a normal demand for coal this winter, it is stated, there will be a decided labor famine.

TRADE CATALOGS

The Stevens Co., Pittsburgh, Penn. "Modern Mine Cars." Illustrated, 8 pp., 6x9 in.

Lea-Courtenay Co., Newark, N. J. "Centrifugal Pumps." Illustrated, 64 pp., 6x9 in.

Morse Chain Co., Ithaca, N. Y. "A Chain of Evidence." Illustrated, 20 pp., 6x9 in.

Skinner Engine Co., Erie, Penn. "The Universal Unaflow." Illustrated, 28 pp., 8½x11 in.

Badger Fire Extinguisher Co., Boston, Mass. "Neglect = Ashes." Illustrated, 16 pp., 3½x6 in.

The Carnegie Steel Co., Pittsburgh, Penn. "Structural Beams." Illustrated, 12 pp., 5x7½ in.

D. & W. Fuse Co., Providence, R. I. "There Are Reasons for This." Illustrated, 16 pp., 3½x6 in.

Betson Plastic Fire Brick Co., Rome, N. Y. "Betson Plastic Fire Brick." Illustrated, 20 pp., 4x9 in.

Badger Fire Extinguisher Co., Boston, Mass. "Badger Fire Extinguisher." Illustrated, 16 pp., 3½x6 in.

Atlas Preservative Company of America, New York. "Atlas 'A' Wood Preservative." Illustrated, 16 pp., 4x8 in.

Badger Fire Extinguisher Co., Boston, Mass. Badger 40-Gallon Chemical Engines." Illustrated, 6 pp., 5½x7 in.

Badger Fire Extinguisher Co., Boston, Mass. "Badger Chemical Fire Engine." Illustrated, 4 pp., 5½x7¼ in.

The Stow Manufacturing Co., Binghamton, N. Y. "Portable Tools of Proven Value." Illustrated, 20 pp., 3½x6 in.

Western Electric Co., New York. "Mine Telephone Systems and How to Install Them." Illustrated, 41 pp., 7½x4½ in.

Joseph Dixon Crucible Co., Jersey City, N. J. "The Use and Abuse of Ball and Roller Bearings." Illustrated, 20 pp., 6x9 in.

Robert A. Keasbey Co., New York. "Carey System of Insulation for Underground Steam Pipes." Illustrated, 4 pp., 7x12 in.

Standard Underground Cable Co., Pittsburgh, Penn. "Pointers on Telephone Cable Specifications." Illustrated, 31 pp., 3½x6 in.

The Atlas Preservative Company of America, New York. "Stationary service, Atlas 'E' Boiler Preservative." Illustrated, 24 pp., 4x8 in.

Robert A. Keasbey Co., New York. "Insulate Underground Pipes in This Easy and Permanent Manner." Folder, 6 pp., 8½x6 in. Illustrated.

PUBLICATIONS RECEIVED

Department of the Interior, Bureau of Mines. Miner's Circular 18. "Notes on Miner's Carbide Lamps," by James W. Paul. Unillustrated, 11 pp., 6x9 in.

Department of the Interior, Bureau of Mines. Thechnical Paper 110. "Monazite, Thorium and Mesothorium," by Karl L. Kidhil. Unillustrated, 32 pp., 6x9 in.

Department of the Interior, Bureau of Mines, Technical Paper 83. "The Buying and Selling of Ores and Metallurgical Products," by Charles H. Bolton. Unillustrated, 53 pp., 6x9 in.

Department of the Interior, Bureau of Mines. "Monthly Statements of Coal Mine Fatalities in the United States, June, 1915." Compiled by Albert H. Fay. Unillustrated, 15 pp., 6x9 in.

Department of the Interior, Bureau of Mines. Bulletin 75. "Rules and Regulations of Metal Mines," by W. R. Ingalls, James Douglass, J. R. Finley, J. Parke Channing and John Hays Hammond. Unillustrated, 296 pp., 6x9 in.

Department of the Interior, Bureau of Mines. "United States Mining Statutes, Annotated," by J. W. Thompson. Bulletin 94, Part 1, Sections and Statutes Relating to Metaliferous and Coal Mining." Unillustrated, 860 pp., 6x9 in.

Department of the Interior, Bureau of Mines. Technical Paper 109. "Composition of the Natural Gas Used in 25 Cities with a Discussion of the Properties of Natural Gas," by G. A. Burrell and A. G. Oberfell. Unillustrated, 26 pp., 6x9 in.

INDUSTRIAL NEWS

Buffalo, N. Y.—The John K. Kerr, Inc., Coal Co., lately organized, has opened an office at 39 Erie St. Mr. Kerr is president and general manager.

Muskogee, Okla.—The Oklahoma Consolidated Coal Co. has been incorporated with a capital stock of $500,000. The incorporators are R. T. Price, E. A. Jennings, and E R .Jones, all of Muskogee.

Terre Haute, Ind.—The Interstate Mining Co. has been incorporated here, with $5,000 capital stock, to do a mining business. The directors are F. G. Fisbeck, I. H. Woolley and George H. Richards.

Powhatan, W. Va.—It is announced by the management of the Powhatan Coal & Coke Co., of Powhatan, W. Va., that the company will construct a tipple at a cost of $45,000 to replace the one which burned recently.

Denver, Colo.—Rumors that the James J. Hill interests were negotiating for the Rockefeller holdings in the Colorado Fuel & Iron Co. have been denied. Hill personally refused to discuss the matter but his secretary denied the entire report.

Huntington, W. Va.—The Chesapeake & Ohio R.R., it is believed, will load more coal in 25 days in September than it did in 26 in August. Several circumstances combine to make coal prospects brighter than they have been before in many years.

Lex, W. Va.—The Rocky Branch Pocahontas Coal Co. was recently organized with a capital of $5,000. The incorporators are H. J. Brooke, Edythe Brooke, and J. A. Thorn, of Welch, W. Va., and Archibald Shimmin, and D. R. Hopkins, of Bluefield, W. Va.

Hartshorne, Okla.—The McAlester Colliery Co. of Hartshorne has just been incorporated with a capital stock of $50,000. Incorporators are: S. L. Moreley, Oklahoma City; H. P. Rivers and W. J. Hulsey, of Hartshorne. The company will operate mines near McAlester.

Grafton, W. Va.—It is stated that the labor question is rapidly growing more and more serious in this region. It is stated by some authorities that the coal business in West Virginia cannot be materially increased at present owing to the fact that no more laborers can be secured.

Crewe, Va.—The Wilson-Berger Coal Co. has been incorporated with a maximum capital stock of $350,000, and a minimum of $50,000. The incorporators are C. E. Wilson, president, Crewe, Va.; William H. Mann, and W. H. Mann, Jr., of Richmond, Va.; P. C. Berger, of Chatteroy, W. Va.

Baltimore, Md.—At a recent meeting of the board of directors of the Baltimore & Ohio R.R., authority was voted for the construction of a coal pier at the Curtis Bay terminal at Baltimore. This will have an estimated capacity of 10,000,000 tons per year, and will cost approximately $1,500,000.

Clarksburg, W. Va.—The Central Fairmont Coal Co. recently closed a yearly contract with a railroad for the latter's entire requirements of coal, and is now employing about 100 additional miners. This firm has also purchased additional live stock for the purpose of meeting the increased production.

Charleston, W. Va.—The Island Creek Coal Co., a corporation of the State of Maine, was recently admitted to do business in the State of West Virginia. The capital stock is $250,000, while the assessed valuation of the property owned by the company in the state is over $2,300,000, most of which lies in Logan Copnty.

Carterville, Ill.—William E. Trautmann of East St. Louis, receiver for the Carterville Coal Co., Carterville, Ill., has filed a petition with the United States District Court for permission to sell the mines of the company. The mines, under ordinary conditions, are estimated to be worth $150,000. The indebtedness of the company is $85,000.

Louisville, Ky.—Articles of incorporation have been filed here by the Nashville Mining Co. with a capital of $11,000 and a debt limit fixed at $25,000. The company proposes to operate mines and leases, hold, buy and sell coal, clay and other mineral lands. G. W. Hardin, B. H. Farnsley and Clarence Dallam are the incorporators.

Huntington, W. Va.—Default having been made on the payment of bonds of the Branchland Coal Co., issued in 1907, the Equitable Trust Co. of New York, has advertised the property situated in Logan County for sale on Wednesday, Oct. 20. The bonds are for $150,000, while the estimated value of the property is between $250,000 and $300,000.

Pottsville, Penn.—The Eastern Pennsylvania Coal Co., of Middleport, Schuylkill County, has been finally adjudged by the U. S. District Court at Philadelphia as an involuntary bankrupt. The company was formed to operate an abandoned working near here, but the enterprise did not meet with success, as it was found too costly to mine the coal.

Huntington, W. Va.—A 60-mile extension of the Virginian R.R. is now in process of construction. This railroad will run from Mullen through Pineville, Winden, Baileysville, and along the Guyan Valley through Gilbert in Mingo County to Mann in Logan County. All the rights of way have been secured, and forces are engaged in grading preparatory to the laying of rails.

Baltimore, Md.—Announcement was recently made here to the effect that the Alabama Co., the successor to the old Alabama Consolidated Coal & Iron Co., has just closed a deal for the sale of approximately 400 acres of its coal lands, located in the Birmingham district of Alabama. The price which the purchasers paid for the property was in the neighborhood of $80,000.

Whitesburg, Ky.—C. A. McIntyre, B. P. Young and others are negotiating for the purchase of a large tract of coal and timber land above here on the Louisville & Nashville R.R. in the Elkhorn coal field of Letcher County. In the event of the deal being completed work of development such as the opening of mines, grade work, the building of miners' houses, etc., will be started immediately.

Huntington, W. Va.—The Pond Fork Ry. Co. was recently incorporated with a capital stock of $26,000 for the purpose of constructing and operating a railroad from Madison, Boone County, up the Pond Fork of Coal River to the head waters of Pond Fork, a distance of about 25 miles. The incorporators are R. M. Baker, Herbert Fitzpatrick, J. A. Hagen, Jr., George Garred, and F. B. Enslow, of Huntington, W. Va.

Artemus, Ky.—The Jackson Coal Mining Co. has taken over the operations formerly conducted in the name of the Dean Coal Co., near Artemus. The main office of the new company is in Knoxville, Tenn., in charge of A. B. Day, of the Sanford-Day Iron Works, as president, and D. H. Jenkins, of the Proctor Coal Co., as secretary. The operations will be in charge of W. B. Kinder, superintendent, at Artemus.

Columbus, Ohio—The Ohio Coal Washing and By-Products Co. has been incorporated with a capital of $50,000 to erect and operate a coal washery at some location in the Hocking Valley. The location is to be fixed at a later date. The incorporators are William Job, E. E. Hazelton, E. E. Learned, Arthur F. Ayers and H. L. Sibley. The leader in the movement, William Job, is well known in coal circles in the Buckeye state.

Cincinnati, Ohio—The Kellioka Coal & Coke Co. has filed in the United States Circuit Court of Appeals its appeal asking the reversal of a judgment of the Federal Court in Kentucky, under which it was adjudged to be the holder of a fraudulent deed to several hundred acres of coal land in Harlan County, Ky., valued at $20,000. Z. B. Brock, the former owner of the land, claimed that he had been induced to part with title for an inadequate consideration.

Pineville, Ky.—The Creech Coal Co., with Robert Creech as president and general manager, capitalized at $200,000, has just been incorporated. The Banner Fork Coal Co., with W. J. Cunningham as president and L. P. Johnson as secretary and treasurer, has been incorporated with a capital of $100,000. Both of these companies contemplate operations on the recently extended branch of the Louisville & Nashville R.R. up Wallins Creek in Harlan County.

Louisville, Ky.—Bondholders of the Consolidated Coal Co., owning and operating mining properties in eastern Kentucky, are said virtually to have agreed to a proposition whereby they are to receive half the interest on their bonds during the next two years, with the understanding that the other half due them is to accumulate for payment at such times in the future as the company's finances will justify settlement in full. The company has outstanding a little less than $3,000,000 in bonds.

Philadelphia, Penn.—All the large shippers of coal in this territory have been notified by the various railroads of the car shortage which is becoming more serious as the season advances. Recently the Baltimore & Ohio began to place the operators in this district on the percentage basis, and the same company has issued a letter to all large shippers urging that they use care in making shipments and in addition to do all in their power to release cars at unloading points as promptly as possible.

Hickman, Ill.—The Nashville, Chattanooga & St. Louis R.R. Co. has announced that it will not take advantage of a ruling of the Interstate Commerce Commission allowing it to charge $1.50 per ton on all coal delivered to Hickman. The rate announced is $1.35. The old rate was $1.20. An attempt was made by the company to put the $1.50 rate into effect, but appeals were made to the Commission and the matter was held up for several months. The railroad company finally announced the $1.35 rate.

Charleston, W. Va.—The Kanawha Coal Shippers' Association is contemplating arrangements designed to meet the situation which will arise in case the proposed increase of 15c. in the rate from West Virginia coal fields to Western points is adopted. The plan as tentatively settled upon provides for the establishment of big storage and distribution centers at Marietta, Portsmouth and Cincinnati, Ohio, Huntington and Pt. Pleasant, W. Va., and Evansville, Ind., to which coal will be sent by river from various West Virginia river points at which loading plants will be erected.

Philadelphia, Penn.—Nothing has stirred the coal operators in the West Virginia fields recently as has the request of the four trunk-line roads in the state applying to the Interstate Commerce Commission for permission to advance the rates on bituminous coal 15c. per ton. As a consequence of this action by the railroads the prominent producing interests held a meeting in this city recently to map out a course of action to combat that of the railroads. The operators contend that to allow such an increase will badly cripple the coal business of the entire state, together with all other industrial enterprise closely allied with it.

Pittsburgh, Penn.—The Westinghouse Electric & Mfg. Co. has been awarded a number of prizes and medals at the Panama-Pacific International Exposition. Among these was a gold medal for the most complete and attractive installation in the palace of transportation. Gold medals were also received on a number of different classes of apparatus, among which are steam turbines, alternating- and direct-current generators, alternating- and direct-current railway motors, transformers, rectifiers, starting, lighting and ignition systems, switchboards and accessories, and mining locomotives. A grand prize was also received on a 4,000-hp., 650-volt, direct-current, double-unit Pennsylvania electric locomotive.

Philadelphia, Penn.—Contrary to opinion expressed at the time the railroads obtained a delay of two months before the enforcement of the new anthracite rates as ordered by the interstate commerce commission, it now appears likely that the companies will ask for a rehearing of the entire case. When the postponement to Dec. 1 was asked for it was stated that the delay was made to permit the railroads to check their tariffs in order to find any errors or discrepancies in the new rates. It is alleged that the companies will base their reason for a new trial on the fact that not a single member of the interstate commerce commission personally heard the testimony. In the beginning Commissioner Marble sat for two days, when he was taken ill and died. After that the testimony was completed by an examiner and the decision of the commission was founded on the information elicited by him.

Coal Trade Reviews

General Review

Cold snap stimulates the anthracite trade. Bituminous stiffer but not particularly active. Further advance in vessel rates checks exports. Car supply becoming the predominating feature at interior points.

Anthracite—The return of lower temperatures has precipitated a general buying movement and the new month has opened with anthracite fairly active. Orders are becoming urgent and indications point to a consistent improvement from now on. The frequent predicitions of the summer months, that consumers were failing to stock, have been fully sustained by the heavy buying developed by the first appearance of cold weather. In retail circles, however, there is still considerable competition, which continues to force some low prices in spite of the fact that wholesalers are showing a stiffening tendency as regards quotations. Steam sizes are particularly strong. The possibility of labor difficulties next April is also coming in for more consideration as the season advances, and it is noted that manufacturers are here and there laying by a few cars of coal of steam sizes against a possible future emergency.

Bituminous—The return of more seasonable weather has created a better feeling in bituminous and the market is appreciably stiffer, though not particularly active. It is noted that the railroads continue stocking operations and the larger manufacturers are being influenced to do likewise. Consumers are demanding close to the maximum tonnages on contracts, and occasional requests for urgent shipments are even being received. Buyers are showing a disposition to cover their requirements, but operators are not inclined to consider business ahead at the prevailing low figures. Some of the better grades are already practically out of the market and uncertainties in the car and labor supply are now definite factors in the situation.

Exports—Scarcity of vessels and a larger internal consumption have created a momentary relapse in the foreign business, but inquiry continues very persistent and there is every reason to anticipate a heavy demand through the balance of the season. The foreign trade is still largely predominated by the freight market, which has advanced still further, under the influence of a heavier demand for grain vessels. Tonnage is very scarce even at the new high level. Coastwise rates have not changed materially, but there is a notable absence of sailing vessels, most of the latter now being engaged in the off-shore business.

Lake Markets—The growing car scarcity is gradually looming up as the predominating feature in the coal markets. Nearly all districts are beginning to feel the pinch, and shippers are generally declining orders where special equipment of any kind is specified. Lake shipments are somewhat heavier than a month ago, but it is gradually developing that the closing period of navigation will not experience such a rush as was anticipated. The August shipments from the Upper Lake ports to interior points show a substantial increase over July, but the gross movement for the season to date is slightly behind last year, and there is only a little storage room available, this being held for some special grades.

Middle West—Noticeably cooler weather with frost in some localities has started coal moving into the consumers' bins, while dealers are giving greater consideration to their stocks, and the situation is generally active on the domestic grades. Buying is being resumed on a broad scale and there is little cheap coal offered. A definite car shortage at this time, some mines losing one and two days per week, is causing noticeable anxiety as to the outlook later when the winter trade gets under way. The railroads are still absorbing a heavy tonnage for stocking purposes, while there is a good movement of Illinois coals into the Northwest, all rail. Business in this direction is growing steadily and showing indications of a strong, persistent demand throughout the balance of the season.

A Year Ago—Domestic grades of anthracite in strong demand, but steam sizes are heavy. Bituminous still slowing down though prices are well maintained. Industrial demand suffering from generally adverse conditions.

BUSINESS OPINIONS

Iron Age—Signs of increasing home consumption are plainer as the steel trade enters the last quarter of the year. The upward trend of prices is, if anything, more marked, and inquiry for rolled steel for the first quarter of next year is broadening. The problem of the bar mills in making deliveries on home contracts, and at the same time meeting the demands for war steel, is growing more difficult. A Cleveland company closed this week with the Lackawanna Steel Co. for 35,000 tons of bars, deliveries extending over twenty months. New orders for shell steel are coming out constantly. Additional requirements for France that will come to the mills when the present French contracts are finished in February amount to 300,000 tons.

American Wool and Cotton Reporter—The wool market is still quiet, but has a firm undertone. The lifting of the British import on crossbreds, it is felt, will make the American market unsteady to a certain extent and may tend to lower the prices of medium wool, although the depressing influence will be only temporary. All indications point toward further advanced prices for wool. These will take place, it is thought, on each big buying movement.

Philadelphia News Bureau—The completion of the Anglo-French loan is the important feature of the moment. This settles a most difficult problem. The joint note offered is probably the strongest foreign note that could be offered. The victory of the allies in the western front has added strength to the loan. But besides the loan, the beginning of the heavy crop movement and the strong position of the banks help. Sterling exchange should gradually advance more to the normal and yet the import point of exchange will be much below the old-established basis. The tendency of sterling is bound to be downward because of the fact that our exports of merchandise is to be so largely in excess of our current imports.

Dun—Commercial enterprise responds to the stimulus of lower temperatures, which accelerate a broader distribution of fall wearing apparel and other merchandise. Industrial operations, notably in iron and steel and allied lines, continue apace and full employment of labor, in a number of instances at advanced wages, materially enhances the purchasing power of the people. Savings bank deposits, drawn down during the late period of depression, are again accumulating, and practically unlimited financial resources are available for facilitating the return of national prosperity.

Bradstreet—Trade currents are running more freely than heretofore; remaining obstacles to progress are passing; growth is of the cumulative type; sections somewhat pessimistic a while ago are now taking a brighter view of the future, and international political and financial matters apparently have assumed more pleasant aspects. Three forces loom large in the week's expansion—cold weather, higher prices for cotton and foreign orders for munitions of war.

Southern Lumberman—The steadily improving outlook which has been noted in the yellow pine market for the last four weeks or more has now begun to be converted into actual business, and prospects for greater improvement are better than at any time in months. Reports received this week from the producing territory of the South and from distributing markets of the Middle West are uniformly optimistic, and show more business done and at better prices than during any recent week. Actual fall trade has now begun in the hardwood market. This is shown by better demand from furniture manufacturers, by continued call from the railroads and car shops, and heavier buying by automobile and implement factories than has characterized the market for several weeks.

Marshall Field & Co.—Current wholesale distribution of dry goods has been more satisfactory than for some time past. Orders received daily have shown a material increase consistent with the more seasonable weather. The total number of buyers in the market this week was considerably more than a year ago. Collections have been good, and shipments of merchandise considerably ahead.

ATLANTIC SEABOARD

BOSTON

Slow improvement in Pocahontas and New River. Railroads stock up more than usual but no like move among manufacturers.. Water freights continue the same and anthracite is steady after a dull September.

Bituminous—Now that the weather is more seasonable there is a renewed optimism over fall trade in Pocahontas and New River. Progress, however, is very slow. Coal is in ample supply at all the Hampton Roads piers, but the slow movement of boats coastwise is partly responsible for the accumulations. Export inquiry is fairly constant and there is apparently every reason to count on an active demand from this quarter the balance of the season. A shortage of equipment on the coal roads is beginning to be talked in this territory but buyers here are seldom interested in such predictions until prices actually begin to move up.

Some of the New England railroads are stocking up to a greater extent than usual and this is expected later to influence some of the larger manufacturers to do the same. Receipts on contract are now only about normal, but if conditions are good it is expected they will increase as the month goes on.

Georges Creek is coming forward in about normal volume. The shippers are now fairly well caught up on contracts and have spot coal available in limited quantities on about the contract range of price.

Sales agents for the Pennsylvania grades are already canvassing with a view to next senson's business. In some cases prices are being named subject to advances in the mining scale and in tolls to tidewater. Should there be a greater advance in tolls on the railroads from West Virginia than from the Pennsylvania districts there would probably be a largely increased opening for the Pennsylvania grades.

Water Freights show no material change; 75@80c. is the prevailing rate on 2,500 tons upward, Hampton Roads to Boston, but there is still a dearth of sailing vessels. Most of the latter are still engaged in off-shore business.

Anthracite—September was a very disappointing month for retailers. As a result, the fall trade will be rushed the latter part of October and in November when dealers least need orders. As it happened, the warm spell coincided with the fog along the coast, and most of the companies are still reasonably well supplied with orders. At the same time there is no difficulty about securing any sizes the customer requires.

Bituminous quotations, f.o.b. loading ports at points designated, are about as follows per long ton:

	Philadelphia	New York	Baltimore	F.O.B. Mines
Clearfields	$2.15@2.65	$2.45@2.95	....	$0.90@1.40
Cambrias and Somersets	2.40@2.90	2.70@3.20	....	1.15@1.65
Georges Creek	2.92@3.02	3.22@3.32	$2.85@2.95	1.67@1.77

Pocahontas and New River prices on cars at Boston are $3.55@3.73, Providence,$3.50@3.68, and f.o.b. loading port at Hampton Roads, $2.80@2.85.

NEW YORK

Anthracite situation improves. Demand better and prices for individual coals stronger. Better feeling in soft-coal market. Car and labor situation serious. Contract holders taking full quotas.

Anthracite—The anthracite market shows improvement. Lower temperatures caused a better demand and independent operators are receiving higher prices than for some weeks past. Demand from the West continues brisk and consumers are being urged to stock up while transportation conditions continue favorable. The companies continue to store large quantities of all sizes, particularly the smaller buckwheat coals.

Individual coals are now within about twenty cents of the companies' circular. Nut coal seems to be the only one of the prepared sizes causing any trouble to shippers. Demand for pea and No. 1 buckwheat remains about the same. Nos. 2 and 3 are shorter. Considerable of these coals are being stored by the operators in anticipation of winter demands. The next week or ten days will, however, see a big change in the steam-coal situation, owing to the heat being turned on in the big office buildings.

The line trade shows much improvement. Demand from New England is notably better. Mine prices are as a rule a trifle stronger than at tidewater. Shippers complain of the scarcity of small cars and operators are beginning to feel the effects of labor shortage.

Current quotations at tidewater, per gross ton, f.o.b., are as follows:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$5.05		$5.10	
Egg	5.30	$5.00@5.30	5.35	$5.10@5.35
Stove	5.30	5.00@5.30	5.35	5.10@5.35
Chestnut	5.55	5.00@5.55	5.60	5.10@5.60
Pea	3.50	3.25@3.50	3.55	3.50@3.55
Buckwheat	2.75	2.25@2.75	2.80	2.25@2.80
Rice	2.25	1.85@2.25	2.30	2.00@2.30
Barley	1.75	1.50@1.75	1.80	1.75@1.80

Bituminous—There is a better feeling in the bituminous situation. Demand is stronger and there has been a general advance of from five to ten cents on nearly all grades. Dealers are encouraged but look for still greater changes for the better.

The question of cars is becoming serious and operators are now feeling the scarcity of labor more than ever before. New contracts are being entered into with some hesitancy because of these conditions.

Mine prices for line trade are in some instances, much stronger than for tidewater shipments. Consumers are taking everything possible on their contracts and some large manufacturers are wiring for prompt shipments. The local docks have no accumulation and the harbor is comparatively free of demurrage coals.

Shipments of export coal are being restricted by a shortage of bottoms. The demand contines heavy but the inability to close contracts for vessels is causing shippers to hold off.

Quotations on various grades, per gross ton, f.o.b. Tidewater, are as follows:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.20@3.30	$3.20@3.30	$3.20@3.30	$1.75@1.85
Georges Creek Tyson	2.95@3.00	2.95@3.00	2.95@3.00	1.40@1.45
Clearfield:				
Medium	2.65@2.80	2.55@2.65	....	1.10@1.25
Ordinary	2.55@2.60	2.55@2.60	....	1.00@1.10
Broad Top Mountain				1.10@1.45
Cambria County:				
South Forks	2.90@3.05	....	....	1.35@1.50
Nanty Glo	2.75@2.80	....	....	1.20@1.25
Barnesboro	2.65@2.70	....	....	1.10@1.15
Somerset County:				
Quemahoning	....	2.80@2.90	2.80@2.90	1.25@1.35
Medium	2.65@2.70	2.65@2.70	2.65@2.70	1.10@1.15
Latrobe	2.45@2.55	....	....	.90@1.00
Greensburg	2.75@2.80	....	....	1.10@1.15
Westmoreland	3.15@3.20	....	....	1.40@1.50
West Virginia Fairmont ¾		2.70@2.80	2.70@2.80	.90@1.10
Fairmont mine-run		2.60@2.70	2.60@2.70	.80@ .90
Steam		2.45@2.50	2.45@2.50	.90@ .95
Western Maryland		2.35@2.40	2.35@2.40	.85@ .90

PHILADELPHIA

Cold weather helps anthracite. Prices show indication of recovery, although cheap coal is still to be had. All steam sizes in fair demand, and some manufacturers begin to stock. Bituminous prices slightly higher. Export business quiet, but outlook is favorable.

Anthracite—The change in the weather has brought about the favorable conditions expected, but too late to prevent September being classed as a most unsatisfactory month. However, the closing days find orders coming into the operators at last. Retailers report that almost every order is urgent. This substantiates the contention that the cellars are practically empty and that the consumer would not buy until absolutely forced.

This week broken coal has been in strong demand and manufacturers who use this size are beginning to look to the future. Egg and stove are also in very fair demand and at good prices, while even chestnut shows indications of improvement. Of course this latter size is still quite low in price and the prospects are that it will not show any better figure so long as the circular price is so out of keeping with the other prepared sizes.

The steam sizes have very materially improved and seem to be in quite active demand as compared with last week. On special grades it has been impossible to fill the orders due partially to the fact that excessive flooding of the mines this summer resulted in a larger proportion than usual of the small sizes being used right at the colliery. The trade is also beginning to give more than passing attention to the suspension talk and have come to the conclusion that the demands of the miners are very liable to at least cause some unsettling of the business. For this reason a manufacturer here and there is putting a car or so of steam coal aside for an emergency.

While the prices on practically all sizes show a tendency to strengthen, that there is still cheap coal in the market, and it will take a month of real fall weather to eliminate it. Better prices are coming without a doubt, for even the individuals are now asking a higher figure for pea coal. At the present time $2 is the best price obtainable, although we note one instance where $2.25 has been obtained all summer for a special coal of this size.

The Western market for anthracite is now awake and has strengthened local conditions very materially.

That there is great faith in a good winter's business is demonstrated in a measure by the buildng of four large modern yards in the Germantown and Chestnut Hill section of the city. It has been many years since so much building activity has existed among coal dealers in one section of the city.

Quotations per gross ton, exclusive of the Pennsylvania state tax of 2½%, f.o.b. at mines and on vessels at the Port Richmond piers are:

	Line	Tide		Line	Tide
Broken	$3.50	$4.75	Pea	$2.50	$3.25
Egg	3.75	5.00	Buckwheat	1.25	2.25
Stove	4.00	5.00	Rice	.85	1.75
Chestnut	4.15	5.25	Barley	.50	1.50

Bituminous—Last week's gradual improvement continues, with the greatest demand being for the high volatile coals. The quiet recovery of the trade seems to be satisfactory to the shippers and the belief continues that we are on the verge of a good season and possibly an exceptional one. There has been some slight increase in prices and this gradual rise is expected to continue as the demand increases. Shippers are urging consumers to stock coal and in some instances their advice is being followed. No sales of large tonnage are reported, as operators are not inclined to commit themselves on large tonnages at prevailing prices, although tenders to this end are frequently made.

The prevailing prices for the week, per gross ton, are as follows:

Georges Creek Big Vein	$1.65@1.75	Fairmont gas, ¾	$1.20@1.30
South Fork Miller Vein	1.50@1.60	Fairmont gas, mine-run	1.05@1.15
Clearfield (ordinary)	1.10@1.20	Fairmont gas, slack	.70@ .80
Somerset (ordinary)	1.05@1.15	Fairmont lump, ordinary	.95@1.05
West Va. Freeport	.90@1.00	Fairmont mine-run	.85@ .90
		Fairmont slack	.60@ .70

BALTIMORE

Demand well sustained, car and labor shortage developing and prices slowly improving. Exports checked by lack of vessels.

Both labor and car supply grow more unsatisfactory and the price list is stiffening. Many mine interests are now complaining of a shortage of men. Operations are also restricted by the car shortage and orders are piling up. There is no longer any doubt that a decided stiffening to the market is under way.

The anthracite market is also improving. Nearly all dealers report an increasing demand now that cooler weather has set in. The demand so far centers largely on household sizes, and pea and nut coal are in especially good demand. An extremely busy fall is looked for as many householders who ordinarily have their supplies by this time failed to put in coal the past summer.

While there is now some little varience due to immediate necessities, prices per short ton to the trade at the mines and outside the Capes deliveries are:

	Mines	Balt.*	Fairmont	Mines	Balt.*
Geo. Crk. Big Vein	$1.75	$2.93	Ordinary mine run	$0.85	$2.28
Geo. Crk. Tyson	1.40	2.58	Ordinary ¾	.95	2.38
Clearfield	1.25	2.43@2.48	Ordinary slack	.65	2.08
South Fork	1.40	2.58	Low sulphur mine-run	1.10	2.53
Latrobe	.95	2.13	Low sulphur ¾	1.25	2.68
Somerset (best)	1.35	2.53	Low sulphur slack	.75	2.18
Somerset (good)	1.20	2.38			
Quemahoning	1.30	2.48@2.53			
Freeport	.85	2.03@2.08			
Miller Vein	1.10	2.28@2.33			

*F.O.B., outside Capes.

HAMPTON ROADS

Export shipments holding up well. Fair movement coastwise. Temporary accumulation at Tidewater.

Dumpings over the local piers have shown up well, especially to Italy and various South American countries, while the coastwise movement has been fair with cargoes to a large number of the New England ports and some shipments South.

The accumulation of coal on the railroad yards is perhaps somewhat in excess of normal and there may be some free coal. A number of the shippers, however, have a considerable quantity of vessel tonnage about due and with that now in port the beginning of the week will see a considerable reduction in the quantity now on hand. Prices are practically unchanged on the standard grades.

Railroad Tonnages—Dumpings over the local piers for the past five weeks compare as follows:

Railroad	Week Ending Aug. 28	Sept. 4	Sept. 11	Sept. 18	Sept. 27
Norfolk & Western	211,699	232,394	156,459	182,047	163,400
Chesapeake & Ohio	103,472	82,485	93,260	87,680	91,341
Virginian	82,131	72,302	70,855	59,597	79,176
Totals	397,302	387,182	320,574	329,336	333,917

Ocean Charters, Clearances and Freights

VESSEL CLEARANCES

The following steamers have cleared during the week Sept. 17 to Sept. 24:

NORFOLK

Vessel	Destination	Tons
Tasmania[1]	Spezia	4,432
Strathalbyn[1]	Dakar	6,666
Nordland[2]	Kingston	1,925
Capac[2]	Bahia Blanca	1,000
Achilles[3]	Cristobal	12,000
Genova[1]	Italian	5,261
Cleanthis[1]	Palermo	4,788
I. P. Justesen[4]	Buenos Aires	5,000
Luigi Ciampi[1]	Naples	5,000
Aldersgate[2]	Buenos Aires	5,050
Nina[5]	Maddalena	4,723
Selene[6]	Italy	5,050
Chipana[2]	Chilian	4,644
Doris[6]	Italy	5,293
Wegadesk[3]	Cristobal	6,500
Soerakrata[7]	Port Said	5,000
Bianchetto[1]	Genoa	2,469
Laertis[8]	Buenos Aires	6,039
Fert	Naples	7,900
F. Kreger	Lisbon	1,863
Jacksonville	St. Georges	961
Sverre	Valparaiso	5,353

NEWPORT NEWS

Vessel	Destination	Tons
Tottenham[9]	Port au Spain	4,600
Hermod[9]	Bridgetown	4,500
Caesar[10]	U. S. Government	3,200
Aspleyhall[9]	Naples	6,300
Veerhaven[11]	Montevideo	4,200
Strathspey[9]	Naples	3,800
Juan[9]	Cienfuegos	1,148
Birkhall[9]		6,300

PHILADELPHIA

Vessel	Destination	Tons
Moldegaard	Havana	1,788
R. Bohannon	Savannah	
Rio Blanco	Rio Janeiro	4,470
Northern	Marseilles	2,912
Annie Lord	Moncton, N. B.	450
S. H. Davidson	Bath	482
Modiva	Guantanamo	778

PHILADELPHIA—Continued

Vessel	Destination	Tons
Falk[9]	Cardenas	
Eagle Hill[12]	Bangor	
Tohickon[12]	Newburyport	
Ontelaunee[12]	E. Boston	
Lincoln[12]	Marbelhead	
Ashland[12]	Boston	
Logan[12]	Providence	
Yemassee	Providence	
F. W. Munn[13]	Providence	
Powell[13]	Providence	
Oley[12]	Searsport	
Macungie[12]	Portland	
Pickering[12]	Bar Harbor	
Cumru[12]	E. Boston	
Neshaminy[12]	Brookline	
Moselem[12]	Newburyport	
Paxtang[12]	E. Cambridge	
Tabor[12]	Portsmouth	
Moline[12]	Phillipsdale	
Tulpehocken[12]	Milton	
Franklin[12]	Neponset	
Buck Ridge[12]	Everett	
Glendower[12]	E. Cambridge	
Good Spring[12]	Portsmouth	
Cocalico[12]	Portland	

BALTIMORE

Vessel	Destination	Tons
Mar Cor	Italy	4,500
C. Accame	Italy	6,198
Falk	Cuba	2,685
Argyle	Italy	5,463
Mediterraneo	Russia	3,464
Chasehill	Italy	5,500

[1] Pocahontas Fuel Co. [2] Castner Curran & Bullitt. [3] W. C. Atwater & Co. [4] C. G. Blake Co. [5] New River Coal Co. [6] Flat Top Fuel Co. [7] Smokeless Fuel Co. [8] Barber & Co., Inc. [9] Berwind White. [10] Md. Coal & Coke Co. [11] C. & O. Coal Agency Co. [12] Phila. & Reading C. & I. Co. [13] Sterling Coal Co.

OCEAN FREIGHTS

The freight market is stronger than a week ago, and steamers are in demand for grain at higher figures than recently paid. It is rumored that three steamers have been chartered for coals to the West Coast of Italy at $11.04, and but few steamers are offering, as the owners prefer grain at rates now obtainable, but occasionally there are boats willing to accept coal at less than market rates.

We quote freight rates on coal by steamer as follows:

To	Rate	To	Rate
Havana	$2.50@2.75	Bermuda	$3.00
Cardenas or Sagua	2.75@3.00	Vera Cruz	3 50@3.75
Cienfuegos	3.00@3.50	Tampico	3 50@3.75
Port au Spain, Trinidad	3.75	Rio	8.28@8.40
St. Lucia	3.50@3.75	Santos	8.40@8.64
St. Thomas	3.25@3.50	Montevideo	8.16
Barbados	3.75	Buenos Aires or La Plata	8.16@8.28
Kingston	2 75@3.25	Rosario	8.40
Curacao	3.25	West Coast of Italy	11.04
Santiago	2 75@3.25	Barcelona	10.32
Guantanamo	2.75@3.25	Valparaiso or Callao	7.25@ 7.50
Demerara	5.00@5.50	Marseilles	10.56

* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British steamers; neutral steamers are more difficult to obtain and the rates are always higher.

W. W. Battie & Co.'s Coal Trade Freight Report.

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge. 24c. per net register ton per day demurrage."

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	To	Tons	Rate
F. Creadick	Cardenas	657	
Berlin	Havana	1,400	
Annie	Casilda	512	
W. H. Sumner	Cuba[1]	489	
F. M. Belding	Jacksonville	493	$1.05
A. B. Sherman	Charleston	510	1.10
Harry Morse	New Orleans		

[1] South Shore.

BALTIMORE

Vessel	To	Tons	Rate
Grekland	Malmo[1]	1,671	
Biemiller	Point-a-Pitre[2]	858	$3.75
F. Palmer	San Juan	1,726	
C. F. Cressy	Boston	2,089	
Unbe Mendi[3]	Italy	2,664	
Mar Cor	Genoa	2,059	10.08
C. Accame	Genoa	2,504	

BALTIMORE—Continued

Vessel	To	Tons	Rate
Falk	Havana	1,125	
P. Maersk	Malmo		$8.30
Gothard	Havana	1,790	
Panama	Chili	2,915	
Mediterraneo	Barcelona	1,657	
Jupiter[3]	Italy	3,217	10.08
Jean	Mayport	2,301	

[1] Gothenburg or Stockholm. [2] Option Phila. loading. [3] Or Virginia.

VIRGINIA

Vessel	To	Tons	Rate
Kankakee	River Plate	2,418	
Nairn	Suez	2,324	
Umbe Mendi[1]	Italy	2,664	
Jupiter[1]	Italy	3,217	10.08

[1] Or Baltimore.

LAKE MARKETS

PITTSBURGH

Definite car shortages appearing. Operations no heavier. Cooler weather. Lake shipments scarcely improved. Free coal steady with contract market a shade easier.

It is stated that not a single mine was able to operate on the Pan Handle division last Saturday, on account of there being no cars. While few of the mines have had orders sufficient to operate six days in the week the lack of cars proved a decided inconvenience. On nearly all divisions the supply is now scant and coal shippers attribute the scarcity to a decrease in the supply much more than to an increase in the coal shipments. Mining operations in the Pittsburgh district as a whole are at between 65 and 70% of capacity.

Cooler weather has given a slight impetus to the retail coal demand but the trade is still relatively quiet in this quarter. The iron and steel industry continues to consume a maximum supply of coal and is certain to be a very heavy consumer throughout the winter. The line demand generally is fair, while railroad consumption has increased. Lake shipments, while somewhat heavier than a month ago are still comparatively light and the rush in coal shipments expected for the closing period of the season is hardly likely to be experienced. The ore trade is now under such pressure that many boats are going up the Lakes light, in order to get in an extra ore cargo or two during the balance of the shipping season.

Prices for free coal retain their recently acquired firmness, but on contract to Apr. 1 the market is if anything a shade easier again, though not as low as a couple months ago. We quote for prompt shipment: Slack, 50@60c.; nut and slack, 90@95c.; nut, 95c.@$1; mine-run, $1.05; ¾-in., $1.15; 1¼-in., $1.25. On contract to Apr. 1: Slack, 85@95c.; mine-run, $1.15; ¾-in., $1.25; 1¼-in., $1.35, per net ton at mine, Pittsburgh district.

BUFFALO

No activity in anthracite and none expected till the weather is colder. Bituminous improves as the hot weather subsides. Prices quite strong. Fall trade promises to be good.

Bituminous—All reports agree that conditions grow steadily better. The demand is increasing and the car shortage is already making the consumer a trifle anxious and with the crops just beginning to move this may be increased soon. Certain mines that have been running four or five days a week are now preparing to go on full-time schedules. The Eastern demand is much better than it was, but there is no particular improvement in Canada.

Quotations on best grades, f.o.b. Buffalo, are:

	Pittsburgh	Allegheny Valley	Pennsylvania Smokeless
Lump	$2.65	$2.45	$2.55
Three-quarter	2.50	2.25	....
Mine-run	2.40	2.15	2.30
Slack	2.05	2.00	2.30

Quotations and freight rates to points east of Rochester, N. Y., and Kingston, Ont., are per long ton and balance of this territory is on the short-ton basis.

Anthracite—There is very little stir anywhere yet, though the trade feels that it must be near. It is the general opinion that there is less in consumers' hands now than has been the case in a long time and there is some eagerness to get started. There has been rather more coal sold by the independent companies than usual, but they have not failed to cut the circular price if necessary to do business. Concessions in this territory rule from 10 to 25c. off the circular, some being reported sold at April prices.

Quotations, f.o.b. cars at Buffalo, or in trestle to retailers, is $5.60 for lump, $5.85 for egg and stove, $6.10 for chestnut and $4.30 for pea, with 25c. additional for delivery on board vessel, all per gross ton of 2,240 lb.

TORONTO, CAN.

Industrial demand light and trade continues quiet.

Trade is quiet and featureless with ample supplies on hand. Manufacturing in nearly all lines continues inactive with little indication of any improvement for some time, though hopes are entertained that the good harvest may bring about a revival. Prices per short ton for best grades remain unchanged as follows: Retail, anthracite, egg, stove and nut, $7.75; grate, $7.50; pea, $6.50; bituminous, steam, $5.25; screenings, $4.25 to $4.50; domestic lump, $6; cannel, $8. Wholesale, bituminous, f.o.b. cars at destination, three-quarter lump, $3.56; screenings, $3.

COLUMBUS

Warmer weather makes the coal trade quiet, especially in domestic lines. Prices are still well maintained and the tone of the market is good.

There is a lull in the demand for domestic grades, due to warmer weather and retailers are holding up shipments, while orders are a little harder to book. But the tone of the trade is still good and future prospects are believed to be bright. The present relapse is regarded as only temporary.

Domestic business slowed up especially under the pressure of higher temperatures. Dealers are not placing orders so promptly, and some have even requested that shipments be held up. The better weather has permitted farmers to look after their fall work and they are not hauling coal at present. Prices are firm at the levels which have prevailed for the past few weeks. Considerable Hocking lump is now being stocked.

The Lake trade is rather slow although a considerable tonnage is going to the Northwest via the Lakes. At the Toledo docks of the Hocking Valley a total of 70,000 tons was loaded the week ending Sept. 24, but a large part of this came from West Virginia. Chartering is going on and there will be considerable activity from now until the close of navigation.

Prices in Ohio fields are as follows in short tons, f.o.b. mines:

	Hocking	Pomeroy	Eastern Ohio	Kanawha
Re-screened lump	$1.50	$1.60		
Inch and a quarter	1.40	1.45	$1.30	$1.30
Three-quarter inch	1.25	1.35		1.25
Nut	1.15	1.25		1.15
Mine-run	1.05	1.10	1.00	1.05
Nut, pea and slack	.65	.65	.50	.60
Coarse slack	.55	.55	.40	.50

Mines have been working at about the following percentages of full capacity:

	Week Ended					Week Ended			
District	Sept. 4	Sept. 11	Sept. 18	Sept. 25	District	Sept. 4	Sept. 11	Sept. 18	Sept. 25
Hocking	45	40	45	50	Cambridge	40	44	45	45
Jackson	20	25	25	25	Massillon	40	40	45	45
Pomeroy	50	50	60	75	Eastern O.	60	60	70	75
Crooksville	35	35	40	40	Average	41	42	47	50

CLEVELAND

Slack prices noticeably stronger. Coarse coals generally unchanged.

Fine-coal prices are five to fifteen cents higher than a week ago. The market is exclusively supplied with Ohio coals with the exception of a few cars of Pennsylvania. The high prices asked by the Pennsylvania and the West Virginia operators are keeping those coals out of the market.

Supplies are not large and receipts are below the average of the last six weeks. There is very little call for most coarse coals except the domestic sizes, which are being bought a little more liberally. The domestic trade is not very brisk, and fluctuates with the weather.

The Lake trade is slowly improving. Up to Sept. 1 the Duluth grain shipments are fast reaching the high point of the season and Lake Superior coal docks are shipping accordingly. The Canadian trade is taking considerably more coal than it did. The Lake business will be better from now on until the middle of November.

Jobbers are paying the following prices per net ton, f.o.b. Cleveland:

	Pocahontas	Youghiogheny	Fairmont	Bergholz	Ohio No. 8
Lump	$3.70				
Lump, 6-in.				$2.30	
Lump, 1¼-in.		$2.30		2.10	$2.15
Lump, ¾-in.		2.20	$2.00	2.00	1.95@2.00
Egg	3.70			1.95	
Mine run	2.80	2.10	1.90	1.85	1.85
Slack		1.80	1.85	1.65	1.65@1.70

DETROIT

Slow but regular gains in steam coal. Weather adverse for domestic sizes. Anthracite distribution slow. Shipments by Lake route are less.

Bituminous—While the present situation in Detroit cannot be considered as strong, there is enough activity in steam coal to indicate a definite improvement. Sales are showing a slight increase in volume. The number of inquiries and orders, from towns in Michigan, outside Detroit, indicates a better condition. This together with the gradually broadening local market is maintaining prices. The problem of dealing with speculative shipments dumped in the local market by various operators, still exists, though in less vexatious form than a month ago. Few of the coal consumers are accumulating reserve stocks, despite the warning from shippers that car shortage and weather condition may seriously interfere with deliveries later.

Anthracite—Retail dealers are not coming forward with orders as rapidly as shippers had expected. This is attributed to a belated buying on the part of the consumers. There was considerable activity in distribution early this month but buyers now seem less eager. A slowing down in the Lake movement of both anthracite and bituminous is forecasted for the remainder of the navigation season. Practically all freighters are in commission, the demand in the grain and ore carrying trades is so great that a number of owners are sending their vessels on upbound trips, without cargoes.

TOLEDO

Steam coal fairly steady but other grades are dull and heavy. Closing of Sunday Creek mines causes a better feeling in the market.

There is some change for the better, especially in steam coal. Pocahontas is more plentiful than it was but the call is light and prices are inclined to show some weakening. There is some little demand for Pittsburgh No. 8, which for a time was practically a dead issue. The Ohio mines are generally quiet but some of the Hocking Valley operators are fairly well supplied with orders. The closing of the Sunday Creek mines in that territory has made a better demand for some of the independent mines. Considerable coal is coming in to the local docks, and an increased volume from Hocking territory, but the Lake movement generally is light as compared with other seasons.

Following are the price quotations, f.o.b. mine, per short ton:

	Pocahontas	West Virginia	Hocking	Pomeroy	Jackson	Kentucky	Massillon No. 8
Lump.......	$2.25	$1.40 @ $1.85	$1.50	$1.65	$2.50	$1.75	$1.35
Egg.........	2.25	1.00 @ 1.25	.....	.....	2.50	1.25	1.20
Mine run....	1.40	.85 @ 1.00	1.10	1.10	.....	.90@$1.10	1.10
Nut.........	.....	.90 @ 1.15	1.25	1.25	.....	.90@ 1.15	.....
Nut, pea and slack......	.....	....	.65	.65	.60	.40@ .60	.60@ .75

CINCINNATI

Warm weather slows down the domestic demand materially. Steam coal remains weak and in slow demand. Car supply is not good.

While it is rather early in the season for a weather market to be reported, it remains a fact that the unexpectedly warm weather of the past week exerted a marked influence. Price concessions are still reported. The car supply is short apparently, but there are still enough cars to forward more coal than the market can readily absorb. Industrial activity is limited to the iron, steel and machinery trades, and these are not sufficient to create an active market for screenings and run-of-mine.

LOUISVILLE

Warm weather and heavy shipments cause a relapse. Some car shortage and outlook in this respect rather ominous.

The recent warm weather, combined with the accumulations due to the heavy shipments of the latter part of August and the first part of September have flattened the market. Shipments have outstripped the demand and the market is long both on domestic and steam sizes, especially the latter. In the western Kentucky field the steam coals are particularly slow; it is reported that one operator is trying to give away 30 cars of screenings for the freight and that he is offering to sell this grade on contract up to Apr. 1 at 15c. a ton, f.o.b. the mines.

Prices, f.o.b. the mines, have ranged during the past week on the following basis per long ton: Block, from $1.60 to $2.25; egg, $1.20 to $2.40; nut and slack, 20 to 40c. and 50 to 65c.

COKE

CONNELLSVILLE

Negotiations continue on furnace coke contracts for first half. Prompt coke a shade firmer. Production and shipments approximately stationary.

Claire furnace in the Shenango Valley will blow in about Oct. 1, on coke contracted for a few weeks ago. Otherwise there is no definite increase in merchant coke consumption in sight. Two or three consumers who were not covered for the year on contract have lately bought for the remainder of the year at $2 and $2.25, and the principal business before the market is now the first half of the new year. On this position there is considerable negotiation but buyers and sellers are not getting together rapidly. Sliding scales have been much discussed but there remains a possibility that a regular movement may start on a flat price basis, perhaps on a basis between $2.25 and $2.50. The lower figure has already been bid but turned down by makers of high-grade coke. Prompt furnace coke continues in very light demand, but offerings are also light and the market seems a shade firmer. We quote: Prompt furnace, $1.65@1.75; contract furnace to Dec. 31, $2@2.25; prompt foundry, $2.30@2.60; contract foundry, $2.40@2.60, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Sept. 18 at 382,467 tons, a decrease of 5,236 tons, and shipments at 390,290 tons, an increase of 1,428 tons.

Buffalo—The market grows stronger week by week, on account of the activity in the iron trade. The demand is everywhere good and the outlook is most encouraging. As the Lake season proceeds into its last quarter and ore movements sometimes slack off the call for tonnage increases. Prices are very firm on the basis of $4.30 for best 72-hr. Connellsville foundry, with $3.35 for stock coke.

Chicago—The coke situation from all points of view is in a better position now than it has been at any time in several years. The trend is still upward, and selling prices may soon be higher. The lively demand for steel products is resulting in heavily increased demand for furnace and foundry coke, while the retail trade for byproduct sizes has quickened. Gashouse demand is quiet. Quotations f.o.b. cars Chicago per net ton are as follows: Byproduct foundry, $4.90@5.10; byproduct domestic, $4.75; Connellsville, $4.85@5; Wise County, $4.75@5; gas coke, $3.85@4.

MIDDLE WESTERN

GENERAL REVIEW

Domestic buying brisk. Eastern coals easier. Car supply begins to tighten. Screenings weaker. Anthracite slow.

The weather became markedly cooler with frosts in some localities early this week, which has given renewed vigor to the market. Prices are generally steady although there are spots where they have been cut. Steam coals, particularly screenings, have shown weakness, declining as much as 40c. for the Southern Illinois product. Indiana screenings show more resistance. Car shortages are in evidence, and some Illinois mines have lost one or two days this week. Increased buying of domestic sizes 's in evidence and but little cheap coal is being offered. An increasing number of railroads are stocking up in order to take advantage of available equipment and to have the coal ready for any emergency.

Interior retailers have taken but little coal from the docks during the past week. Northwestern prices remain unchanged, but a goodly tonnage of Illinois coals has been moving toward that territory. Orders from dealers in Western states such as Iowa, Nebraska, Minnesota and the Dakotas are growing, and will show an increase from now on. They bought practically nothing last year, and have delayed purchases this year and the immense crops with good prices, assures an abnormal volume of orders. Contrary to the situation in other parts of the state, it is said that most of the retail dealers in northern Illinois are well stocked.

CHICAGO

Circulars more firmly maintained situation in Indiana notably firmer. Smokeless market mixed Kentucky and Hocking coals strong.. Anthracite slow opening up.

Franklin County operators are adhering strictly to the circular of $1.75 on lump, egg and No. 1 nut, while Williamson County shippers are averaging around $1.60 for these sizes. The over-production of steam coals in this section has caused a decline in screenings which have averaged 50c. per ton. Williamson County operations are behind orders, and are finding a very wide market for their coal. The higher priced steam sizes of Franklin County are heavy but Saline County screenings are stronger, and quite a tonnage has been sold here at from 60c. to 70c.

The situation in the Indiana field is much improved. Domestic demand has a better tone and quite a number of manufacturing plants will soon start operations again, which will insure a better call for steam coals. Some of the operators state that $1.70 to $1.75 will be a firm price on domestic lump from Nos. 6 and 4 mines during October. Third and Fifth Vein steam shipments have been of moderate volume while screenings have steadily brought from 60c. to 75c.

The smokeless situation is still a mixed one, and spot buying prices have been less than circular figures. On direct shipments from the mines the major producers are maintaining a price of $2.25 for genuine No. 3 vein lump and egg, but spot shipments of these grades have been sold as low as $1.85. The mine-run situation with the splint producers is in much better condition, although the splint demand generally is still quiescent. It is said the Lake movement is becoming heavier and generally more satisfactory.

Production at eastern Kentucky mines during the past several weeks has been heavier than during any previous year in the history of the state, and there is now a gradual improvement in prices and demand. Sporadic car shortages are already in evidence. Higher selling prices on all grades are confidently expected this month. L. & N. mines are reported sold up to capacity.

Very little anthracite coal has been ordered recently, due mainly to the mild weather. Indifference still rules among the dealers, and colder weather will be needed to put new life into the trade and induce stocking.

Quotations in the Chicago market are as follows:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump	$1.60@1.75	$1.50@1.65	$1.50@1.60	$1.35@1.50	$1.40@1.50
Steam lump	....	1.25@1.35	1.15@1.30	1.10@1.25	1.25@1.35
2½ and 3-in. lump	....	....	1.35@1.50	....	1.30@1.35
1¼-in. lump	....	....	1.25@1.30	1.15@1.25	....
Egg	1.60@1.75	1.45@1.60	1.10@1.20	1.10@1.20	1.15@1.25
Nut	....	1.50@1.65	.95@1.05	1.00@1.05	1.00@1.10
No. 1 washed	1.60@1.75	....	1.50@1.60	....	....
No. 2 washed	1.35@1.40	....	1.40	....	....
No. 1 nut	1.60@1.75	....	....	....	....
No. 2 nut	1.40@1.50		....	....	....
Mine-run	1.10@1.15	1.05@1.10	.85@.95	.95@1.10	.85@1.05
Screenings	.50@.65	.40@.55	.40@.60	.55@.65	.75@.80

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.50@1.75	$1.50@2.25	$2.25	$1.75@2.25	$1.50@1.60
1¼-in. lump	1.20@1.30	1.00@1.15	....	1.25	1.40
Egg	1.50@1.75	1.00@1.40	2.25	1.75@2.00	1.35@1.50
Nut	....	.90@1.15	....	1.25@1.40	....
No. 1 nut	1.50@1.75	....	....	....	....
No. 2 nut	1.40		...		....
Mine-run	1.15	.90@1.00	1.40	1.15@1.25	1.10@1.15
Screenings	.60@.70	.45@.80	....	....	....

ST. LOUIS

Franklin County mines forced to decline lump orders. Lump coals from inner group heavy. Dealers delay buying.

The demand for the higher grades of lump, from the outer group of mines, is stronger, due to the filling of the cellars and the laying in of stocks by dealers in anticipation of a still better domestic demand. This has caused weakness in the finer grades for steam use. Lump from the inner group, on the other hand, is a drug on the market because the warm September weather has enabled the less prosperous element to hold off laying in their winter's supply. The operators, in anticipation of the usual run of September orders, shipped in heavily at the first of the month and loaded the tracks. Screenings show some activity and the minimum is 35c.

The following are mine prices per net ton:

	Staunton	Collinsville	Sparta	Standard
6-in. lump	$1.35@1.50	$1.20@1.35	$1.15@1.25	$1.15@1.20
3 x 6 egg	1.15@1.30	1.10@1.25	1.00@1.10	.90@1.00
2-in. lump		1.15@1.20	1.10@1.20	.95@1.00
No. 1 nut	....	....	....	.75@.85
No. 2 nut	....	....	....	.60@.70
No. 1 washed	1.50	1.30@1.35	......	....
No. 2 washed	1.25@1.35	1.25	....	....
No. 3 washed	1.20	1.15	....	....
No. 4 washed	1.15	1.10	....	....
No. 5 washed	.70	.65@.70	....	....
Screenings	....	....	.40	.35@.40

DULUTH

Shipments of bituminous about normal. Anthracite movement lighter.

Shipments of bituminous coal are well up to the average for this season of the year, the demand from the elevators and the line companies operating throughout the Northwest being quite brisk. There is also a disposition on the part of the railways running out of the head of the lakes to increase their purchases. Shipments of all grades of coal for the month of August amounted to 18,075 cars, showing an increase over July of 5,220 cars, a healthy and a normal improvement. The total shipments made for the year ending Aug. 31 are 128,563 cars, as compared with 141,379 cars during the same period last year, or a decrease of 12,816 cars.

Quotations f.o.b. docks, per short ton, are as follows:

	Yough	Splint	Hocking	Smokeless	Elkhorn	Millers Creek
Lump	$3.40	$3.40	$3.40	$4.75	$3.75	$3.65
Dock-run	3.10	3.10	3.05	3.25	3.25	3.35
Stove or nut	3.40	3.40	3.40	4.75	3.65	3.65
Scgs	2.40	2.40	2.25	2.75	2.40	2.40

Very little business is being done in the anthracite trade, due to the very fine June-like weather. It being next to impossible to induce consumers in this section to stock up as long as it is not necessary to have a fire going. Dock companies quote f.o.b. cars their docks, per short ton as follows: Egg and stove $6.85, nut, $7.10, pea, $5.55; buckwheat, $4.

PRODUCTION AND TRANSPORTATION STATISTICS

VIRGINIAN RAILWAY

Shipments of coal over the Virginian Ry. for the month of July amounted to 381,853 net tons, as compared with 301,932 tons in June.

EXPORTS

Exports of domestic coal and coke from the United States, and bunker coal laden on vessels engaged in the foreign trade at the specified districts, during the month of July, 1915, were as follows:

Districts	Anthracite	Bituminous	Coke
Maine and New Hampshire	831	....	..
Maryland	85	258,585	12,072
Massachusetts	308	....	..
New York	29,197	3,021	1,636
Philadelphia	5,458	167,321	26
Porto Rico	......	75	......
Virginia	......	765,778	701
Florida	2	....	..
Mobile	......	558	.....
New Orleans	38	1,037	19
Arizona	2,570	1,929	3,094
El Paso	......	10,357	10,934
Laredo	......	1,363	32
San Francisco	......	31	13
Southern California	4	25	......
Washington	......	321	3,191
Buffalo	98,598	161,490	29,585
Dakota	......	1,984	123
Duluth & Superior	28	1,357	27
Michigan	95	32,257	5,537
Ohio	2,800	714,767	550
Rochester	68,442	82,871	681
St. Lawrence	64,060	21,038	1,535
Vermont	690	328	69
Total	273,206	2,226,493	69,825

BUNKER COAL

Districts	Gross Tons	Districts	Gross Tons
Maryland	53,113	Philadelphia	47,053
New York	289,202	Virginia	177,499

PENNSYLVANIA RAILROAD

The following is a statement of shipments over the P. R.R. Co.'s lines east of Pittsburgh and Erie for August of the current year and the eight months of 1914 and 1915, in short tons:

	August		Eight Months	
	1915	1914	1915	1914
Anthracite	743,257	795,492	6,819,744	7,036,663
Bituminous	3,847,575	4,074,810	27,777,498	29,814,540
Coke	1,135,645	789,363	7,225,908	6,846,389
Total	5,726,477	5,659,665	41,823,140	43,679,582

NORFOLK & WESTERN

Destination of shipments over this road for August of this year, the eight months of this year and last year were as follows, in short tons:

	August		Eight Months	
Coal	1914	1915	1914	1915
Tidewater, foreign	190,454	449,559	1,253,347	2,634,543
Tidewater, coastwise	328,279	292,244	2,570,213	2,180,164
Domestic	1,932,075	2,299,190	13,646,631	13,874,590
Coke				
Tidewater, foreign	......	1,771	197	18,459
Domestic	79,156	71,844	748,134	573,436
Total	2,529,964	3,114,608	18,218,522	19,281,192

FOREIGN MARKETS

GREAT BRITAIN

Sept. 10—Business is generally quiet for prompt positions, but there is prospect of a more active demand. Quotations are approximately as follow:

Best Welsh steam	Nominal	Best Monmouthshires	$5.52@5.76
Best seconds	Nominal	Seconds	5.04@5.28
Seconds	$5.52@5.76	Best Cardiff smalls	4.20@4.44
Best dry coals	5.52@5.76	Cargo smalls	2.64@2.88

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—Chartering is more active and with tonnage offering more freely, rates show some irregularity and are approximately as follow:

Gibraltar	$4.78	Naples	$6.96	St. Vincent	$4.32
Marseilles	6.47	Alexandria	7.20	Rio de Janeiro	5.28
Algiers	5.40	Port Said	7.20	Monte Video	5.04
Genoa	6.96	Las Palmas	4.08	Buenos Aires	5.28

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

Recast

In the following table we give a list of all old contracts coming up for consideration during the ensuing week. The table gives our contract number, the name of the purchaser, city, tonnage and page on which the detail notice appeared.

No.	Purchaser	City	State	Tonnage	Page
1321	Marshall County	Plymouth	Ind.	280b	530
1436	Emmons Bd. of Com'rs.	Linton	N. D.	70b	490
1458	Lincoln Bd. of Com'rs.	Davenport	Wash.	50	530
1460	La Moure Bd. of Com'rs.	La Moure	N. D.	100b	530
1463	City Government	Little Falls	Minn.	50b	530
1465	Court House	Selby	S. D.		530
1466	Court House	Bismark	N. D.	200b	531
1470	Benson Bd. of Com'rs.	Minnewaukan	N. D.	150b	531
1477	N. J. State Epileptics	Skillman	N. J.		531
1478	N. J. Home for Boys	Jamesburg	N. J.		531

a Indicates anthracite coal. b Indicates bituminous.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

+No. 866—Cleveland, Ohio—Bids on this contract (Vol. 7, p. 1085), which provides for furnishing the fuel requirements of the local Water-Works Department, will be received until Oct. 14 instead of Sept. 15 as was originally announced. It is rumored that the old contract will be renewed if the same price can be obtained. Address City Purchasing Agent, Water-Works Dept., Cleveland, Ohio.

1047—Kansas City, Mo.—It is understood that William Volker & Co. have reconsidered their intention of contracting (pp. 116, 489). The firm has not placed any orders since July, and are not in the market at the present time. Address Purchasing Agent, William Volker & Co., Main and Second Sts., Kansas City, Mo.

1080—Kansas City, Mo.—The packing firm of Morris & Co. announce that they have decided to confine their fuel purchases involving from 750 to 1,200 tons per week (p. 117), to the open market. Address Purchasing Agent, Morris & Co., Kansas City, Mo.

1107—Kansas City, Mo.—The fuel requirements of the Densmore Hotel, involving approximately 300 tons of slack (p. 157), will be bought in the open market instead of contracted for as previously noted. Address Purchasing Agent, Densmore Hotel, 912 Locust St., Kansas City, Mo.

1178—Cumberland, Md.—The requirements on this contract (p. 243), which provides for furnishing the local Board of Education with its coal requirements, are approximately as follows: Cumberland schools, 500 tons; Mt. Savage school, 40 tons; Eckhart school, 250 tons; Midland and Ocean schools, 75 tons; Lonaconing schools, 187 tons; Barton school, 75 tons; Westonport and Luke schools, 140 tons. Bids were received until Sept. 29 and only Georges Creek Big Vein coal will be considered. Address Sept. John E. Edwards, Bd. of School Coms., No. 7 Union St., Cumberland, Md.

1313—Boston, Mass.—It is understood that the Boston & Maine R.R. has decided not to accept any of the tenders made on this contract (p. 867). The present contract has a considerable time to run yet, and it is probable that nothing further will be heard in regard to this contract until at least next year. Address B. S. Hinckley, Boston & Maine R.R., Boston, Mass.

1404—New Orleans, La.—This contract (p. 448), which provides for furnishing the New Orleans Cotton Exchange with its winter supply of coal, will involve approximately 100 tons. Address Secy. H. G. Hester, New Orleans Cotton Exchange, New Orleans, La.

1444—New Orleans, La.—The contract for supplying the American Brewing Co. (p. 490), does not expire until the end of December instead of at the present time as previously announced. Address Ed. G. Schleider, American Brewing Co., New Orleans, La.

New Business

+1480—Massillon, Ohio—The Board of Educaion at this place received bids until noon, Sept. 29, for furnishing and delivering coal as may be required during the coming school year. Bids were requested on Goshen and Massillon mine-run, lump and slack. Address Clk. William Fielberth, Bd. of Edu., Massillon, Ohio.

+1481—Mandan, N. D.—The Board of Education will receive bids until 8 p.m., Oct. 4, for furnishing approximately 200 tons of screened, deep-mined lignite coal to be delivered at the various school houses. All bids must be accompanied by certified checks for $25. Address Clk. J. H. Noakes, Bd. of Edu., Mandan, N. D.

1482—Louisville, Ky.—The contract for furnishing the Columbia Building with from 100 to 125 tons of coal per month expires during the current month. Address Mgr. Columbia Bldg., Fourth and Main St., Louisville, Ky.

+1483—Annandale, Minn.—Bids will be received by School District No. 71 for furnishing and delivering two carloads of Pocahontas coal as may be required during the ensuing year. Address Clk. N. C. Smith, School Dist. No. 71, Annandale, Minn.

+1484—Sunbury, Penn.—The County Controller will receive bids until 11 a.m., Oct. 4, for furnishing and delivering 250 tons of anthracite pea coal to the local Court House; 125 tons are to be delivered at once and the balance as required. All bids must be accompanied by a certified check for $200. Address Controller Aaron Baker, Court House, Sunbury, Penn.

+1485—Rock Falls, Ill.—The Rock Falls Electric Light Plant usually contracts for its annual fuel supply, involving approximately 1,800 tons of mine-run coal, about Nov. 1. The business is done on a competitive basis, and the customary price is about $2.20 per ton. Address Supt. O. M. Aarvig, Rock Falls Electric Light Plant, Rock Falls, Ill.

+1486—Cooperstown, N. D.—The Griggs County Commissioners will receive bids on Oct. 4 for furnishing and delivering to the local Court House 40 tons of anthracite stove coal, 20 tons of Hocking Valley and 20 tons of Pocahontas. Address County Audr. H. S. Rearick, Cooperstown, N. D.

1487—Canton, Ohio—The Carnahan Tin Plate Co. usually contracts for its annual fuel requirements, involving approximately 24,000 tons of mine-run coal, about Nov. 1. Deliveries are required at the rate of two cars per day. Address Secy. and Treas. Roy Carnahan, Carnahan Tin Plate Co., Canton, Ohio.

+1488—Eau Claire, Wis.—The Board of Education at this place received bids until 5 p.m., Sept. 27, for furnishing and delivering approximately 500 tons of West Virginia splint, Kentucky block, Pocahontas smokeless or anthracite pea coal to the local school buildings. Address Secy. Emma Schroeder, Eau Claire, Wis.

+1489—Trenton, N. J.—Bids were received until 10 a.m., Sept. 30, for furnishing the coal requirements at the State Home for Girls as may be required during the period beginning Nov. 1 of this year and ending Apr. 30 of next year. Address Supt. (Mrs.) E. V. H. Mansell, New Jersey State Home for Girls, Trenton, N. J.

+1490—Leetonia, Ohio—The Board of Public Affairs will receive bids until 7 p.m., Oct. 5, for furnishing and delivering mine-run, screened, nut and slack coal to the pumping station of the local water-works as may be required during the ensuing year. Address Clk. Jacob Kuegle, Bd. of Pub. Affairs, Leetonia, Ohio.

1491—Louisville, Ky.—The contract for furnishing the fuel supply of the Bradford Mills, a branch of the American Wool Co., expires on Nov. 1. The present contract is held by the James Coal Co. and involves about one car of nut and slack coal per week. Quotations should be made f.o.b. the Germantown switch. Address Purchasing Agent, Bradford Mills, Dandridge and Reutlinger Ave., Louisville, Ky.

+1492—Vintondale, Penn.—The School Board at this place received bids until Sept. 30 for furnishing and delivering coal to the local school buildings as may be required during the ensuing year. Address Secy. George S. Blewett, Vintondale, Penn.

+1493—Jacksonville, Fla.—The City Government will receive bids until 8 p.m., Oct. 4, for furnishing and delivering approximately 150 tons of the best anthracite egg coal and about 85 tons of bituminous for use at the city buildings, fire and police stations. Address Pur. Agt. R. N. Ellis, City Hall, Jacksonville, Fla.

+1494—Grand Forks, N. D.—The City Government will receive bids until 4 p.m., Oct. 4, for furnishing coal approximately as follows: 2,000 tons of Youghiogheny screenings, 100 tons of anthracite chestnut, 200 tons of Youghiogheny or Hocking lump, 100 tons anthracite stove or egg. All proposals must be accompanied by a certified check for $200. Address City Audr. W. H. Alexander, Grand Forks, N. D.

+1495—Ashtabula, Ohio—The Ashtabula County Commissioners will receive bids until 1 p.m., Oct. 5, for furnishing lump coal for the county buildings at Kingsville and Jefferson during the year beginning Oct. 15. Quotations should be on the basis of a net ton f.o.b. cars at Kingsville and Jefferson. Address Clk. B. E. Brainard, Board of County Comrs., Ashtabula, Ohio.

+1496—Virginia, Minn.—The City Government received sealed bids until 8 p.m., Sept. 28, for furnishing and delivering approximately 100 tons of either Pocahontas or anthracite buckwheat, egg, nut or stove coal. Address City Clk. Albert E. Bickford, Virginia City, Minn.

1497—Cleveland, Ohio—The City Government will receive bids until noon, Oct. 6, for furnishing coal for the Department of Public Utilities, Division of Water. All bids must be submitted on blank forms that may be obtained on application. Address Comr. of Purchases and Supplies A. R. Callow, 511 City Hall, Cleveland, Ohio.

1498—Louisville, Ky.—The contract for furnishing the Fall City Brewery with its fuel requirements, involving three or four carloads of nut and slack coal per week, will expire on Nov. 1. Deliveries are made by rail. Address Purchasing Agent, Fall City Brewery, 29th and Broadway, Louisville, Ky.

1499—New Orleans, La.—The Presbyterian Hospital at this place will contract some time during the current month for its annual fuel supply, involving approximately 700 tons. Address Purchasing Committee, Presbyterian Hospital, 719 Carondelet St., New Orleans, La.

+1500—Punxsutawney, Penn.—The Board of Education at this place will receive bids until Oct. 11 for furnishing mine-run coal as may be required. Address Secy. W. A. Sutter, Punxsutawney Bd. of Edu., Punxsutawney, Penn.

1501—New Orleans, La.—The Crescent Bed Co. is considering bids for furnishing approximately 200 tons of mine-run coal, the purchase to be negotiated from the mines. Address Pur. Agt. Peter Jung, Jr., Crescent Bed Co., Gravier and Broad St., New Orleans, La.

1502—Bismarck, N. D.—The State Board of Regents will receive bids until 2 p.m., Oct. 13, for furnishing coal to the various state institutions during the period until June 30, 1916. The tonnages required are: North Dakota Agricultural Colleeg, Fargo, 2,700 tons; State School of Science, Wahpeton, 700 tons; State Normal and Industrial School, Ellendale, 600 tons; State School of Forestry, Bottineau, N. D., 100 tons. The best quality steam coal is required and quotations should be f.o.b. railroad switch at the institution or the most convenient point thereto as will be designated. Bidders are required to specify the mines from which they propose to furnish coal, and also to give analysis. The successful bidder will be required to furnish a surety bond of not less than $1 per ton of coal contracted for. Bids will also be received for range coal in car lots at each of the points noted. Address Secy. Charles Brewer, State Bd. of Regents, Bismack, N. D.

1503—Covington, Ind.—The Fountain County Commissioners will receive bids until 2 p.m., Oct. 5, for furnishing coal as follows: For the County Farm, 200 tons; Courthouse, 100 tons; County Jail, 60 tons. The coal is all to be 4-in. screened lump and that for the Courthouse and Jail is to be delivered in the bins as required, all deliveries to be completed by Jan. 1, 1916. Bids are also requested for furnishing coal to the County Asylum and quotations on this business should be f.o.b. cars at Nebeker's station. Address Audr. Hyman W. Newlin, Fountain County, Covington, Ind.

1504—New Orleans, La.—The contract of the Swiss Steam Laundry at this place, involving approximately 600 tons of steam coal per annum, will expire on Nov. 1. Address Pres. L. P. Hakenjos, Swiss Steam Laundry, 1010 Gravier St., New Orleans, La.

+1505—Gilbert, Minn.—Bids were received until Sept. 27 for furnishing School District No. 18 with approximately 600 tons of Pocahontas mine-run and 200 tons of anthracite stove coal. Address Clerk, School Dist. No. 18, Gilbert, Minn.

+1506—Trenton, N. J.—Bids will be received by the New Jersey State Prison until 1 p.m., Oct. 13, for furnishing coal as required during the period from Nov. 1 of the current year to Mar. 31 of next year, at the following places: State Prison at Trenton, N. J.; State Road Camp No. 1 at Springfield, N. J.; State Road Camp No. 2 at Rocky Hill, N. J.; State Road Camp No. 3 at Elmer, N. J. All bids must be accompanied by a certified check. Address Fiscal Agt. J. P. McCormack, State Prison, Trenton, N. J.

1507—New Orleans, La.—The Dixie Laundry Co. of this place is requesting bids for furnishing its annual fuel requirements, involving approximately 100 tons of steam coal. Address Secy.-Treas. Max N. Kohler, Dixie Laundry Co., 1124 Tulane Ave., New Orleans, La.

+1508—Kansas City, Kan.—The City Government received bids until 9 a.m., Sept. 28, for furnishing approximately 400 tons of Cherokee lump coal. Address City Clerk, Kansas City, Kan.

1509—White Rock, S. D.—The County Commissioners will receive bids until noon, Oct. 5, for furnishing and delivering to the Court House 100 tons of Zenith screened steam coal, and also for furnishing, f.o.b. cars, 15 tons of anthracite coal for the county farm. Address County Audr. O. F. Lien, Bd. of County Comrs., White Rock, S. D.

1510—New Orleans, La.—The Louisiana Distilling Co. will receive bids for its fuel requirements at any time. Address Manager, Louisiana Distilling Co., 865 S. Peters St., New Orleans, La.

1511—Bedford, Ind.—The Lawrence County Commissioners will receive bids until Oct. 4 for furnishing and delivering approximately 100 tons of Black Creek coal to the poor farm. Address Audr. E. W. Edwards, County Comrs., Bedford, Ind.

1512—Portage, Penn.—The School Board at this place will receive bids until Oct. 2 for furnishing and delivering either Miller vein or C Prime vein coal as may be required during the coming school year. Address Secy. H. D. Border, School Bd., Portage, Penn.

1513—Virginia, Minn.—The Board of Education received bids until Sept. 27 for furnishing 1,000 tons of Youghiogheny screenings, 500 tons of buckwheat and 100 tons of stove coal. Address Secretary, Bd. of Edu., Virginia, Minn.

1514—New Orleans, La.—The Central Laundry Co. at this place consumes approximately 600 tons of coal per annum and is willing to consider making a contract. Address Purchasing Agent, Central Laundry Co., 1100 South Liberty St., New Orleans, La.

+1515—Saratoga Springs, N. Y.—The Commissioner of Accounts received bids until 3 p.m., Sept. 27, for furnishing approximately 200 tons of grate or egg coal, to be delivered at the City Hall. About 100 tons are to be delivered at once and the balance as required. Address Comr. of Accounts Michael J. Mulqueen, City Hall, Saratoga Springs, N. Y.

+1516—Philadelphia, Penn.—The Department of Supplies will receive bids until noon, Oct. 5, for furnishing coal on a deficiency contract until the end of the year, as follows: Queen Lane Pumping Station, 3,400 tons of anthracite buckwheat; Roxborough Auxiliary Pumping Station, 500 tons of anthracite buckwheat; Lardner's Point, 6,400 tons of bituminous; ice boats, 1,000 tons of bituminous. Address Dir. Herman Loeb, Dept. of Supplies, City Hall, Philadelphia, Penn.

1517—Sioux Falls, S. D.—Bids will be received until 2 p.m., Oct. 6 for furnishing and delivering 250 tons of bituminous and 50 tons of anthracite coal. Address Audr. H. H. Howe, Minneapolis County, Sioux Falls, S. D.

+1518—Minot, N. D.—Sealed bids will be received until 8 p.m., Oct. 4, for furnishing screened lignite lump coal to the Public Library. Address Secy. (Mrs.) A. L. Carr, Minot, N. D.

+1519—Hopkins, Minn.—Bids will be received by Hennepin County, until 11 a.m., Oct. 4, for furnishing 100 tons of Youghiogheny screened lump coal f.o.b. switch at Hennepin County farm. Address Audr., Hennepin County, Minneapolis, Minn.

1520—Akron, Ohio—Bids will be received until 11 a.m., Oct. 7, for furnishing Summit County with coal during the ensuing year. The coal is for use at the Court House, Jail and County Infirmary and quotations should be made f.o.b. Erie tracks at Court House and Northern Ohio tracks at Fairlawn. Address Clk. U. G. High, Summit County, Akron, Ohio.

1521—Ottawa, Ill.—Bids were received until 2 p.m., Oct. 1, for furnishing La Salle County with its coal requirements during the ensuing year. The successful bidder must furnish a bond for $2,000. Address Chm. E. P. Nitschelm, Ottawa, Ill.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

No. 205—Norristown, Penn.—This contract (Vol. 7, pp. 400, 626, Vol. 8, p. 42), which provides for furnishing the local School Board with anthracite and bituminous coal, previous announcement of the anthracite award having already been made and the bituminous portion has also now been awarded to the **Knickerbocker Coal Co.,** of Philadelphia, at $3.15 per ton for 350 tons of coal delivered. Address Secy. Harry W. Akins, 717 DeKalb St., Norristown, Penn.

1044—Kansas City, Mo.—This contract (pp. 116, 446), which provides for furnishing the fuel requirements of the Sewell Paint and Glass Co., has been awarded to the **Mayer Coal Co.** on deep shaft nut coal. Address Purchasing Agent, Sewell Paint and Glass Co., Kansas City, Mo.

1066—Kansas City, Mo.—This contract (pp. 116, 489), which provides for furnishing the Gillpatrick Laundry Co. with about 100 cars slack coal per month, has been awarded to the **Beatty Coal Co.** on Paris slack at $3.75 per ton. There were no other bidders on this business. Address Purchasing Agent, Gillpatrick Laundry Co., Vine and 15th St., Kansas City, Mo.

+1157—Brookings, S. D.—This contract (p. 199), which provides for furnishing the city government with approximately 20,000 tons of coal, has been awarded to the **Brookings Lumber and Fuel Co.** at $4.60 per ton, delivered in the bins. Address County Audr. G. H. Stoddard, Brookings, S. D.

+1180—Columbia, Mo.—This contract (pp. 244, 446), which provides for furnishing the local Water and Light Department with approximately 8,000 tons of Nos. 3, 4 and 5 washed slack coal has been awarded to **Whittle & Hockaday** at $2.31 per ton. Address Clk. John S. Bicknell, Columbia, Mo.

1192—New Brunswick, N. J.—This contract (pp. 244, 489), which provides for furnishing the city pumping station with approximately 900 tons of bituminous coal to be delivered at Weston's Mills at the rate of 100 tons per month, has been awarded to **Daniel June** at $4 per ton. Address City Clk. E. J. McLaughlin, Dept. of Pub. Affairs, New Brunswick, N. J.

1224—Boston, Mass.—This contract (p. 245), which provides for furnishing the Massachusetts Training School with coal, has been awarded to the **Spring Coal Co.** on the following basis, quotations including cost of delivery at the schools: Lyman School for Boys at Westboro, 800 to 1,500 tons, at $4.13; Shirley Industrial School for Boys, 300 tons at $4.38; Lancaster Industrial School for Girls, 300 to 400 tons at $4.48. Address Executive Secy. F. Leslie Hayford, Massachusetts Training Schools, 274 Boylston St., Boston, Mass.

1251—Redfield, Iowa—This contract (p. 284), which provides for furnishing the Independent School District with approximately 100 tons of coal, has been awarded to **G. W. Armfield,** at $3.75 per ton for 6-in. screened coal. Patty & Bailey bid the same, and the Redfield Brick & Tile Co. bid $4 per ton. Address Clk. R. V. Seaman, Independent School Dist., Redfield, Iowa.

+1252—Minot, N. D.—This contract (pp. 284, 489), has been awarded as follows: **J. S. Wallace,** School No. 1, $3.85; **Oscar Simmonson,** School No. 2, $3.45; School No. 3, $3.20; School No. 4, $4. Address Clk. W. E. Gross, School Dist. No. 7, Minot, N. D.

1265—Hazleton, Penn.—This contract (p. 324), which provides for furnishing the local Board of Education with approximately 1,500 tons of pea and stove coal, has been awarded to the **Lehigh Valley Coal Co.,** at $2.75 for pea and $3.75 for stove, the hauling to be done at 32c. per ton. Other bids on this contract were too high as transportation to a convenient siding in Hazelton makes the cost excessive. Address Secy. D. T. Evans, Hazelton School Dist., Hazelton, Penn.

1272—West Point, Neb.—This contract (p. 324), which provides for furnishing and delivering 150 tons of coal for School District No. 1 at this place, has been awarded to **Weller Bros.,** at $4.85 per ton. Address Secy. J. C. Hansen, School Dist. No. 1, West Point, Neb.

+1299—Columbus, Ohio—This contract (p. 325), has been awarded to the **New York Coal Co.** at $1.25 per ton; this applies to that portion of the contract providing for furnishing 12.000 tons of nut, pea and slack coal to the Ohio Penitentiary at Columbus. Other bids on this business were: Elk Coal Co., $1.30; Ajax Block Coal Co., $1.33; the Seidenfeld-Hammon Coal Co., $1.35; the Jno. M. Taylor Coal Co., $1.25, and the Wm. J. Hamilton Coal and Coke Co., $1.25. The bids for the Cleveland State Hospital and the Columbus State Hospital, each involving approximately 10,000 tons, have also been received. Address Pur. Agt. R. V. Lyon, Ohio Bd. of Administration, Columbus, Ohio.

1337—Wilmington, Del.—This contract (p. 410), which provides for furnishing the Government Engineers with approximately 3,000 tons of bituminous coal, has been awarded to **Chas. Warner Co.,** of Wilmington. Address United States Engineer's Office, Old Federal Bldg., Wilmington, Del.

+1354—Buffalo, N. Y.—This contract (p. 411), which provides for furnishing the Buffalo State Hospital for the Insane with a six months' supply of coal estimated at from 12,000 to 16,000 tons, has been awarded to the **Frick Coal & Coke Co.** at $2.18 per short ton for slack coal f.o.b. the hospital. Address Purchasing Committee, State Hospital, Room 138, Capitol, Albany, N. Y.

+1370—Newark, N. J.—This contract (p. 446), which provides for furnishing the State Board of Education with approximately 250 tons of pea coal for the Normal School, has been awarded to the **S. Smith Coal Co.,** of Kearney, N. J., at $4.24 per gross ton. Paul Bros., of Newark, N. J., bid $4.40 per ton. Address Pres. Joseph S. Frelinghuysen, Dept. of Pub. Instruction, State House, Trenton, N. J.

+1409—Philadelphia, Penn.—This contract (p. 448), which provides for furnishing the Philadelphia County Prison with approximately 600 tons of white ash buckwheat coal to be delivered during October, November and December, has been awarded to the **Philadelphia & Reading Coal & Iron Co.** Address Philadelphia County Prison, 10th and Reed St., Philadelphia, Penn.

Contract Notes

Lucca, N. D.—The contract for supplying the local schools with coal has been awarded to the **Farmers Elevator Co.**

Neosha, Kan.—The contract for furnishing the local Board of Education with coal has been awarded to **P. Ratliff** at $3.60 per ton for Cherokee lump.

Conshohocken, Penn.—A contract for furnishing the local School Board with approximately 200 tons of pea coal has been awarded to **James Tracy & Son** at $4.30 per ton, delivered. Address Secretary, Bd. of Edu., Conshohocken, Penn.

Grosse Pointe, Mich.—The contract for furnishing the local schools with approximately 200 tons of egg and stove anthracite was awarded to **J. & T. Hurley,** of Detroit, at $6.95 per ton. Address Secy. Robert Trombly, Bd. of Edu., Grosse Pointe Village, Mich.

Coshocton, Ohio—The board of control has awarded the contract for the city water-works to **Edgar W. Frock,** on mine-run coal at $1.62½, delivered at the pumping station. The contracts calls for approximately 36 tons a week or 2,000 for the year.

Concordville, Penn.—The P. E. Sharpless Co., butter manufacturers, have entered into a contract for 4,000 tons of bituminous coal to be furnished by the Emmons Coal Mining Co., Philadelphia. Address Purchasing Agent P. E. Sharpless Co., Concordville, Penn.

Omaha, Neb.—The Municipal Water Plant at this place consumes about 50 tons of coal per day, which is bought as required and stored in a large coal pit. The Water Board does not call for competitive bids. Address Purchasing Agent, Water Board, City Hall, Omaha, Neb.

Cando, N. D.—The contract for furnishing the County Government with 150 tons of Hocking Valley coal has been awarded to the **Monarch Elevator Co.** at $6.13 per ton f.o.b. Cando. The contract for furnishing lignite coal was awarded to the **Pipe-Howe Lumber Co.** at $3.20. Address County Audr. F. F. Vaughan, Cando, N. D.

Hampton Roads, Va.—The contract for coaling the interned German cruiser "Kronprinz Wilhelm" (p. 412) provides for furnishing 992 tons of the best Pocahontas coal. The consideration is $2.99 per ton, delivered in lighters alongside and to be taken on board by the ship's crew. Address Paymaster Hassan, steamer "Kronprinz Wilhelm," Hampton Roads, Va.

St. Peter, Minn.—The County Commissioners at this place have awarded contracts as follows: **Nicollet Farmers' Exchange,** for furnishing the poor farm, $5.35 per ton, f.o.b. Nicollet, for screened splint; **Jensen & Lampert** for furnishing the Court House, $5.65 per ton for West Virginia splint screened lump; **Atlas Elevator Co.,** for furnishing the jail, $7 per ton for dock screened Pocahontas smokeless lump.

Norristown, Penn.—The State Hospital for Insane has closed a contract for 10,000 tons of bituminous coal with the **Irvona Coal & Coke Co.,** of Philadelphia, for the period ending Aug. 1, 1916. This institution formerly used anthracite pea and buckwheat, contracting for a supply every three months. After experimenting with bituminous coal for a year they have decided to continue its use. Address Steward Oscar L. Schwartz, Morristown, Penn.

COAL AGE

Vol. 8 NEW YORK, OCTOBER 9, 1915 No. 15

The Two Brothers

We are responsible for much of the progress of the world.

We it is who have made possible the finding of a North Pole, the digging of a Panama Canal, the wresting of electricity from nature, the invention of a telephone.

We have raised up a peasant and set him on the throne of a kingdom.

We make the difference between the slave groping in the mud and the sage who knows the planets intimately.

We pour out our gifts to all those who seek us.

Among our votaries are the old and the young, the rich and the poor, the great and the humble. And to all we give some of our gifts; to some we give all.

Those who labor in the dark caverns of the earth owe us a great debt.

We have sent our followers to carry the sustaining air to the innermost recesses of the mines; to fill the passages with a light as bright as day; to drive out the poisonous vapors and gases that lurk in secret places to destroy the lives of those who labor; to drain the waters from the mines or to convert them into spray to control the treacherous dust.

We have other and personal blessings to bestow. In our gift is gold—the evidence of success. We offer position and power.

We make happy homes that are greater than banks or battleships.

We give strong bodies and clear brains to make the earth an abode of happiness and peace.

We build up righteous communities. We overcome discontent. We banish disease.

We put our followers on a level with all men. We sharpen the sympathies that they may understand the humble. We quicken the intellects that they may take their proper place in the counsels of the great.

We promote health, happiness, faith.

We are brothers—we are called Education and Industry.

By GEO. N. LANTZ, *New Straitsville, Ohio*

Motor Haulage and Side Tracks--I

By George S. Brackett*

SYNOPSIS—In planning a new mine or extending an old one, the coal-haulage system requires careful consideration. This is the first of two articles on this subject. The treatment is not detailed, but rather a general view of the entire problem and a protest against the haphazard, hit-or-miss methods often employed in laying out a mine transportation system.

In planning the development of a mine, the initial consideration is the location of the opening and the laying out of the headings or roads by which the coal must be transported from the working face to the tipple. The next essential is provision for circulating air, which demands that there must be at least two headings. Subordinate to this, but nevertheless important, is the prospective projection of the headings throughout the entire coal area in order that they may reach and exhaust all the sections, points, knobs and windgaps. From the main face heading are broken the main butt headings. These in turn produce face headings and butt room headings, dividing the property into panels or batteries of rooms. It is here in the design of the development that the matter of motor haulage should be considered.

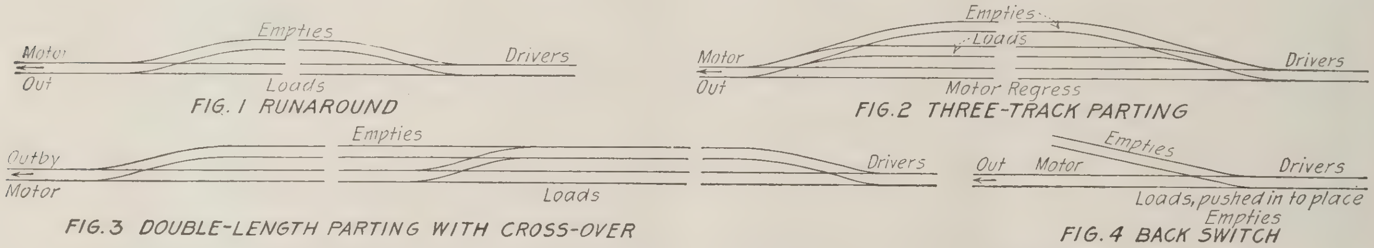


FIG. 1 RUNAROUND

FIG. 2 THREE-TRACK PARTING

FIG. 3 DOUBLE-LENGTH PARTING WITH CROSS-OVER

FIG. 4 BACK SWITCH

FIGS. 1 TO 4. FOUR FUNDAMENTAL SIDE-TRACK ARRANGEMENTS

Much has been published on the question of motor haulage—the track, trolley, hangers, speed, capacity and cost of operation; but the question of the practical design of the general system to conform with different mine workings and the nature and location of the passings and junctions has been scarcely touched.

This article is not a detailed account of motor construction, weights, effective grades, curve and switch limits, but rather a view of the question in its entirety—where the motor should go, the kinds and number of junctions and side tracks advisable and their location. It is a protest against the common method of installing motor haulage without initial consideration and only through necessity when the animal haul becomes prohibitive on account of the distance traversed. In such an instance the motor is installed with its single terminal at a convenient place outside of the first working heading, or if a few of the first headings are on the decline in production, they are abandoned and passed by the main motor haulage, to be exhausted only as the final working retreats toward the mine mouth. It is difficult to place a single terminal side track so that the driver's haul from it to the working faces will be economical throughout.

The major portion of transportation expense is not consumed by the main haulage motor, but rather by the gathering of the coal from the working face to the side track or tracks. Evidently then it is this gathering to which most attention should be given. The actual straight motor haulage must be secondary to the gathering proposition, and if convenient should accordingly be sacrificed to the more expensive operation so as to reduce the gathering expense. The primary object of the main motor haul is to render the gathering more economical. When it fails in this it has fallen short of its most important duty.

Like the system of ventilation, the system of haulage to be adopted strongly influences the planning of the mine workings and headings. In developing any mine of considerable tonnage, the method to be adopted in the motor-line extension should be kept well in mind when the workings are being laid out. The entire property must be considered in this connection. There is little excuse for not having the mine workings provide for the extension of the motor haul the same as they do for the ventilation, so that actual moving of the side tracks forward to keep pace with the advancing workings is not the momentous question which it usually is. The headings, cross-headings and cross-cuts should be laid out so as to conform with the side-track and haulage plan and should be kept clean where the parting tracks are needed.

When gathering is done by motor the necessity for keeping the side tracks advancing is not as important as where animals are used. The economy of gathering by motor is more evident as the distance from the working face to the straight-haul junction increases. Where the motor has the advantage over horses and mules is when it collects 15 or 20 loads and speeds off to the side track 2,000 or 3,000 ft. away. Correspondingly its inefficiency is manifest when it makes a long trip for one or two loads or where the main junction is so close that most of its time is spent in actual gathering to the room necks.

The point of principal importance in laying out motor side tracks is the junction with the horse or mule haulage, and a full understanding of this difficult part of the question requires little other information to adapt it to the junction of express and gathering motors. Most mines do their gathering with animals, while motor gathering is in the minority.

For convenience in description, it is assumed that the main heading is a face heading from which butt or room headings are broken every 300 or 400 ft. The arrangement of the side tracks at the junction points of these headings covers the question completely, as the conditions there existing are identical with the junction points of the main butt and face headings. The problem is accordingly confined to the face main and its butt or room headings.

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*Flemington, W. Va.

Following the undisputed hypothesis that the motor road must be kept close up to the driver's haul in order to keep the cost of the latter down to its most economic point, the necessity of numerous side tracks is evident.

In some mines there may be certain deficiencies of equipment which prevent this. A single motor may not be able to work all the side tracks that are advisable or there may not be enough mine cars to feed the required number of partings; for the more terminals there are, the more mine cars are needed. These local conditions may prevent temporarily the adoption of the main motor haul which would give the most economical gathering, yet it does not alter the fact that there is a most economical way of handling the coal, and an examination of the cost will show that the additional equipment would be a paying investment.

If one main-haul motor will not feed all the partings that are advisable, there should be two, and if there are not enough mine cars there should be more. There are two ways of looking at every question—what is actually the best way and the cheapest way of moving the coal (this should receive much attention in a mine layout) and what is the best and cheapest way this can be done with the equipment on hand. If additional equipment is not obtainable, it is usually a question of arranging a straight haulage so that there is as little time lost as possible at the terminal, keeping the number of side tracks down with a view to getting them as close to as many workings as possible. This merely approaches the most economic condition and is the best that can be done under the circumstances. The most economic design is one that does not permit any driver to have a haul greater than may be operated efficiently or that allows any motor to take a long journey for less than a full trip. When this exists coal haulage is being done economically.

A mistake frequently made in examining mining costs is a failure to look at the question in proper integral parts. The main haulage is one distinct part and the gathering of the coal another. Each should be handled on the most economical system irrespective of the other. On a properly arranged main or express haulage there is little difference in the transportation cost for a thousand feet or for a mile. The latter haulage is equipped with heavy motors and good track and operates heavy trips. The former worries along with a light motor and usually poorly surfaced track.

There is, however, a vast difference in the economy of mule-gathering over short and long hauls. As the mine workings advance there are constantly changing conditions, and the corresponding readjustment of the haulage to the end that all the integral parts of the system may work at their most economic speed and so that the most frequent delays should affect the fewest possible men. It is no economy to have an hour's delay under the tipple stop the entire mine, motor and drivers for the same period. With properly arranged side tracks, a reasonable surplus of power and empty mine cars and track accommodations for them, there is no reason why the mine should not continue to operate for a reasonable time, holding the loads on the side tracks and tipple tracks until the dumping starts again. The tipple and main haulage should accordingly be sufficient to recover in a short time from the congestion caused by the delay. In other words, in order to keep the greater expense (the gatherers) working steadily, there must be some surplus capacity in the main haulage and tipple. This is an economic arrangement.

The ability of the mine management to meet all the requirements of a motor haul—or all that it is practical to meet—depends on a full and complete knowledge of all the kinks used in motor haulage and side tracks. With this in view I have collected illustrations of all the side tracks that I could in order to embody them for reference.

Figs. 1, 2, 3 and 4 give four fundamental side-track arrangements from which all side tracks or terminals may be constructed or evolved. One of the tracks may be in the main heading and another in a back heading, or part in the main and part in the cross-heading. There may be a combination of some of these forms used to make up the completed partings, but these four are the foundation of all side tracks.

With reference to their use, side tracks may be classed under three different heads with two subdivisions each. These are, 1, junctions of animals and motors—(a) terminal, (b) intra-terminal to feed a heading along a continuous motor road; 2, junction of main and gathering motors—(a) terminal, (b) intra-terminal; 3, for two or more main haulage motors—(a) passing, (b) meeting.

Figs. 5, 6 and 7 illustrate the changes necessary to adapt standard partings for intra-terminal work.

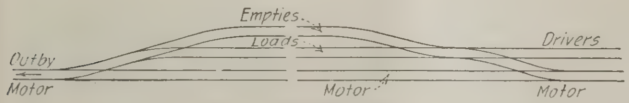

FIG. 5 RUNAROUND

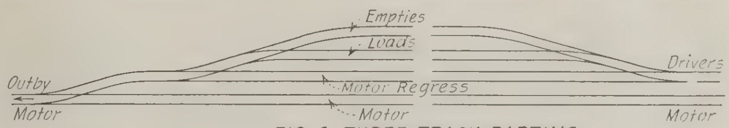

FIG. 6 THREE-TRACK PARTING

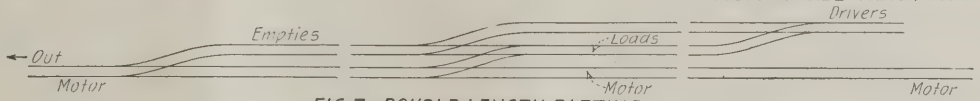

FIG. 7 DOUBLE-LENGTH PARTING

FIGS. 5 TO 7. ADAPTATIONS OF STANDARD PARTINGS TO INTRA-TERMINAL WORK

JUNCTION OF ANIMALS AND MOTORS

We may consider first the simplest form of motor haulage; namely, one motor, one straight track and one terminal side track inside the mine, beyond which lie all the producing sections. The difficulty in the permanent adoption and maintenance of this form is that the forward workings are calling for a closer side track before the complete exhaustion of the older sections will permit an advance. The result is that some workings are often abandoned before they are exhausted, in order to move the parting up to and get it closer to the advancing portion of the mine.

These older sections have passed the prime of their production and are expensive to operate, while the long animal haul from the more favorable section renders their operation expensive. This results in a high operating cost. Had this original terminal side track been first constructed with a view of extending the motor road to pass it as soon as necessary in such a form that it could have been left in position without interfering with the extension beyond, the rear section could have been completely exhausted without delaying the extension of the motor road until the forward driver's haul became extreme and the cost of gathering rose to a prohibitive point.

The main issue, which must not be obscured, is that the motor haul is the means by which the animal gathering may be done economically. The design of the haul should therefore be such that this is accomplished in its maximum. It should reach every section of the mine within a reasonable distance or driver's haul from the point of production. Although this may require additional motor power, it is nevertheless provident. It is not simply a single track with a single terminal placed at such a point as to "strike a happy medium" in accommodating all the workings. It is a series of branches with terminal and intra-terminal partings, each placed so as to give the greatest efficiency in the gathering of the coal from each and every heading or section of the mine until these sections are exhausted.

A side track that serves the purpose of a terminal for the motor haul and at the same time supplies that particular heading at its head when the motor haul is extended to feed the advancing workings without change or alteration is a practical impossibility. This change, however, from a terminal to an intra-terminal side track should be, for the sake of economy, as small as possible and made with the least possible expense. It is an important point in laying out the motor haulage and its side tracks to have in mind all the time the questions, Where will the next parting be? and, Have provisions been made to pass on beyond this in the most economical way?

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Great Lignite Resources of North Dakota

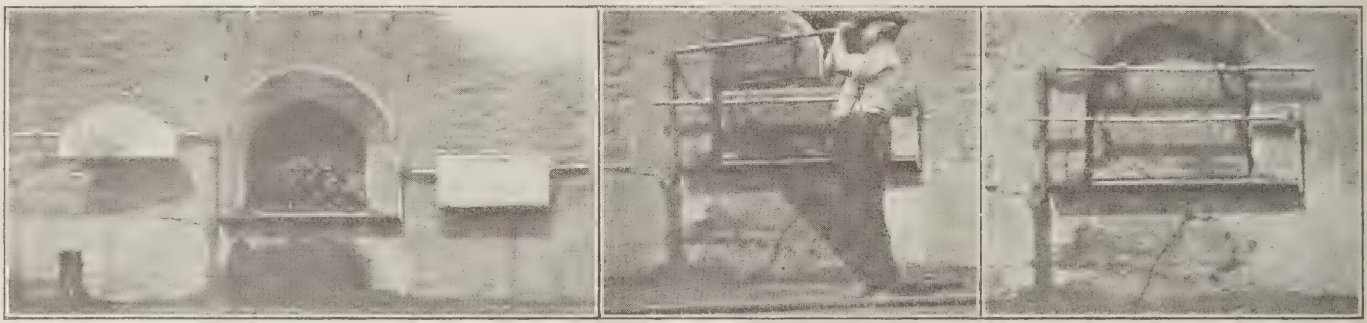
Lignite underlies almost all the western part of North Dakota. It is estimated by the United States Geological Survey that the state contains the enormous amount of 697,000,000,000 short tons of lignite in beds over 3 ft. thick and within 1,000 ft. of the surface, and it seems probable that there is workable lignite within this limit under every section of the land in the western part of the state. It is difficult to form an idea of a mass containing even 1,000,000 tons, and hence the figures given above are practically impossible of comprehension; but if the amount is put in the form of a cube, a better conception of its magnitude may be obtained. The lignite of the state, if formed into one mass in the compact form in which it lies in the ground, would make a cube 5 mi. long, 5 mi. broad and 5 mi. high. Such a cube would cover nearly a township of land and would be almost as high as the highest mountain on the globe.

Much of the lignite, although of poor quality and at present used only in a small way, constitutes a vast fuel resource which will in time become of great value, not only to the individual citizens of the state but to the corporations that are seeking power for use in manufacturing or in transportation.—*Northern Pacific Guidebook,* Geological Survey.

⁂

New Beehive Coke-Oven Door

The use of permanent doors for beehive coke ovens has recently made important advances, mainly because of the economies thereby effected. It is evident that there is a demand for this improvement or there would not be so many types on the market, nor would engineers and practical mining men show such activity in designing new doors. P. J. Tormay, who was for many years superintendent of the Trotter works of the H. C. Frick Coke Co., near Connellsville, Penn., and who is a well-known practical coal and coke expert, has devised and is patenting the door illustrated.



FIGS. 1 TO 3. TORMAY DOOR FOR BEEHIVE OVENS

In Fig. 1 on the left the door is shown open; the center, Fig. 2, shows the atendant closing the upper leaf, and the right illustration, Fig. 3, shows the door completely closed and ready for luting

The hinge part in some respects resembles that of the Lucia door manufactured by the Covington Machine Co. The lining and the methods of retaining it in place are somewhat similar to those of the Auld and McMurray types of doors. The door is fitted to take the plastic clay "daub" which is already well known in the beehive industry, being used by the Taylor Coal and Coke Co., at Searight shaft, Uniontown, Penn., and other concerns.

Door Is in Two Parts and Weighs 300 Lb.

The Tormay door is simple, easily operated and of low first cost. It can be installed for $10 complete, including the lining. No changes have to be made to the oven front such as are necessary with most permanent doors. All such changes add to the cost of installation. The low first cost of the new device should appeal to small operators, as such a door will pay for itself in less than six months from the savings effected in yield and materials.

As will be noted from the illustrations, the doors are in two sections, the lower half being swung to one side of the oven and the upper half to the opposite side, both sections resting on supports in the oven wall. However, both halves may be arranged without any difficulty to swing to the same side. The door has a back, made of ½-in. soft steel, and the daubing clay is retained on it by the extension of the metal from punch holes at regular intervals, which act as substitutes for the rivets, or fingers, in the Auld and McMurray types of door.

The lower half, with the "daub" on it, weighs approximately 160 lb., and the upper half, 140 lb., making a total weight of only 300 lb. for the entire door, including the daub, whereas other types of doors on the market weigh much more. The door has for all practical purposes a "solid back" and will not leak air and thus burn up coke.

DOOR IS INEXPENSIVE, BUT AIR-TIGHT

In Fig. 1 the door is shown open. The coke stands high in front, is well burned and shows no ashes or cutting out in front. The lining of the door faces outward, so that the coke boss can readily see whether it needs repair. In the illustration it is shown burned into a solid brick, with no shrinkage or fire cracks. Cracks that develop on the first firing are easily plastered shut. The door in question has been in service three months, with no repairs of any kind.

Fig. 2 shows the ease with which the door is opened and closed. One man can easily swing it around into place if the hinge is rigid. To take the strain off the hinge, it should be supported as much as possible by the operative in swinging it around.

Fig. 3 shows the door closed. It is luted along the sides with the ordinary loam mortar. Of course somewhat more luting will be required with a door of this type than with some of the others on the market, which are fitted with special iron frames. Especially is this true if the jambs are not kept in good repair. This trouble would not be experienced on plants operated by hand.

Mr. Tormay does not claim for his oven the permanent features of other types of oven doors. His claim is that his is a good, cheap door, which will probably last two or three years, and which should show a liberal return on the investment. Figuratively speaking, it should prove to the small operator what the Ford car is to the automobile trade.

Shipping Losses from the War

The total gross tonnage of all ships captured, detained, sunk or damaged as a result of war operations during the first 13 months of the European war (Aug. 4, 1914, to Aug. 31, 1915), according to an official press association connected with the British War Office, amounted to nearly 4,000,000 tons and numbered close on to 3,000 vessels, as follows:

	Ships	Tonnage
German	521	1,113,298
British	476	980,773
Neutral	418	593,820
Austrian	75	154,282
Allied, French, Russian, Belgian	82	128,177
Turkish	56	18,508
Total	1,628	3,088,858

In addition, cargoes (or part of them) of 776 vessels (ranging from a tonnage of 500 to 25,000) have been detained, in many cases without delaying or seizing the ship itself.

Details of German vessels which have been swept off the seas follow:

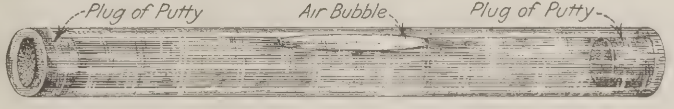
	Ships	Tonnage
Detained in United Kingdom and overseas ports	146	315,181
Captured in German colonial ports	21	43,367
Captured and sunk by British	8	29,424
Captured by British	75	186,765
Detained in Egyptian ports	18	86,038
Detained in Belgian ports	89	136,920
Detained in French and Russian ports	95	112,945
Detained in Italian ports	36	153,876
Captured and sunk by Allies	4	3,822
Captured by Allies	25	37,985
Sunk or damaged by submarines, mines or explosions	4	6,975
Total	521	1,113,298

Out of the 80 detained British vessels in German ports, more than 60 were lying at Hamburg at the outbreak of the war. Fifty-six British vessels were captured or sunk by enemy ships. The number sunk by submarines is given as 104, of 304,428 gross tons; 105 trawlers, of 15,087 tons, in addition to 31 vessels of the same class (with a tonnage of 4,229) sunk by mines or explosions. Of the Allied vessels, 14 of 37,048 tons were captured and sunk and 34 of 51,145 tons were sunk by submarines.

Engineers' Emergency Level

Every engine room has the means at hand for the construction of the convenient and accurate level described herewith. It is so simple to make as to appeal to anyone (*Power*, Aug. 31, 1915).

It consists of an ordinary gage-glass, nearly filled with water, and with its ends plugged with putty or other suitable material of a cementing nature. The bubble may be made as long as desired. As the glass is straight, the bubble will run throughout its length when one end of the tube is slightly elevated. The glass being round and usually reasonably straight, it can be turned over without affecting the location of the bubble or the accuracy of the level.



A GAGE-GLASS LEVEL

As the glass is straight and not curved to a radius like a tube constructed for leveling purposes, it is not necessary that the bubble be brought to the center. If the glass is perfectly true it will be level when both ends of the bubble are free from the cemented extremities.

The accuracy of the tube is attested by the rapidity with which the bubble passes from end to end of the glass on being slightly tilted from the horizontal position. It can be further tested by revolving the tube, part of a full turn, or by reversing its ends and noting if the bubble still remains with both ends free after this is done. If it does, its indications are probably reliable. This device is not intended to supplant the regular level, but it will serve in an emergency or when only a limited space is available.

* * *

Alabama Operators' Duty to Provide Props—The Alabama Coal Mines Act of 1911 should be interpreted as imposing an absolute duty upon operators to keep on hand a sufficient supply of props and timbers for use of miners in propping, and to deliver them on demand, but if those furnished are of suitable lengths and sizes no negligence can be imputed to an operator for failing to furnish props of the exact length demanded by a miner. (Alabama Supreme Court, Sanford vs. Stith Coal Co., 68 "Southern Reporter," 990.)

Outlook in Coal Mining

SYNOPSIS—Opinions of prominent coal-mining people throughout the United States as to the present condition and prospects of the coal-mining business. The verdict is almost unanimous in favor of greatly improved conditions this fall and winter.

More than 1,000 mine owners and officials of operating and selling coal companies were asked by the editor of *Coal Age* to give expression to their beliefs concerning the outlook in the coal trade this winter. Replies were received from every important producing field, and the following opinions are printed in the order of their receipt. No attempt has been made to eliminate unfavorable reports, so that the general verdict may be accepted as voicing the common opinion of American coal men.

The question submitted was as follows: What is the outlook for the coal business in your particular field this fall and winter? The replies follow:

NEW YORK CITY

Bulah Coal Mining Co.	Brisk
John Delaney, Mgr., Pittsvein Coal Co.	Good
W. A. Marshall & Co.	Very good
B. Nicoll & Co.	Very good; prices up

ALABAMA

S. J. Childers, S. J. Childers & Son, Jasper	Better
G. B. McCormick, Pres., Pratt Cons. Coal Co., Birmingham	Light this fall
Erskine Ramsay, Gen. Mgr., Pratt Cons. Coal Co., Birmingham	Much improved
J. C. Maben, Jr., V. P., Sloss-Sheffield S. & I. Co., Birmingham	Greatly improved within next 60 days due to rapid improvement in steel and iron business.
Sligo Coal Mining Co., Gadsden	Very much better
John R. Smith, Supt., Eagle Coal Mining Co., Jasper	Very good. We are opening a new mine and installing a new washery

ARKANSAS

Wm. C. Caudle, Gen. Mgr., Arkansas Valley Coal Co., Hackett	Moderately good

COLORADO

Pike's Peak Fuel Co., Colorado Springs	Very good in lignite coals
W. W. Curtis, Pres., Rapson Coal & Mining Co., Colorado Springs	Good
Charles Rankin, Gen. Mgr., Monument Valley Coal Mining Co., Strong	Fair

ILLINOIS

C. M. Wasson, Gen. Mgr., Wasson Coal Co., Harrisburg	Fine; extra good
P. G. Matheny, Sec., West End Coal Co., Springfield	Good
H. C. Adams, V. P., Jones & Adams Coal Co., Chicago	Greatly improved. Cars are scarce. Short cold spell would tax the Illinois mines.
E. C. Searls, Gen. Mgr., Majestic C. & C. Co., DuQuoin	Good
Charles Pointon, Sec., New National Coal & Mining Co., Belleville	Good
West Side Coal Co., Coulterville	Extra good
Thos. J. Edwards, Edwards Coal Co., Edwards	Very good
F. S. Peabody, Pres., Peabody Coal Co., Chicago	Good, with shortage of cars
Warren Penwell, Sec., Penwell Coal Mining Co., Pana	Good

INDIANA

John Hewitt, Gen. Mgr., Vandalia Coal Co., Terre Haute	Rushing
Bicknell Coal Co., Bicknell	Good
J. W. Frisz, Gen. Mgr., Kettle Valley Mining Co., Terre Haute	Good
Clay Moss, Gen. Mgr., United Fourth Vein Coal Co., Linton	Good
Sunbeam Coal Co., Terre Haute	Good
H. G. Conrad, Gen. Mgr., American Coal Mining Co., Bicknell	Good, but may be interfered with by car shortage, which is apparent at present. Some mines idle on this account

IOWA

F. H. Hunter, South Des Moines Coal Co., Des Moines	Normal
Anchor Coal Co., Ottumwa	Good
H. F. Garver, Pres., Enterprise Coal Mining Co., Des Moines	Good
Ogden Cons. Coal Co., Boone	Good; much better than last fall
K. G. Carney, Mgr., Saylor Coal Co., Carney	Good; men will be scarce
E. M. Sprecher, Gen. Sales Agt., Moulton	Good

KANSAS

Carr Coal Mining and Mfg. Co., Leavenworth	Heavier than usual
S. S. Patton, Gen. Mgr., The Patton Coal and Mining Co., Frontenac	Good

KENTUCKY

Kentucky Block Coal Co., Hazard	Good. Mines are running full time with orders ahead. New mines being hurried to completion
R. L. Wheeler, Pres., Brush Creek Mining and Mfg. Co., Wheeler	Extra good. High prices will prevail
J. L. Manring, Pres., Winona C. & C. Co., Middlesborough	Very good
Kentucky Block Cannel Coal Co., Cannel City	Good. A car shortage is threatened
C. N. Riker, Pres., Carbondale C. & C. Co., Paducah	Below normal; prices off
A. G. Spillman, Gen. Supt., St. Bernard Mining Co., Earlington	Good
W. O. Davis, Kentucky River Coal Corp., Lexington	Good. Operations all behind in orders
W. E. Davis, Gen. Mgr., East Tennessee Coal Co., Hazard	Excellent
Blue Grass Coal Corp., Hazard	Very good

MARYLAND

Wm. Ramsay, Frostburg	Very good. In Frostburg district all mines in full operation. Labor shortage surrounding districts
E. J. Roberts, Allegany Coal Co., Westernport	Fair
J. E. Hibline, Quemahoning Coal Co., Baltimore	Exceedingly good

MISSOURI

Farmers Fuel Co., Higginsville	Good on domestic coal
A. J. Moorshead, Pres., Madison Coal Corp., St. Louis	Only hope of industry in this vicinity is weather. A stiff winter may permit operators to secure some profit
Mt. Olive & Staunton Coal Co., St. Louis	Dependent upon weather
F. W. Lukins, Pres., Farmers Fuel Co., Kansas City	Good crops and good business are improving coal trade
Eureka Coal Mining and Mercantile Co., Rich Hill	Better than last fall
Laning-Harris Coal and Grain Co., Kansas City	Fair

MONTANA

R. J. Johannes, Pres., National Fuel Co., Helena	Best in history of state
Bear Creek Coal Co., Bear Creek	Especially good

OHIO

Harper Coal Co., Coalton	Good
Russell Coal and Mining Co., Cleveland	Above average. Business doubled in past 10 days. Mine running full time
John M. Wright, Pres., Raleigh C. & C. Co., Cincinnati	Good
Edward Lynch, Gen. Supt., Colburgh Coal Co., Baileys Mills	Good
The Pocock Coal Co., Massillon	Good
E. E. Learned, Sec., Elk Coal Co., Columbus	Good
Puritan Coal Co., Cambridge	Very good
W. R. Woodford, Pres., Rail and River Coal Co., Cleveland	Much better. Demand for coal improving owing to better business conditions
Edward T. Evans, Gen. Mgr., T. J. Evans Coal Co., Coalton	Fair

OKLAHOMA

H. C. Fellows, Henryetta	Exceptionally good. Junior coal company installing monster Bucyrus shovel. Fidelity Fuel Co. expects to sink two shafts
J. J. Pullen, Pres., Warden-Pullen Coal Co., Henryetta	Good

PENNSYLVANIA

(Anthracite)

A. B. Jessup, Gen. Mgr., G. B. Markle Coal Co., Jeddo	Better than past two years this fall and winter
T. M. Dodson, Gen. Mgr., Dodson Coal Interests, Bethlehem	Good
John A. Komara, Pres., West Mountain Coal Co., Jermyn	Very good
George F. Lee Coal Co., Wilkes-Barre	Very brisk. There will be big demand for coal which will be difficult to supply
E. H. Leaning, Gen. Mgr., Nay-Aug Coal Co., Scranton	Good
Chas. Schlager, Sales Agt., Traders Coal Co., Scranton	Very brisk

(Bituminous)

J. A. Gealey, Mgr., Leesburg Coal Co., New Castle	Much better
P. S. Thropp, Jos. E. Thropp Co., Everett	Nearly full time
W. V. Whiteman, Gen. Supt., Stauffer-Quemahoning Coal Co., Listie	Good. Car supply short
Keystone C. & C. Co., Pittsburgh	Better than for five years past
A. N. Cole, Gen. Supt., Pennsylvania Coal Co., Clarion	Good

Lloyd G. McCrum, W. H. Bradford & Co., Inc., Somerset	Very good. Now suffering from car and labor shortage
A. C. Speyer, Moreland Coke Co., Pittsburgh	Fair
E. J. Frauenheim, Jr., Pres., Logansport Coal Co., Pittsburgh	Greatly increased demand and better prices
Republic Iron and Steel Co., Republic	Good
J. A. Beam, Pres., Pine Run Coal Co., New Bethlehem	Better demand, and if there is a car shortage, better prices
F. H. Wigton, Pres., Morrisdale Coal Co., Philadelphia	Very active
B. F. MacCartney, Pres., Sugar Run & Dunbar Coal Co., Altoona	Very good. Not much change in prices, but big improvement in tonnage
George T. Robinson, Pres., Conemaugh Smokeless Coal Co., Johnstown	Very good. Looks like shortage of labor here
C. P. Burtner, Gen. Mgr., C. P. Burtner Coal Co., Altoona	Better. Shortage of labor and cars will restrict cutput
M. W. Saxman, Pres., Ligonier Coal Co., Latrobe	Good
W. S. Blaisdell, Anita Coal Mining Co., Punxsutawney	Good
(Coke)	
Thomas McCaffrey, Gen. Mgr., Brier Hill Coke Co., Brier Hill	Better than it has been since 1912. Shortage of miners
A. Q. Davis, Gen. Mgr., Browning Coke Co., Uniontown	Better than for two years
S. A. Carson, Gen. Mgr., Southern Connellsville Coke Co., Uniontown	Good. Expect high prices on both coal and coke due to shortage of miners. This is becoming more pronounced each day
Wm. Allison, Mgr., Union Connellsville Coke Co., Uniontown	Very good
T. S. Lackey, Pres., Buckhannon River Coal Co., Uniontown	Good. Independent operators in Fayette County expect $3 coke before spring
James Edgar Hustead, Gen. Mgr., Hustead-Seamans C. & C. Co., Uniontown	Very good. Coke business improving each month. Men will be scarce in 60 days
TENNESSEE	
James R. Wooldridge, Pres., South Appalachian Coal Operators Assn., Knoxville	Good. Less coal than usual has been yarded. European War will not affect weather where our coal is used
Wm. J. Brown, Pres., Hazard Coal Land Co., Bristol	Very good. Our lessees report abundance of orders at good prices
J. H. Jones, Gen. Supt., Durham Coal and Iron Co., Soddy	Decidedly better
S. W. Jayne, Sales Mgr., Climax Coal Co., Knoxville	Very good Not over 50% of stocks on hand and indications of a car shortage
J. J. Campion, V.-P., Carolina, Clinchfield & Ohio Ry., Johnson City	Very good
TEXAS	
L. C. Libby, Mt. Pleasant	Fair
UTAH	
George A. Storrs, Gen. Mgr., Spring Canyon Coal Co., Provo	Good
VIRGINIA	
C. B. Neil, Secy., Raven Red Ash Coal Co., Red Ash	Very good
J. L. Moon, Gen. Mgr., West Virginia Coal Co., Richmond	Exceptionally good
C. J. Creveling, Blackwood C. & C. Co., Blackwood	Good
WEST VIRGINIA	
J. W. Bischoff, Gen. Supt., Davis Colliery Co., Elkins	Better than for eight years. We are spending considerable money to be able to take care of increased business. Big problem is labor supply.
George W. Jones, Mgr., Star Coal and Coke Co., Red Star	Good
H. A. Zeller, V.-P., West Virginia Rail Co., Huntington	Good. Mines working better and prices higher
A. S. Brady, Pres., Brady Coal Co., Piedmont	Very good
J. C. Watson, Gen. Mgr., Masteller Coal Co., Keyser	Reasonably active. Demand is increasing and prices advancing
H. S. Brown, Secy., Extrapoca Coal Co., Bramwell	Good
Josiah Keely, Gen. Mgr., Cabin Creek Coal Co., Kayford	Fair
J. M. Moore, Gen. Mgr., Coal River Co., Ottawa	Very much better. Many companies declining to accept orders even at advanced prices
Alex. H. Tait, Pres., Great Scott C. & C. Co., Morgantown	Very good. Shortage of miners and cars
A. P. Brady, Gen. Mgr., Monongalia Coal Co., Fairmont	Very good
E. Echols, Treas., Big Bend Coal Co., Dimmock	Fair
J. G. Bradley, Gen. Mgr., Elk River Coal & Lumber Co., Dundon	Booming
WYOMING	
P. J. Quealy, Gen. Mgr., Kemmerer Coal Co., Kemmerer	Fairly good, but considerable over production
H. Larsen, Gen. Mgr., Nebraska Coal Co., Rawlins	About the same as usual

Extracts from a Superintendent's Diary

For some time we have been attempting to enforce the company rule that prohibits more than one day's supply of explosives to be taken into or stored at any time in a working place. It has been a trying experience.

Last week one of our firebosses suggested that we confiscate each night all of the explosives found in a working place where a full tonnage of coal had been loaded.

We discussed the matter fully and decided to adopt the suggestion without notifying the men of our decision. We assumed that the men who found themselves victims of the plot would keep silent rather than expose their malfeasance, and thus in time we could punish all of them.

Everything would probably have worked out according to schedule, but for the fact that one of our firebosses (Tom Murry) believes in practical jokes and could not resist the opportunity offered.

The day after we confiscated the first lot of explosives, Tom spread a rumor among some of the miners (picking his men so that the tale would reach indirectly certain hotheads whose powder had been confiscated) that a certain union official (Sam Rawlings by name) hadn't bought a pound of explosive in two weeks.

Tom builded better than he knew. Not one of the victims of the powder raid stopped to inquire into the source of the rumor, but every last one of them started out to find the union official on whom suspicion rested. It happened that the suspect was not at work that day, and as this became noised about to the men in the mine, suspicion was strengthened; so much so, in fact, that all of the victims began to plan openly for revenge.

In order to get the evidence in shape to justify extreme measures they appointed a committee to go to the commissary and find out just how much powder Sam really had purchased during the past 30 days. That would give them evidence that could not be questioned. The committee carried out their instructions, but when they learned that the commissary records showed Sam Rawlings to have purchased in excess of the average quantity for the month, they were dumfounded and did not know what to do or say. Instead of going back to report, they hung around, trying to fathom the mystery.

In the meantime Sam Rawlings got word that a committee was hanging around the commissary and for some reason which the messenger did not understand they were making frequent mention of Sam's name.

As soon as Sam got rid of the messenger he carried out a determination that he had had in contemplation for some time—he packed all of his belongings in a suitcase and disappeared into thin air. That same night one of our commissary clerks who knew more than he cared to divulge about Sam's reasons for departing so unexpectedly also left camp, covering his tracks as he left.

All's well that ends well, but in this instance all did not end well for the practical joker who started the ball of adventure to rolling so violently in our midst. The commissary clerk who had assisted Sam Rawlings in his treachery (whatever it may have been, and which from present indications apparently will always remain a mystery) boarded with Tom Murry, and when he quit so unceremoniously, he left behind a board bill amounting to $20, which in the course of human events would have been paid the following Monday.

Proposed System of Longwall Mining in Panels

By F. C. Cornet*

SYNOPSIS—A system of mining by longwall faces arranged in panels is here described. All haulage roads and airways are maintained in solid coal. For a given output fewer switches are required and the work is more concentrated.

No longwall mining scheme is likely to make itself attractive which does not permit of developing the mine and reaching a given output as rapidly as would be the case with the old reliable room-and-pillar system. In every case quick results are an important condition.

The scheme submitted probably realizes this end as nearly as it will ever be practicable to do when the absence of refuse material prevents the building of pack walls and all haulages and airways must be maintained in solid coal. The seam for which the system was primarily devised is 55 in. thick, all clean coal, nearly flat, and makes no water. All conditions that go toward making longwall mining advisable are met with in this seam. Observations made in old workings warrant the expectation that simple propping, using posts of 5 in. diameter set 7 ft. apart in both directions, will maintain, for months if necessary, a clear space of 20 to 30 ft. between the edge of the falls and the working face. Fig. 1 shows how it is intended to develop the mine, the full lines indicating to what extent it will probably be necessary to develop it in order to reach an output of not less than 1,000 tons in a 9-hr. day, using only one man in each place, narrow or wide, and allowing a space of 20 ft. to each loader working on longwall. No crosscut is counted as a place. The dotted lines in Fig. 1 show what little amount of extra development would be necessary in order to increase the output by about 300 tons. As may be seen from Fig. 1, a long face is primarily formed by one of the ribs of what has been designated as a long room. The so-called border rooms, driven on the same course as the lateral entries and consequently at 90 deg. with the long room, always well ahead of the latter, determine the length of the long face, which in this case is 500 ft., although it could well be made substantially longer.

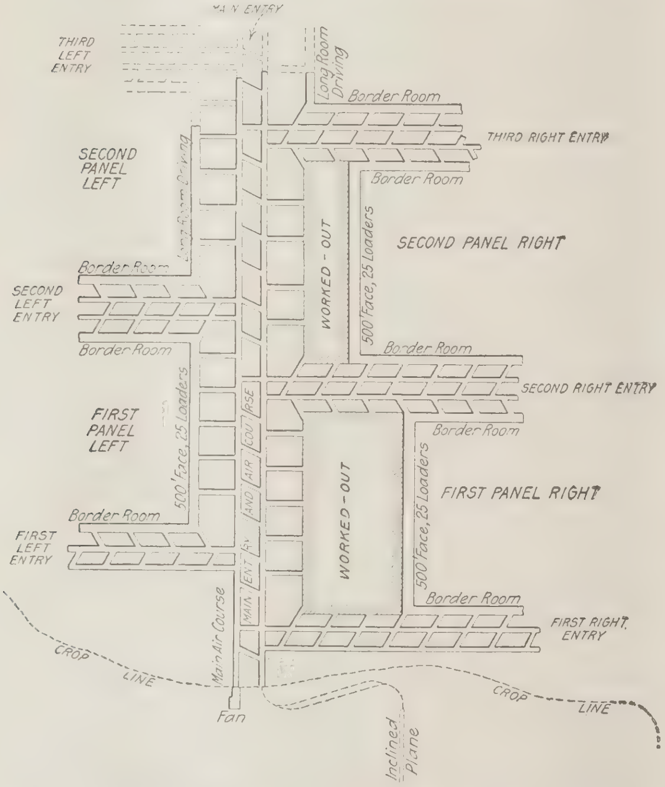


FIG. 1. SHOWING HOW IT IS INTENDED TO DEVELOP THE MINE

The long rooms and border rooms are driven wide, as are also the crosscuts or passageways by which the border rooms are reached from either the corresponding lateral haulage or air course. This reduces the amount of narrow work in a given entry to exactly what it would be in the case of the room-and-pillar system. Fig. 2 shows how ventilation and haulage are done, the second panel right having been selected from Fig. 1 and drawn on a much larger scale in order to make plainer such details as overcasts, stoppings, regulators, curtains, haulage tracks and switches and also the directions of all air currents.

The distribution of air shown in Fig. 2 is probably the most advisable one in the case, but it would not be difficult to show one or two other systems of haulage tracks just as good as the one here drawn.

Face Is Supplied with Cars from Both Ends

The tracks shown in Fig. 2 are so arranged that the lower half of a longwall face is supplied with empties and the loads removed from the lower end, while the service of the upper half is effected from the upper end. This makes it unnecessary to stop all work in more than one-half of each face while a trip of cars is being changed. It also cuts in half the number of cars to be taken in or out at one time. Twelve or 14 cars might well be handled by one gathering motor, while 24 or 25 cars would be too many to be pushed in or pulled out by the same machine at one operation.

In figuring the output of the mine shown in Fig. 1, it has been assumed that a coal loader requires 20 ft. of space in order to work freely and at his full efficiency, loading 12 tons a day. This would place 25 loaders along a 500-ft. face, loading 300 tons a day. In this coal, a machine cut 5½ ft. deep and 500 ft. long will yield 600 tons; consequently, two days will be necessary to load out one cut.

If necessary, by allowing only 10 ft. of space to a loader, placing 50 men on each face instead of 25, a cut could be cleaned up in a day; but this might prove too crowded a condition and one which would not give each man enough space and freedom to load all the cars he could get. The 20-ft. space adopted in the output calculations is

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*317 Laidley St., Charleston, W. Va.

perhaps a little large for one man, but this only shows that there is no exaggeration in an output of 300 tons a day from a 500-ft. face.

In case of necessity, the loading force could be increased to, say, 35 men, and while under these conditions the output per man might be reduced to 11½ tons per day, it would increase the output of a face to 402 tons per day. All mining men will easily remember occasions in their experience when they would have been glad to increase by 33% and with little trouble the output of some part of their mine.

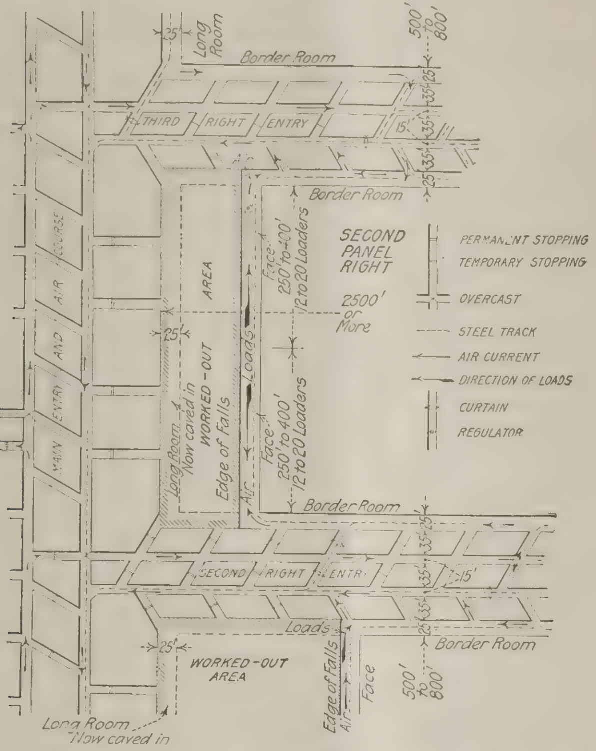

FIG. 2. PLAN SHOWING VENTILATION AND HAULAGE

Fig. 3 shows how a room-and-pillar mine would appear after driving the same total length of narrow work as in the longwall mine shown on Fig. 1. In both cases, the total length of haulways and airways is 7,680 ft. It is absolutely fair to suppose that the development work in the room-and-pillar operation would not be done quicker than in the longwall case. Fig. 3 shows the mine with all rooms 30 ft. wide, driven on 60-ft. centers, all the rooms being 300 ft. long. All this is considered good practice in the coal field under consideration. The same thickness of protective pillar, 100 ft., has been kept on each side of the main entry and air course in both the room-and-pillar and the longwall cases.

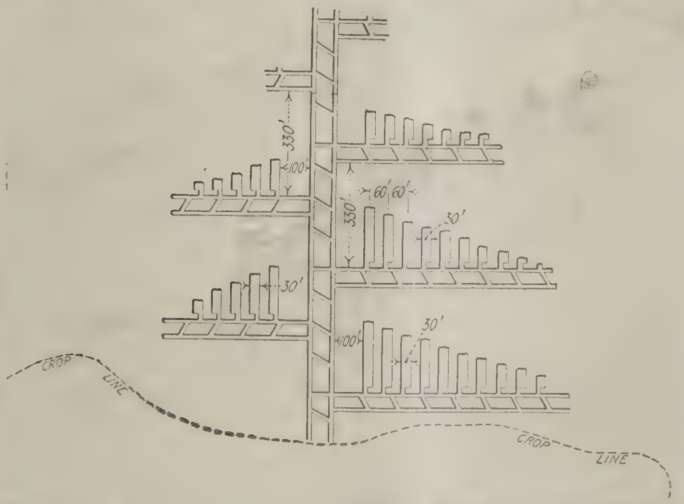

FIG. 3. A ROOM-AND-PILLAR MINE WITH SAME LENGTH OF NARROW WORK

The accompanying table gives a good idea of the comparative standings of the two mines so far as the operating features and outputs are concerned. These figures speak for themselves and need no comment.

COMPARISON OF TWO SYSTEMS OF DEVELOPMENT

Longwall Mine:	
Men on longwall, 75, loading 12 tons each	900 tons
Men in wide places, 10, loading 11 tons each	110 tons
Men in entries, 12, loading 10 tons each	120 tons
Total conservative output of the mine per day	1,130 tons
Total length of narrow work	7,680 ft.
Total length of steel tracks	8,450 ft.
Number of switches in the mine	35
Room-and-Pillar Mine:	
Men in wide places, 39, loading 11 tons each	429 tons
Men in entries, 16, loading 10 tons each	160 tons
Total conservative output of the mine per day	589 tons
Total length of narrow work	7,680 ft.
Total length of steel tracks	9,120 ft.
Number of switches in the mine	54

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New Coal Rates in Ohio

There is no car congestion in Ohio as yet, although the railroads appear to have some anxiety along these lines. It has been stated on what appears to be good authority that the situation in Ohio so far as the railroads are concerned will be relieved in the near future by a readjustment of rates and that Toledo will become the basing point in fixing the new rates on coal shipped from Ohio and West Virginia mines to points in Ohio, Michigan and Indiana. New coal freight-rate schedules, it is stated, will be filed with the Interstate Commerce Commission within 30 days.

The railroads that have become parties to the agreement are the coal-carrying lines of western Pennsylvania, Ohio and West Virginia. The new schedule will increase by 60 per cent. the differentials in favor of Ohio coal as against West Virginia coal. The rate on West Virginia coal to Toledo is to be 40c. greater, according to the agreement, than the rate from the Ohio mines. The rates on West Virginia coal to all other points in Ohio, Michigan and Indiana are to be increased proportionately. This action is designed to relieve the situation in the Hocking and other Ohio coal fields, where mines are closed and miners are suffering greatly.

W. A. Gosline, Jr., head of the Toledo Chamber of Commerce and president of W. A. Gosline & Co., in a recent interview concerning the matter said: "The proposed increase in rates will help some, but will not entirely solve the problem. There are other important elements that have contributed to the closing of the mines and the consequent deplorable plight of the miners. Among these are conditions imposed by the miners themselves that the operators have been unable to meet. If the problem is to be solved entirely the miners must meet the operators half way. The increased differential in favor of Ohio coal is but one step. The state screen law is no longer much of a factor, as some of its most serious provisions have been eliminated." Mr. Gosline is doubtful whether the action of the railroads will influence the reopening of the mines.

Repairing Broken Tapes

By H. M. Wassum*

Steel measuring tapes are frequently broken even when handled carefully. The repairing of a broken tape has often been a somewhat lengthy job and one not relished by the average mine engineer. However, it has well been said "that necessity is the mother of invention," and within late years the mending of a broken tape takes only a few minutes' time.

Many surveyors carry a small vial containing a solution composed of zinc chloride ($ZnCl_2$) and a little water, a small coil of ⅛-in. round solder and several thin strips of tin about ½ in wide. Sleeves just large enough to slip over the ends of the tape can be quickly made from the tin. After the dirt and rust have been thoroughly scraped off the tape and the broken ends brightened the latter are dipped in solution and the tin sleeve slipped on.

By holding an open light or a match beneath the sleeve, the tin and tape, being thin, will heat rapidly, and if the solder is then touched to the joint it will melt and fill all the spaces. If too much solder sticks to the joint it can be brushed off before it cools, and a neat, strong joint is the result.

There is now on the market a kit called the "Eureka Tape Repairer." It is a small round box containing a dozen tin sleeves cut to the correct width and coated with solder solution. The box also contains a small piece of emery cloth for use in brightening the broken ends. Complete directions are printed on the box and if followed a neat joint as strong as the original tape can be secured. The kit can be carried in the vest-pocket and has the advantage of containing nothing breakable.

* * *

An Electric Safety Lamp

In 1912 the British Home Office held an international competition for the best electric mine-safety lamp, open to all competitors both British and alien. There were 197 competitors, a number of whom were British. Though their lamps contained many excellent qualities, with characteristic fairness the first prize was awarded to a German firm—the Concordia Electricitäts Actien Gesellschaft of Düsseldorf. This lamp was known as the "Ceag."

In 1913 this same lamp took first prize at Ghent, and this year the Concordia Safety Lamp Co., Inc., of Pittsburgh, Penn., was awarded approval No. 12 of the Bureau of Mines for safety, efficiency and practicability under the exacting schedule 6A. The lamp thus approved was substantially the same as that awarded first prize in the British competition. As a further recognition, the Concordia Safety Lamp Co., Inc., was awarded a gold medal at the Panama-Pacific International Exposition. This award was made in recognition of the excellence of the electric mine lamp presented and of the lamp house and accessories. The firm was also given a silver medal in recognition of the exhibit that it made in collaboration with the United States Bureau of Mines.

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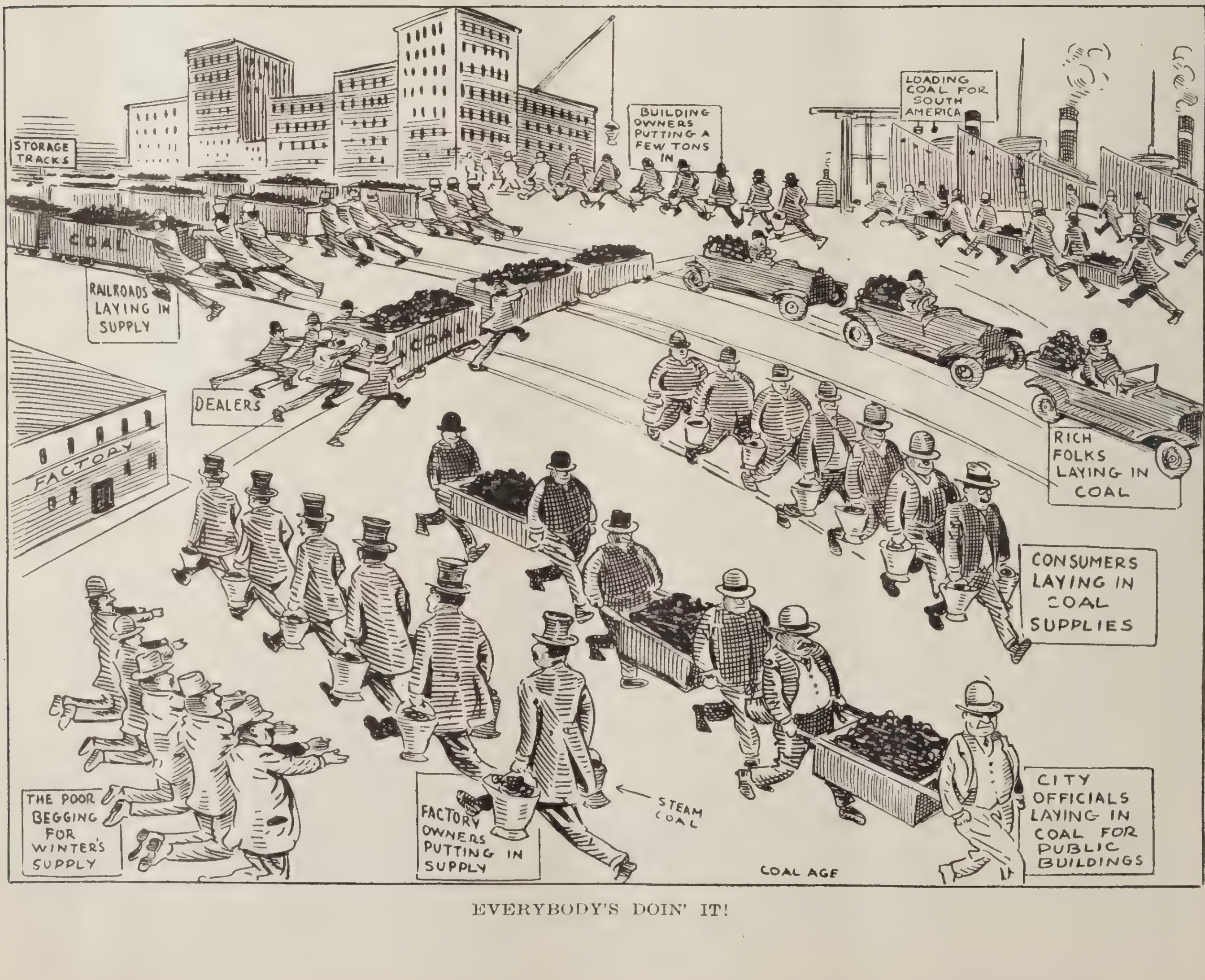
*Brier Hill Coke Co., Brier Hill, Penn.


STORAGE TRACKS
BUILDING OWNERS PUTTING A FEW TONS IN
LOADING COAL FOR SOUTH AMERICA
COAL
RAILROADS LAYING IN SUPPLY
COAL
DEALERS
FACTORY
RICH FOLKS LAYING IN COAL
CONSUMERS LAYING IN COAL SUPPLIES
THE POOR BEGGING FOR WINTER'S SUPPLY
FACTORY OWNERS PUTTING IN SUPPLY
STEAM COAL
COAL AGE
CITY OFFICIALS LAYING IN COAL FOR PUBLIC BUILDINGS

EVERYBODY'S DOIN' IT!

Analysis of the Coal-Car Situation

Compiled by A. T. Shurick

Supplementing the article on the car-supply outlook which appeared in *Coal Age* of Sept. 25, p. 506, we present herewith some statements received since the previous article was printed.

Baltimore & Ohio R.R.

The matter of car supply is receiving careful consideration and plans are being formulated to meet the situation by expeditious handling and loading along scientific lines. Orders were also placed during the last few months for additional coal cars and contracts let for rebuilding part of our present equipment. The outlook this year is similar to that of 1913, when traffic was unusually heavy; but in view of the purchases of new equipment since then, both cars and locomotives, it is believed that the business will be handled with even greater facility. Another favorable factor is the improvement work completed since 1913, providing additional tracks, yards and other facilities.

During the last month the board of directors authorized the construction of what will be the largest coal pier ever built, costing approximately $1,500,000 and having a capacity of 10,000,000 tons a year. This will require about eighteen months to build, so it will not be available this year; but it indicates the provision which the road is making for future terminal facilities. This road has expended during the last five years about $100,000,000 for general rehabilitation, extra running tracks, larger yards and bigger docks and equipment.

Chief among these improvements were the third and fourth track lines on the eastern end of the system in the mountainous districts, where grades were reduced and curves eliminated. The Magnolia cutoff, a 12-mi. short line east of Cumberland, which provides a low-grade line for coal traffic, was opened recently. This involved an expenditure of about $6,000,000. The average trainload over that section of the line has been raised from 550 tons in 1910 to 1,132 tons at the present time.

A large classification yard has been constructed at Grafton, W. Va., with a capacity of 1,200 cars. To further facilitate the movement of coal from the Grafton, Fairmont and other regions of West Virginia to the Great Lakes a bridge was built across the Monongahela River between Hayward and Lumberport, which has also been augmented by a yard at Hartzell, W. Va., for the making up of trains for the lake traffic. This has made it possible to route the heavy traffic over the light grades of the West Virginia Short Line and the Ohio River branches. The yard at Holloway, Ohio, was enlarged for the coal destined to the lakes.

To meet developments in the Somerset region of Pennsylvania we have built a 9-mi. extension of the Quemahoning branch. A large assembling yard, used chiefly for coal, with a capacity of 450 cars, was constructed at Somerset, Penn. A low-grade line was built between Rockwood and Garrett, as a part of the enlargement of facilities in the Somerset region, which makes it possible to operate trains of maximum tonnage.

At Baltimore the capacity of the receiving yard in the Curtis Bay coal terminal was increased to 2,390 cars by adding facilities for 800 extra cars.

Since July 1, 1909, the road has bought 33,153 freight cars, 25,000 of which were for the coal trade, and 691 locomotives, of which 595 are in freight service.

Illinois Central R.R. Co.

By W. L. Park, Vice-President

From the experience gained in handling the coal traffic of the 1914-15 coal season the Illinois Central finds itself unusually well equipped to take care of the prospective traffic of the 1915-16 season.

Great strides were made during the last coal season toward placing the Illinois Central in a physical condition to handle all the traffic offered. The additions made to the coal-car equipment, as well as freight engines and switch engines, together with grade reductions, new second track, yard extensions and improved mechanical facilities, which were undertaken or completed during that time, have been unusually large. These included an investment of about $11,589,000 for new rolling stock, as follows: 7,500 new all-steel coal cars, 100 Mikado type freight engines, 62 switch engines and 45 Pacific-type locomotives, which relieved a number of freight engines theretofore used in passenger service.

An adequate supply is still further assured by reason of increased efficiency in car movement as a result of the purchase of 50 freight and 22 switch engines, which were put in service during March, April and May of this year, and another lot of 50 engines ordered for delivery this season. In addition the continuous service of several thousand wooden coal cars is assured during this season, due to steel underframe reinforcement and body reconstruction work done on them during the last year.

In view of the foregoing and the fact that the Illinois Central had a generous surplus of coal cars on its lines throughout the entire 1914-15 coal season, we approach the coming period of heaviest coal loading without any misgivings as to our ability promptly to meet car requirements for all the traffic which may be offered, even though it materially exceed the amount handled in any previous season.

Chicago & Eastern Illinois R.R.

By William J. Jackson, Receiver

In view of the large anticipated crop movement and the stimulation of general business conditions, it is our opinion there will quite likely be a coal-car shortage. Added to the general improvement in business is the prospective shutdown of the mines next April on account of the coal-miners' wage agreement expiring at that time. This should stimulate business during the winter months, when large consumers will want to stock coal, and will have a further tendency to make a car shortage.

It is a satisfaction to be able to state that this road was never in a better physical condition to cope with the demands of a heavy coal traffic or the needs of the coal trade. Large expenditures have been made, and the roadway and equipment are in first-class condition to handle expeditiously a big tonnage. If the producers and consumers will coöperate with the railroad in handling the traffic by promptly loading and unloading the coal cars, the fast service which we are prepared to give should minimize any car shortage.

The Labor Situation

SYNOPSIS—The labor leaders in the Hocking Valley region of Ohio meet to discuss whether they will keep their plighted word, and adjourn deciding they will not. Most of the Hocking operators will remain idle till the April settlement. The Colorado Fuel and Iron Co. prepares to sign a contract with its men.

Thomas Butler, the man who ventured to criticize the mine officials of District No. 9 of the United Mine Workers of America and was suspended from membership, is endeavoring to have the injunction prohibiting his exclusion from the union made permanent. James J. Moran and James B. Reilly, who are the attorneys for District President James Matthews and other officials of the district, filed on Sept. 28 a denial of the charge that they conspired to keep the name of James Butler off the ballot for district president.

The case is quite important, as it will decide whether the officials or the men constitute the union. The miners have objected because Professor Scott Nearing has been excluded from the University of Pennsylvania for his socialistic utterances but the muzzling of Butler is like an exclusion of one of the paying students and not of a hired member of the faculty. It may always be permissible to hold the employers of a state, university or union to a strict accountability but we strike at the freedom of the people when we forbid the electorate to express its opinions. It is therefore hoped that Judge Brumm who is trying the Butler case will decide to free the union electorate from any trammels which may be put upon it by the officials.

Hocking Valley Miners Repudiate Agreement

The miners' convention in the Hocking Valley subdistrict in session at Athens, Athens County, Ohio, invited the Hocking Coal Operators' Association to meet with them and discuss the situation. But the convention which followed was entirely without result. The miners' state officials, President John Moore, and Secretary-Treasurer Savage told the assembled delegates and operators that the clause regarding working conditions was not a part of the wage contract and that the joint scale committee had not even considered such a clause at the time of the last joint convention when the Hocking scale was made.

The clause requiring equal conditions in the districts was not signed by the miners as it was not actually in the contract. There was a verbal understanding only. The contract proper was signed by the miners' representatives and when the operators were asked to affix their signatures they added the clause that expressed their understanding of the contract placing it below the signatures of the miners' representatives. To the whole document as amended the operators appended their signatures.

It is clear that the operators are not bound by their agreement because the miners have violated the clause subject to which the operators signed their assent. But the miners' leaders had previously agreed verbally not to violate the condition appended to the contract and by accepting it as it was written laid themselves still further open to compliance with its provisions. If the clause is not binding on the consciences of the miners, then the operators could never have been bound by their signatures. By endeavoring to escape the clause the miners convict themselves of double dealing.

Six Months of Idleness in Eastern Ohio Threatened

The operators producing 75 per cent. of the tonnage declare that they will not open their mines till the April, 1916, settlement is reached. Thus six months or more of idleness is likely to follow the decision of the miners. Meanwhile many changes may occur. Improved times may make the operators more ready to start work because operation may become temporarily profitable regardless of the conditions and the wage scale. Moreover, the burden of poverty may bear heavily on the miners. There are 8,000 of them idle, and the union has promised to help them as it did the eastern Ohio miners to whom $1,500,000 was contributed.

President Moore asserted that internal differences among the coal operators and price cutting and not unfair conditions were the main factors which were destroying the coal business in Ohio. Among those declaring that their mines will be shut down are John H. Winder, manager of the Sunday Creek Coal Co. and G. C. Weitzell, president of the New Pittsburgh Coal Co. The latter declared that the mines would shut down at the close of navigation and remain idle till Apr. 1 of next year or until the miners made concessions similar to those granted operators in eastern Ohio.

The arbitration board in the eastern Ohio field consisting of C. J. Albasin, J. J. Roby and Thomas P. Wangler—the first two representing the miners and operators, respectively, and the last being the umpire—have been considering difficulties arising under the recent agreement. The miners and operators were not able to reach an understanding, and so the arbitration board was established.

The first matter considered was whether the miners at the Pursglove-Maher Coal Co.'s mine were subject to a fine of a dollar per day for going on strike. The union declares that the miners were not authorized in quitting work.

Under the agreement the miners are not permitted to strike for any other cause than nonpayment of wages. The conciliation and arbitration boards are supposed to look after their needs without the necessity for striking. The miners claim that the operators locked them out and that they were not responsible for the stoppage of work.

Strikes Which Are in No Way Discreditable to the Miners

On Oct. 1 the miners of the George M. Jones Coal Co., at Bellaire, Ohio, went on strike to enforce run-of-mine payments. But to their great credit they decided after a day's idleness and a meeting to give the company more time to install the necessary scales. The miners could hardly be blamed if they violated their agreement to bring to an end such an obvious breach of contract as the failure to place and use scales by which all the coal mined could be weighed.

The union has announced that it will stand by the men in such violations of the agreement and no just complaint can be made of its action. The Pulteney miners have twice extended the time allowed their employers for placing run-of-mine scales, but no scales have yet been installed. It is useless for the operators to condemn the union if they do not propose to do any better.

Rockefeller Delivers His Industrial Representation Plan

On Oct. 2, 30 miners' representatives met the officials of the Colorado Fuel and Iron Co. in the club room of the steel plant at Pueblo, Colo., John D. Rockefeller, Jr., being present. Mr. Rockefeller described in detail the industrial representation plan devised by him and W. L. Mackenzie King. He explained that he and the other holders of C. F. & I. Co. stock had not received a cent from their holdings for 14 years. He condemned those who urged the miners to do as little as they can and get as much as they can for what little they do.

Among the delegates were seven members of the United Mine Workers of America representing the miners of Fremont County who had at one time been on strike against the company. The details of the plan will appear in the issue of "Coal Age" of Oct. 16, and one feature of it is commented on editorially in this present number. Five out of the eleven directors of the Colorado Fuel and Iron Co.: John D. Rockefeller, Jr., J. F. Welborn, president; S. G. Pierson, vice-president; J. A. Writer, secretary, and Cass Harrington, general counsel, held a meeting on Oct. 4 and approved the new arrangement unanimously. The other directors are expected to sign the minutes so as to give final ratification for their side of the agreement.

The delegates submitted it to a referendum of the miners and the vote received up till Oct. 5 showed that the ayes were 11 times as numerous as the noes. The ballot showed on that date 1,192 votes in favor of the agreement and 106 votes opposed. The union, of course, condemns this arrangement in which it does not share but which it appears powerless to prevent.

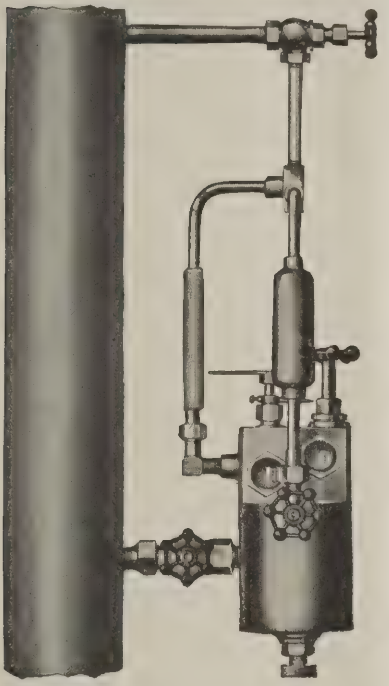
There is much talk that the cases against the 400 rioters who committed pillage, arson and murder will be withdrawn. Several citizens of Colorado, and some say John D. Rockefeller, Jr., have asked that this be done, but both the governor and Mr. Rockefeller deny that the latter has made any such request. John McLennan, the district president of the United Mine Workers' Union, has asked for this disposition of the cases and every indication seems to favor such a result.

The crimes charged are extremely flagrant and should be punished. The practice of sentencing men for trifling offenses and pardoning the most cruel and violent is getting only too frequent. We are afraid we might hurt the better and nobler instincts of a murderer by making him suffer his penalty. The minor criminal who is far more worthy of consideration serves the full extent of the law because by the unimportance of his case he fails to arouse the interest of the public.

New Apparatus and Equipment

New Grease Lubricator

A new and improved type of drop-feed grease lubricator, known as Class D, is now being offered to customers of the Ohio Grease Co., of Loudonville, Ohio. This is said to be the "last word" in lubricator construction. It is extremely simple and contains many points of refinement, such as better feed regulation, smaller drops, more perfect atomization, insulated tubes, protected sight glasses, etc.



THE NEW LUBRICATOR

Reports show that this lubricator is giving even better service than those which this company has put out in the past. This new instrument, like its predecessors, is not sold, but is loaned and kept in repair free for the purpose of feeding Ohio cylinder grease.

The grease has recently been greatly improved through the discovery of better raw materials and new methods of compounding. The company reports that the combination of this new lubricator and better grease has resulted in success wherever they have been used.

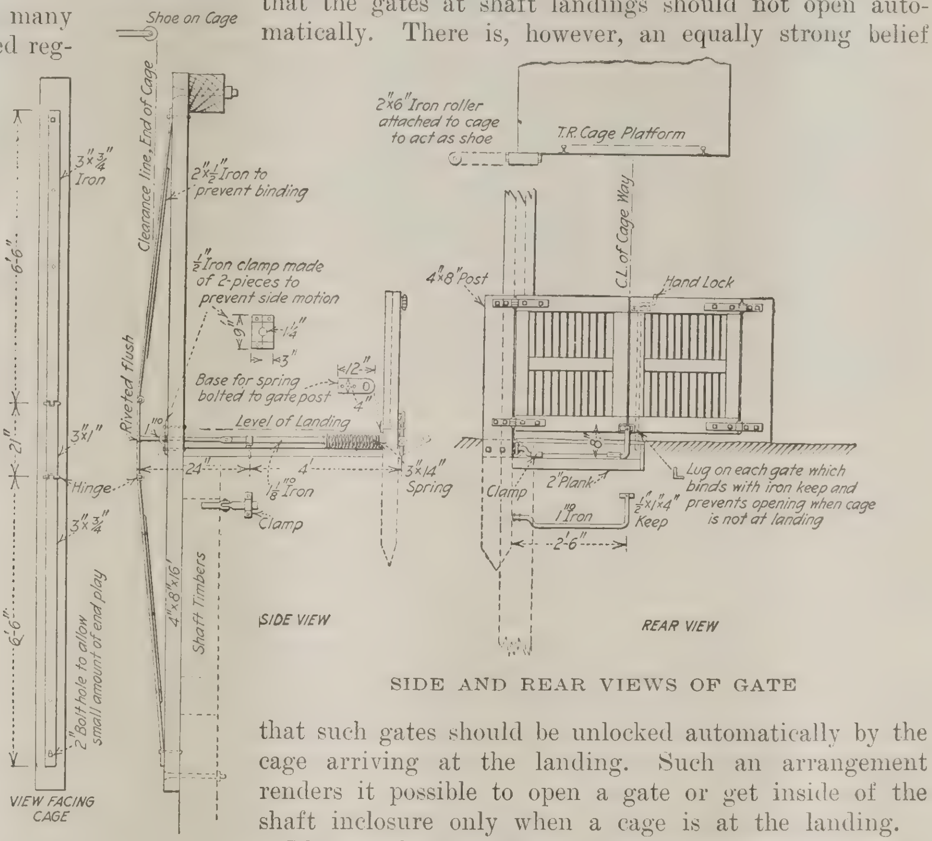
※

A New Safety Shaft Gate

A new type of safety gate for mine shafts has been invented and placed on the market by Lewis Hohnke, of Allport, Penn. This gate is shown in the accompanying illustration.

The gate is located at a landing where the cage comes to rest for the purpose of loading or unloading men and material. It does not open automatically and can be opened by hand only when the cage is in the proper position. It may, however, be closed by a spring or a weighted cable. The arrangement here shown, which effectively prevents the gate from being opened when the cage is not in its proper position at the landing, prevents anyone from falling into the shaft.

There is a strong belief among many mining officials that the gates at shaft landings should not open automatically. There is, however, an equally strong belief that such gates should be unlocked automatically by the cage arriving at the landing. Such an arrangement renders it possible to open a gate or get inside of the shaft inclosure only when a cage is at the landing.


Shoe on Cage
Clearance line, End of Cage
3"×3/4" Iron
6'-6"
21"
6'-6"
3"×1"
Hinge
3"×3/4"
2" Bolt hole to allow small amount of end play
VIEW FACING CAGE
Riveted flush
2"×1/2" Iron to prevent binding
1/2" Iron clamp made of 2-pieces to prevent side motion
6"
1 1/4"
3"
Base for spring bolted to gate post
12"
4"
Level of Landing
1"
24"
4'
1 1/8" Iron
3"×14" Spring
Clamp
4"×8"×16'
Shaft Timbers
SIDE VIEW
2"×6" Iron roller attached to cage to act as shoe
T.R. Cage Platform
C.L. of Cage Way
4"×8" Post
Hand Lock
8"
Clamp
2" Plank
1" Iron
1/2"×1"×4" Keep
Lug on each gate which binds with iron keep and prevents opening when cage is not at landing
2'-6"
REAR VIEW

SIDE AND REAR VIEWS OF GATE

The gate here described complies with art. viii. sec. 1, of the state mining law of Pennsylvania of 1913, and a gate of this type has been installed and is now in daily operation at a plant of the Morrisdale Coal Co., Morrisdale, Penn.

※

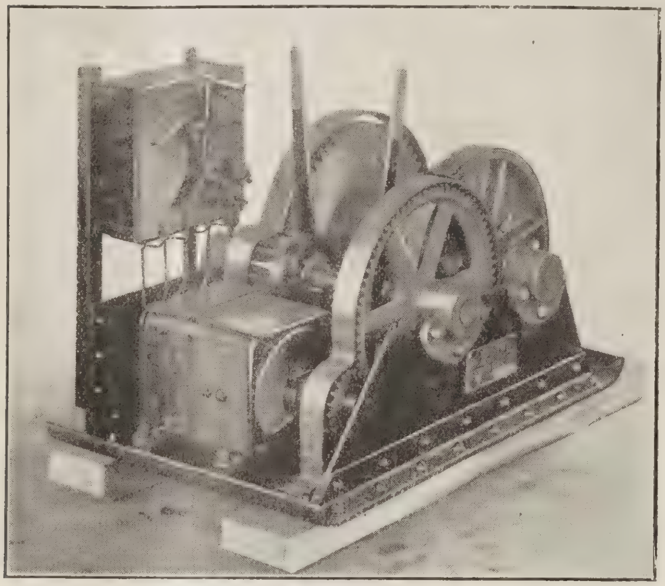
Portable Electric Room Hoist

The room hoist shown in the accompanying illustration has been placed upon the market by the Mead-Morrison Manufacturing Co., of East Boston, Mass. This machine is perhaps of more general or all-around use than any other to be found in the mine. It is self-contained, compact and powerful, making it readily applicable to many of the hauling problems encountered underground.

The frame is made of structural and plate steel, thus lessening the possibility of breakage in this part of the mechanism. The entire machine is mounted on steel skids and may thus be easily moved from place to place. The operating mechanism is simple and may be handled by almost any one.

A jaw clutch permits of the drum being thrown out of gear, allowing the miner to carry the rope back in the entry to his car, then return to the hoist and pull his load out. The gear ratio is such that a maximum of power is transmitted to the drum, thus permitting heavy loads to be handled.

This hoist has been kept small and compact so that it could be used in places not accessible to mules. It is powerful, however, and may be used in large mines, not only at the mouth of entries to collect the cars to that point in place of a gathering locomotive, but also in moving cars under and around the tipple, and for other general haulage purposes about the mine.



THE NEW ROOM HOIST

This machine is commonly built in two sizes, either of which may be equipped with alternating- or direct-current motors. The sizes are 2-hp. (capacity on single-line 600 lb. at a rope speed of 100 ft. per min.) and 4-hp. (capacity 1,000-lb. pull on a single line at a rope speed of 125 ft. per min.).

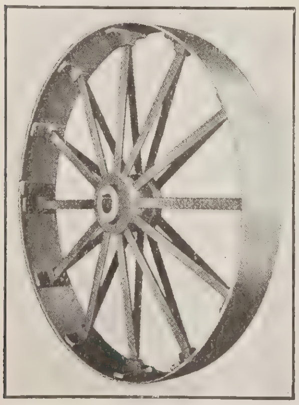
⁂

A New Heavy-Duty Pulley

A type of pulley designed for special and heavy service is being placed on the market by the Medart Patent Pulley Co., of St. Louis, Mo.

In the construction of this pulley the arms are made of flat, wrought steel. The hubs and rim lugs, of semi-steel, are cast onto the ends of the arms or spokes, which are so shaped as to afford a perfect and rigid connection. The rim lugs are ground to a perfect circle, and a heavy steel-plate rim is attached by rivets. There is thus no shrinkage stress whatever upon any portion of the pulley.

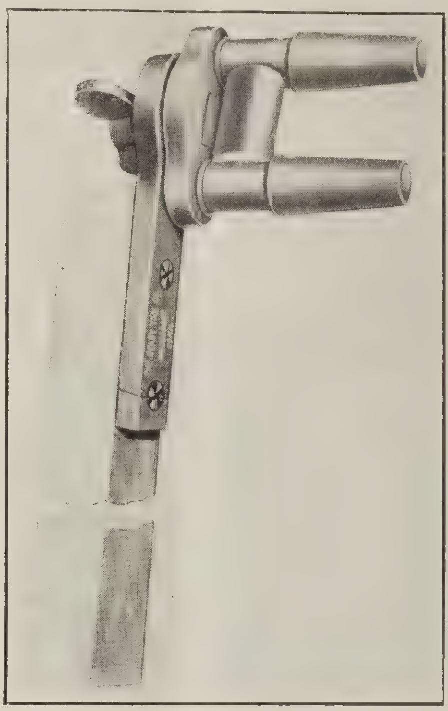
This type of pulley may be constructed with a single or double set of arms, also in either solid or split type in any diameter from 3 ft. to 15 ft., and with a face up to 50 in. in width. The arms, hub, lugs and thickness of rim may be made to suit conditions of severe service.



HEAVY DUTY PULLEY

Safety-First Belt Shifter

Everyone about the mines who has had experience with belts appreciates the annoyance, difficulty and danger in replacing the belts upon pulleys on line or counter shafting. To obviate these, the Ready Tool Co., of Bridgeport, Conn., has placed on the market what it calls a "safety-first" belt shifter or belt stick.



THE SHIFTER ON POLE

In place of the hook or pin usually found on the end of a belt-shifting pole, this belt shifter carries a swiveling head on which are located three rollers—one with its axis parallel to the yoke upon which it is carried, while the two others are set at right angles to this yoke. The latter are tapered toward their outer ends.

Due to the taper of the two transverse rollers, there is no chance of the shifter being caught in the belt. After the belt is placed in the fork the tendency at all times is for it to slide onto the pulley and the fork to move away from the belt, thus overcoming the possibility of accidents.

This simple device not only saves time but furnishes a safe means of shifting belts and throwing them on or off a pulley while the latter is in motion.

⁂

Mine-Refuse Disposal Dump

A type of dump designed especially to handle a maximum amount of mine refuse with the minimum amount of labor, to avoid cribbing and trestling, and to enable a pile of any desired shape to be formed, has been recently placed upon the market by the Dempcy-Degener Co., of Pittsburgh, Penn., and is known as the Saxon movable slate dump.

This dump consists essentially of a movable cantilever tipple, which overhangs the dump proper and deposits the material sufficiently far ahead to build its own roadbed. It is fitted with an electric rope hoist having a capacity of approximately 2,000 ft. of wire rope. This hauls the loaded cars from any convenient

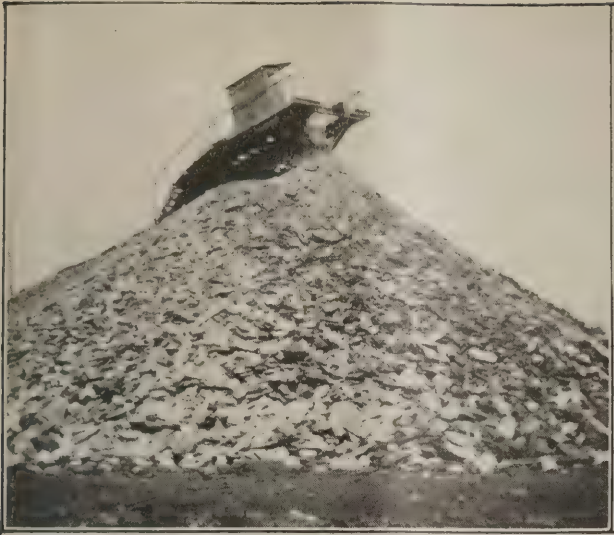


FIG. 1. FRONT OF REFUSE PILE

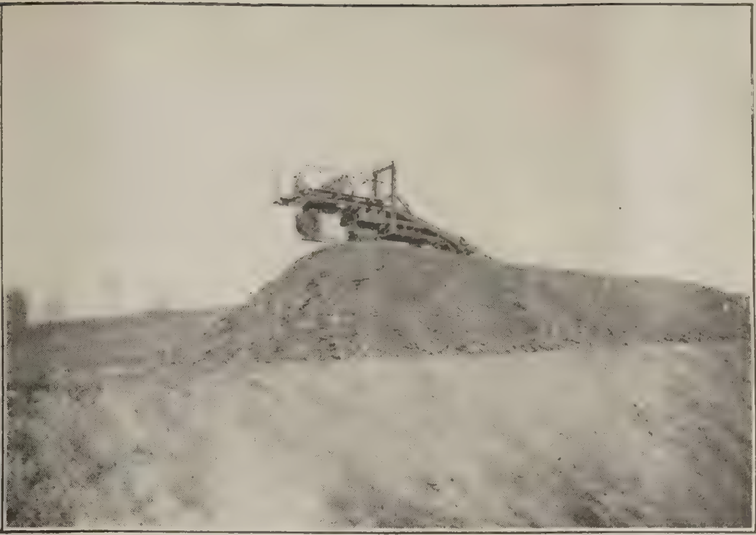


FIG. 2. SIDE VIEW OF PILE AND DUMP

point, dumps them and returns them to the empty track or place of loading.

It is possible for two men to dump slate at the rate of from 20 to 40 cars per hour. If, however, the output is small and it is only desirable to employ one man, he can handle from 6 to 10 cars per hour. In other words, the machine hauls and dumps the cars, and by its use one or two men should be able easily to handle all the slate from an ordinary mine.

These dumps may be employed on a steep incline, thus largely increasing the capacity of a given piece of property for the storage of refuse. It is possible to handle on this machine either the ordinary mine cars themselves or to use monitor cars, into which the contents of the mine cars are deposited, the monitors being hauled up the incline and emptied in a manner exactly similar to that employed for the mine cars.

By the use of this machine it is practically never necessary to employ more than two men for handling the entire output of refuse from a mine. In case the quantity of rock to be handled is small and the length of haul short, one man can easily do this work. Two operators can move the dump forward when this becomes necessary, level the roadway and build in tracks in about an hour and a half. On account of the long overhang of the machine, it is necessary to do this work of moving the machine forward to a new position only at long intervals.

The control of the machine is located at the proper place—namely, the dumping point—enabling the operator to attend to any difficulties which may arise here, such as material choking in the cars, etc. This also avoids the danger of running the car off the pile as sometimes happens when the hoisting machinery is distant from the dumping point and a code of signals is depended upon.

Many of these machines are now in successful operation, the number of cars being handled per day ranging from 120 to 265, while the weight of the loaded car ranges from 6,000 to 13,000 lb. The motor power in these installations varies from 25 to 66 hp., and the grade of the dump from 10 to 33 per cent.

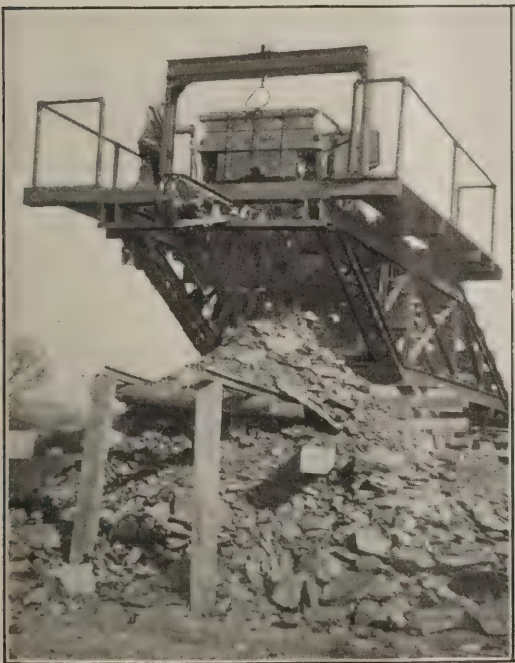


FIG. 3. CAR DUMPING

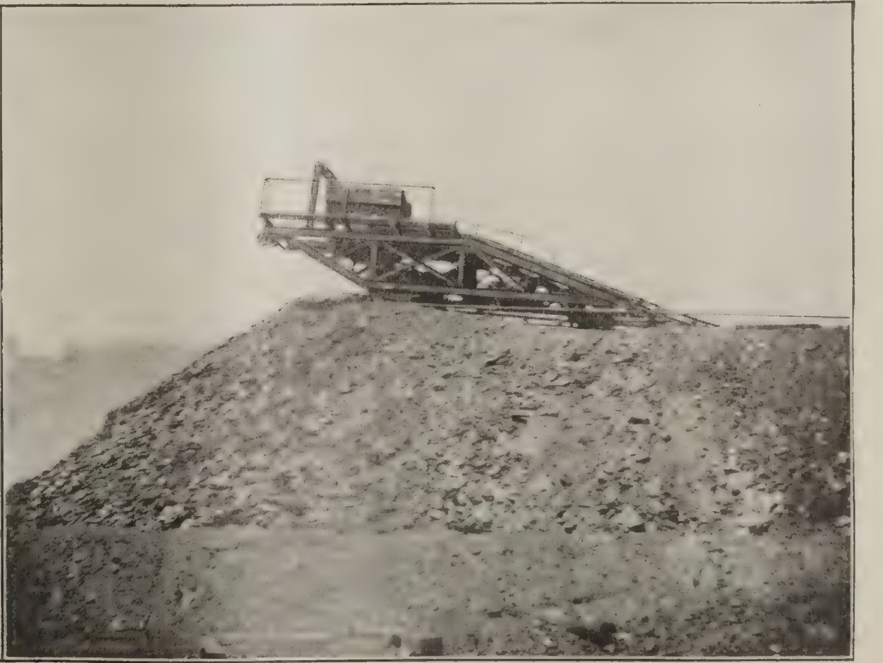


FIG. 4. SHOWING OVERHANG OF DUMP

Editorials

An Impending Shortage in the Middle West

One of the best-informed wholesalers in Chicago states that a close analysis of the market situation at this time shows that the retail dealers generally throughout the Western States have not received anywhere near their usual quota of coal and that shipments so far have been far below normal. This shortage will have to be made up within the next few months in order to meet the consumers' demands.

A 20-per cent. increase over the current demand will create a shortage in nearly all fields. In many cases foreign laborers have left the coal fields for their native countries, while the transportation interests have not been in a financial position to anticipate any revival of trade, and this will make the car question a serious one later. These elements are going to be the controlling factors in the coal markets during the next several months, and prices are certain to show sharp rises. The retail dealer who is prepared for a shortage will undoubtedly reap advantages from these unusual conditions.

※

Efficiency Tests as Sports

Our sports have rarely had any relation to our efficient performance of daily occupations. In fact, some will say they should not be so related and that the very thought of wedding sport with utility should perish. But after all, the evil of the association depends upon the point of view. It is dangerous to make our sports heavy with drudgery—very true!—but perhaps it is well to lighten our daily labors with the elements of sport.

If work is bending daily to an undesirable task, then 8 hr. is too long and 6 days too many in which to work, and long vacations are needed. If we are going to be wage slaves, the shorter our servitude the better; but if the day's work is for humanity or for the love of doing—for the keen joy of molding a result—then is labor pleasure and the day no longer than it is happy.

Wearisome work it is trudging along the country road, but joyous is "hiking," because hiking is a sport, while trudging is a duty. They can have discipline who will; for us the joy of doing is better.

They say that the people of these United States talk shop far more than do Europeans. They do, as anyone can verify if he will, but it is because the love of their work puts wings on their leaden feet and makes all their labors pleasures. And so shop comes naturally, as may also come efficiency. So long as efficiency—the art of securing a result without any unnecessary labor—replaces an effort of the body only by imposing a burden on the will, it will never be a success.

But success will come if we make efficient action into a sport, a thing of joy to carry into our holidays. There is no lack of examples in the past—the archer competing at the target, the soldier at the rifle butts, the blacksmith in a shoeing contest, the Australian and Wyoming experts in a sheep-shearing competition, the Western cowpuncher broncho-busting at a fair, and the confectioner engaging in a pie-baking contest.

Sports and efficiency are closely akin and not opposing ideas, as some believe. For it was from the racetrack that the efficiency experts took the stop-watch and from the recreation field the pedometer.

In what department of activity has the art of successful action been more exploited than in sports? Nowhere has the time of action been more closely recorded. Here the first photographs were taken to discover the mechanism of fast motion—to be more explicit to discover just how a horse maneuvered his feet in a trot.

Here also we find a dozen men at work with a bleacherful of critics, friendly and adverse, discussing, criticizing, denouncing their every motion. No men were ever more closely watched at their work. So also the manner of hitting in baseball has been analyzed, and the various methods of delivery. Books have been written on it and the pages of newspapers have been filled with it, and the mechanics of the curved and the spit balls has been learnedly discussed.

But of the manliest sport of all—the best because the most fruitful, the worthiest because the most universal—for this till recently there has been little of either stop watches or technique.

We blunder on to the best ways and weights in shoveling, and each for ourselves we learn how to perform the motions connected with rope splicing or carpentry. Perhaps after awhile we will put into the common round some of that keen analysis and that readiness to submit to inquiry which we already have introduced into exercises which profit little or nothing.

First-aid contests are efficiency sports, and so was the shoveling competition at the recent field day of the Colorado Fuel and Iron Co. In a social outing of the Lehigh Valley Coal Co. there were contests between miners in erecting a set of 8-in. timber, in splicing ropes and belting and in guessing the percentage of carbon in a sample of coal. Some day we will all be subjected to such tests of skill.

The editors will be writing their illuminating discourses in a one-man event with a time limit on completion, a line limit on length and a subject limit on discussion. Then even the work they have to do will be a joyance unquestionable.

By the way, the results obtained at the Lehigh Valley meet are worthy of record and the winners deserving of commemoration. August Van Blargen and Edward Dunney erected a timber set in 7 min. 34 sec. Al. Openhaus and Edward Kessler won the belt-splicing competition. An 18-ft. splice was put in a wire rope by Henry Thomas, Tim Davis, Joseph Michaels and Esther Evans in 11 min. 5 sec. John Lloyd, R. A. Marshall and Harry McClellan tied in the estimation of carbon, and Thomas McLoughlin gave an exhibition of hemp-rope repairing.

Work is not labor till sorrow goes with it, and when our minds are bent to work and our bodies inured to it, we shall find that no work is labor, so long as we are well, if only we restrict our working hours within lengths that are healthful. And pleasure in our work will always be far more effective than discipline.

⁂

New York Coal Specifications

Next week's *Coal Age* will contain an important discussion of the New York coal specifications by some of the leading members of the New York coal trade. The new specifications have come in for some more or less severe criticism, and since more coal will be handled on these than probably on any other like proposals in this country, the matter of formulating uniformly fair and practical specifications in this case is a matter of more than purely local interest. Moreover the new requirements are likely to be established as a precedent.

⁂

Prophylactic Treatment for Contagious Misbeliefs?

The freedom of the press in covers or without covers—in books or in newspapers—is a sacred order of things. It would not be well to restrain anyone from plain utterance of what he believes; but without pretending that the matter has been given the due thought such a pronouncement merits, might it not be permissible to suggest that all books, especially books of science, be submitted to some scrutinizing eye before publication, so that the would-be writer might be protected from error by his due admonishment as to what constitutes recognized truth; might also be in part defended from those savage individuals known as book reviewers who delight in straightening out erratic writers?

Surely by some such provision a lot of misapprehension might be saved from going abroad; for most of the inaccuracies which parade in open day would never have dared to fare forth in the light if some recognized authority had labeled them myths and fallacies before the public saw them and before the author committed himself irrevocably to them. Do not think for a moment that it is suggested that books be placed on an *index expurgatorius* or that no book be published till some frowsy-headed professor has written *nihil obstat* on the covers. The idea is rather that every book should be subjected to inspection and be reviewed before publication, so that the writer might be saved from mistakes.

This matter has not been duly placed before the associated book reviewers of America. It can easily be foreseen that they would condemn it unless they saw a chance to obtain a place on the prenatal book censorship. For when books are all good, the work of the reviewer is gone. Like the lawyer and the doctor who thrive on the crooked deal and the diseased body respectively, the reviewer does his best work where the volume to be described most sadly fails. But this selfish creature must not be allowed to hinder a worthy movement.

There is a class of books already which make deadly reviewing. They are issued by large publishing houses, and these corporations will not publish a book unless the author is considered competent. Moreover, the editor of the establishment exercises care, and the more obvious errors cannot find way into print. In this way the reader is protected and the reviewer disarmed. Now if only every individual with a burning desire to write had a faithful friend like the editor of a publishing house or his assistant to lead him gently from the pitfalls toward which his bleary eyesight leads him, how much better it would be for reader and author and how barren it would be for the reviewer!

⁂

Proportional Wage Increases

The agreement between the miners and the Colorado Fuel and Iron Co. about to be signed contains many excellent clauses. Among the best items is that part of the last clause which says, "If prior to Jan. 1, 1918, a general increase shall be granted in competitive districts in which the company does not conduct operations, a proportional increase shall be made" [in the schedule of wages].

This seeks admirably to meet and satisfy a difficulty before it arises, and its inclusion among the provisions is an element of real statesmanship which is only too infrequent in labor agreements. However, it would have been better had it been differently worded, and confidence may be expressed that the document will be later rectified.

Equal proportional increases are only fair between two or more districts when the wages in both or all are equal. The difficulty is not strongly marked between Colorado and adjacent states because wages are more nearly equal than among some other states and parts of states elsewhere competing, but in any event rises should not be by percentages but by cents per ton or hour.

Only when this becomes customary will the balance of power between districts be maintained. Otherwise the regions paying the larger wage will be faced by a progressive discrimination. If one district pays twice as much for labor as another, after an increase of 10 per cent. which makes, say, a difference of 10c. per ton to the region giving the larger wage, the district paying the lower rate gains an advantage of 5c. and can probably cut the more generous region out of part of its trade.

This is not just, and it really is not necessary. Let the operators this coming year make a specific raise and not an *ad valorem* increase in the rate for each form of mining. Let this be the same everywhere whether in West Virginia, Pennsylvania, Colorado or Montana. It is bad enough to face unequal rates; it is worse yet when an inequality once granted is made larger year by year. This latter condition seems now to be universally conceded, if not in principle at least in general practice.

The continued increased cost of living is going to make it necessary and just to increase wages frequently. We may easily see wages doubled in the next quarter century and the working man not a bit better off. But the change will tend to react against the states now paying the higher rates if by any means they could be made to stand it without an early bankruptcy. Suppose a rate of 26c. per ton in one state and one of 47c. per ton in another. These are doubled by inevitable economic action to 52c. per ton and 94c. The differential is now not 21c., but 42c., and a most inequitable condition has arisen.

Strange it is that this condition has not been generally understood. If it had been, the states paying the larger wage would have demanded specific raises and insisted that similar specific increases be placed on the labor bills of other states.

Sociological Department

First-Aid Meet of Susquehanna and Lytle Coal Companies

SYNOPSIS—The meet held by the Susquehanna and Lytle coal companies is marked by the warmth of its social feeling, by the assistance it gives to safety propaganda and by the originality and excellence of its first-aid work.

The first-aid meet of the Susquehanna and Lytle coal companies has an individuality of its own. It has the character of a family gathering, though only a few ladies are present. By some this social spirit is explained sufficiently by the fact that the employees of the Susquehanna Coal Co. have for the most part been with that company for a number of years, but probably this good-feeling may be better explained by saying it arises out of the same spirit which has kept so many men from transferring their allegiance from one company to another for so many years.

FIG. 1. FIELD AT SUSQUEHANNA MEET BEFORE 52 TEAMS AND THEIR 329 CONTESTANTS TOOK THEIR PLACES

One of the older employees who dug coal at the breast is Morris Williams, the president, and there is a large number of other men older by far than he who never received a pay envelope from any other company. However, the first-aid men are mostly young, and therefore the spirit animating the contestants must come less from long association than from a sentiment that the Susquehanna Coal Co. is directed by officials who have the interests of the men at heart.

Efficiency Which Does Not Effect Happiness Is Misnamed

And the estimate of the miners is not wrong, for no one could have a keener interest in their welfare than Morris Williams, R. A. Quin, General Daugherty and Charlie Gloman. And what is more, the officials do not fail to exhibit their genial comradeship, which is as important as to feel it. There are executives aplenty with a kindly disposition and a forbidding air who seem to care for nothing but efficiency. After all, efficiency is of little value unless it effects our happiness, and somehow these otherwise excellent executives do not appear to have just that particular kind of efficiency in view.

The Susquehanna and Lytle coal companies' meet was held at Edgewood Park, near Shamokin, Sept. 25, and special trains were run from various points to gather up the contestants scattered about the anthracite region. Despite the fact that the men come from widely remote sections of the anthracite field, the meet nevertheless resembled a reunion.

One of the interesting features was the number of boys' teams—breaker boys from No. 5 Nanticoke, No. 7 Nanticoke, No. 6 Glen Lyon, Hickory Ridge colliery, Shamokin; Pennsylvania colliery, Mt. Carmel; Lykens, Williamstown and Minersville. Thus there were eight teams in all. The boys took part in the same events as the men except in the full-team event, and their marking was uniformly high. They received the greater part of the applause, and well they deserved it as their work was most creditable.

Some of the Safety Mottoes Exhibited

The Susquehanna and Lytle coal companies had this year, as last, an exhibit of safety methods. Many of the legends on the display cards exhibited were extremely valuable, and it may be well to repeat them here:

> The best safety device is a careful man.
>
> It is better to be always careful than always a cripple.
>
> Lodge men should boost for safety. Every lodge man is pledged to protect his fellow lodge man and to look after his wife and children if he is killed. Isn't it a more sane and fraternal act to prevent a brother from being injured than to buy flowers for his funeral and give charity to his family after he is gone? Think this over and join the safety campaign.
>
> You need two eyes. It is a common sight to see a man take a match and a soiled handkerchief and dig a particle of steel out of the eye of another man. Think of exposing one of the most delicate and valuable organs of the body to the microbes which infest the handkerchief. There is always danger of infecting the eye, and blindness may result. Your eyes are the most valuable asset you have. Treat them decently.

Beside these were several blue-printed line drawings showing trucks for use in shaft sinking, a parallel-throw switch for mine tracks and a new method of timbering

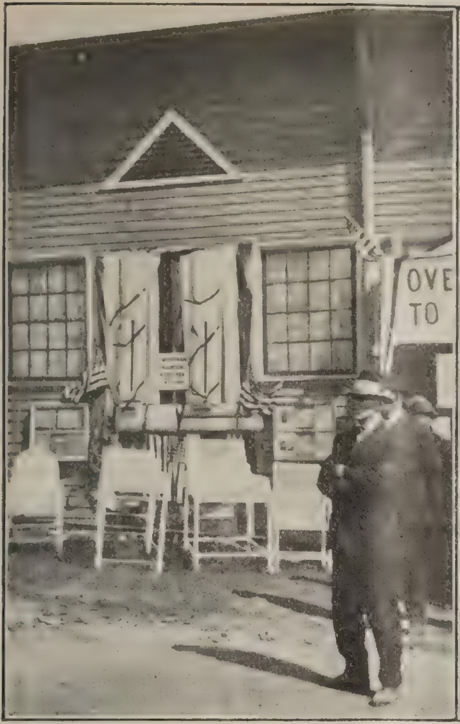


FIG. 2. STRETCHERS FOR PITCHING BREASTS; CHAIRS AND COTS FOR UNDERGROUND HOSPITALS

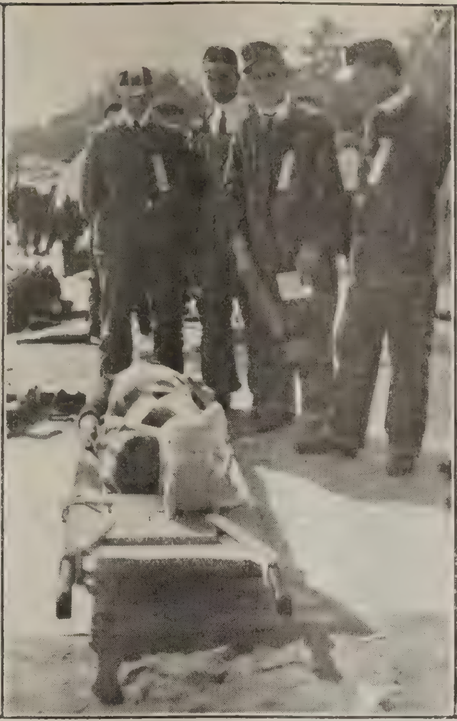


FIG. 3. TREATMENT FOR DISLOCATED HIP, COMPOUND FRACTURE OF LEG AND LACERATED FOOT

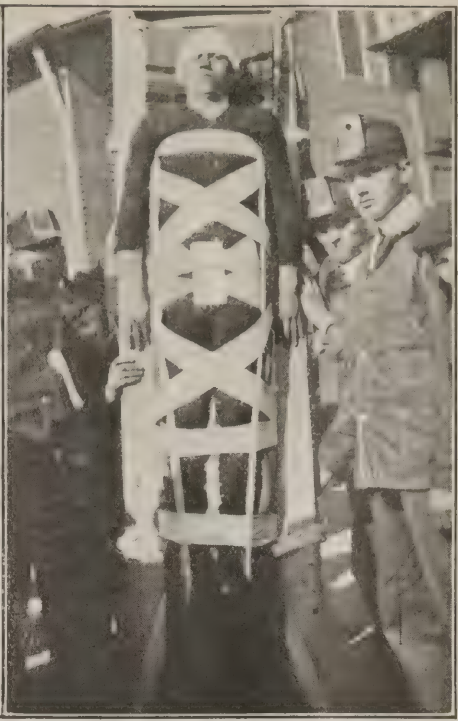


FIG. 4. AN X-BANDAGING FOR PELVIC INJURY DEMONSTRATED BY RICHARDS OUTSIDE TEAM

steep workings which is known as a "man catcher." By means of planks set clear across and entirely over the manway at each "heading," or crosscut, a man when falling down from the breast is prevented from dropping or sliding to the bottom. By this means his life is probably saved. The men can pass around these man catchers when they climb into their places. This system is used with the full battery, the miner standing on the coal when drilling his chamber breast.

Several photographs were also shown exhibiting the changes in methods by which safety is being secured: Mules equipped with Wico lamps, shot firing with a battery, locking device for cage fans or keeps, safety doors over a shaft which is being sunk and many other like devices. There were also several iron cots made from screen cloth and used in the underground emergency hospitals and stretchers devised for handling men in heavily pitching seams. These were provided with a hook at the upper end and straps by which the injured man could be firmly secured in place.

Especially interesting were the views of the gardens of the workmen. The movement has not been encouraged by the Susquehanna by the award of prizes. The self-esteem of the Susquehanna men has always been

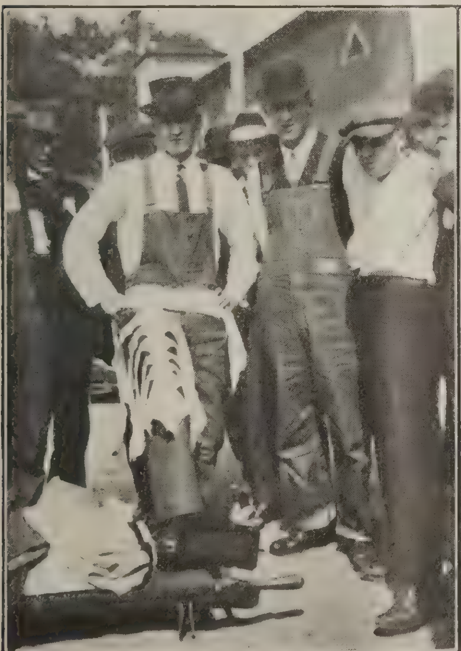


FIG. 5. SAM THOMAS OF PENNSYLVANIA INSIDE TEAM DEMONSTRATING THE SLIT BANDAGE

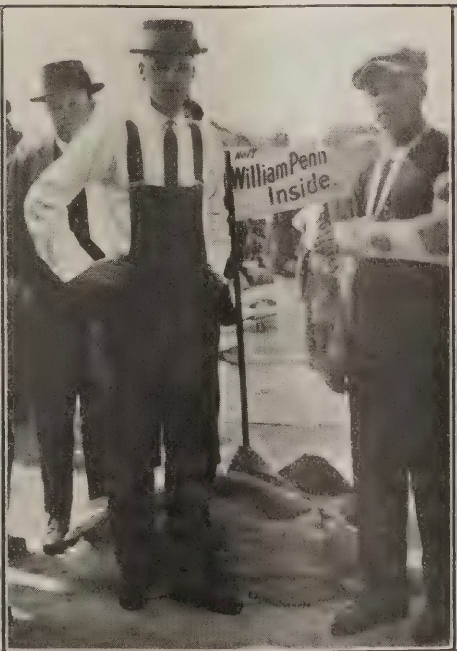


FIG. 6. DRESSING OF FRACTURED FOREARM WITH SLIT BANDAGE SHOWN IN FIG. 5

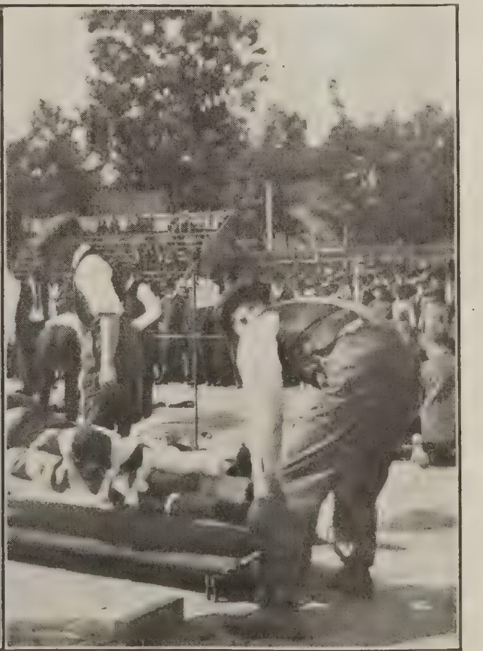


FIG. 7. ANOTHER TEAM'S TREATMENT OF SAME PROBLEM AS ILLUSTRATED IN FIG. 3

enough to carry the movement along. The company engages a most capable photographer to take large pictures of the gardens, and these photographs are given to the tenant of the lot and he keeps them in remembrance of his success long after a $10 or $5 bill, had he received it, would have been spent and forgotten.

Problems in the First-Aid Contest

The morning events were as follows:

One-Man Event—After a premature blast, a man is found with both eyes filled with dirt and a wound on the chin. Lead to a place of safety and dress injuries. Time, 5 min.

Two-Man Event—Simple fracture of the fifth and sixth ribs, right side; laceration of all the fingers of the left hand. Use roller bandages for the fingers only. Time, 12 min.

FIG. 8. GLEN LYON BREAKER BOYS' TEAM

Three-Man Event—Compound fracture of the middle third of left arm, simple fracture of same forearm and compound fracture of the middle third of right thigh. Time, 15 min.

Special One-Man Event—Best original adaptation of one or two triangular bandages for any purpose whatsoever.

The special event introduced many new dressings. William Penn inside team, for instance, exhibited a dressing for a fracture of the forearm using only one triangular bandage. The triangle was slashed on each side by seven cuts parallel with its base. These were extended till they nearly met along the median line of the triangle. The slashes, however, left an undivided midrib to the bandage, as shown in the illustration. This was about 2 in. wide. The seven ends of one edge of the triangle passed around the splints, and being tied to the seven ends opposing them, secured the broken arm of the injured man. The work was rapid and neat and occasioned much favorable comment.

Full-Team Events Are Held in Afternoon

After a splendid lunch served under the trees in the park the full-team event was contested. This was as follows:

Men's Full-Team Event—Compound fracture of the left leg; dislocation of the right hip, laceration of the sole of the right foot, bleeding in spurts. Time 20 min.

Boys' Full-Team Event—Fracture of the pelvis: with lacerated wounds of the side of the head, bleeding in spurts. Time 12 min.

Two illustrations, Figs. 3 and 7, are shown of the first-mentioned event, which was performed concurrently with the second. The fractured leg will be noticed carefully "pillowed" on a blanket and lying just in position in which it was found. The slotted boards lying on the stretcher will also be noted in one of the illustrations. Bandages are passed through the slots and they are then firmly secured around the handles and to the cleats at the side. As a result the patient is most securely attached to the stretcher, and the men could hardly be more effectually prevented from sliding were they slung from the stretchers exhibited by the company and reproduced on the accompanying illustration. The stretcher bearers—boys and men—"looped the loop" with their "victims" without loosening the bandages.

The Richards outside team from Mt. Carmel, Penn., had hoped to get the event which was apportioned to the boys, for they felt they had an X-bandaging for the pelvic injury they would like the *Coal Age* readers to see. So when all the events were over, Dr. J. M. Maurer consented to their dressing this fracture, with the result illustrated. The work was certainly admirable in every way—as good and as professionally sound as it looks in the illustration. All knots which could press on the body and injure by constant pressure were padded, and where the bandages crossed on the chest a heavy pad was placed to relieve that pressure. It was perhaps unfair to photograph the men in this event, because all the breaker boys' teams in the regular contest did the work so admirably.

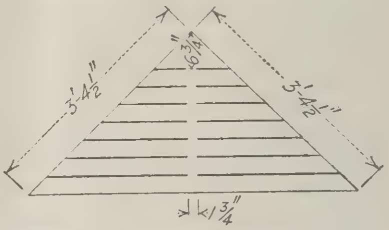


FIG. 9. SINGLE TRIANGULAR BANDAGE SLIT FOR USE IN BANDAGING FOREARM

Perhaps the principal improvement in the first-aid work was in the execution of it rather than in the final result—the "how" which is as important in every way as the "what." A man may be well bandaged, but how much good results if he has expired the while from shock which might have been avoided, or what if the fracture he had sustained had been made worse by careless action, or what if his spine had received an unnecessary twist? This part seems to be more emphasized now than ever, and the Susquehanna men and boys were just as careful in doing what the judges were not able to see as in performing the parts of the work to which the judges could give their attention when they made their rounds for examination.

FIG. 10. LUKE FIDLER AMBULANCE

They do not push bandages by hand under the prone victim, but use a paddle so that he is but little disturbed by the action. Where it is necessary to draw out the tongue they grasp it with an ordinary music clasp, built like a blueprint clamp but lighter. The pressure of this can be regulated at pleasure. Attached to this is a plummet. This holds the tongue out, and a little stick with a Y-shaped cut on top and bottom is thrust between the teeth to keep the mouth open and protect the protruding tongue.

After a parade came the speech-making, which was editorially treated last week, though nothing was said of the address of Henry A. Fuller, president judge of the Luzerne County Court at Wilkes-Barre. It was extremely witty and entertaining and pleased everyone. However, Judge Fuller undertook to contrast the war in Europe with the first-aid, mine-safety and compensation here to the disadvantage of Europe and our own private exaltation. Our present peace and noble ameliorative work are comforting reflections truly, but when we think that the three things Judge Fuller commented on arose abroad—in England and Germany—and that we ourselves have had wars which we are quite willing to believe showed a creditable spirit, such self-complacency seems at best hyprocritical and quite out of keeping with our national spirit of fairness.

Roster of the Victors in the First-Aid Contest

The winners of the one-man event were the outside team of No. 1 Pennsylvania colliery first and that of No. 2 Hickory Ridge second. The inside team of Hickory Ridge took first place in the two-man event, and the outside team of William Penn colliery took second place. In the three-man event the outside team of Hickory Ridge was first, and Nanticoke No. 7, No. 1 North shaft, was second. In the special one-man event Nanticoke No. 5, No. 4 slope, was first, and Pennsylvania colliery outside team was second.

The full-team event went to Hickory Ridge outside team, with Pennsylvania colliery slopes Nos. 1 and 5 second. The breaker boys at Pennsylvania colliery took first place, and the Hickory Ridge breaker boys came second. Hickory Ridge had only three teams, but they took three first places and two second, and none of the three teams failed to receive honors.

The winners of the full-team event—Hickory Ridge, outside team—were P. H. Maginnis, captain; Charles Williams, John Ginter, Peter Aleria, Joe Stanshock, Henry Willard and Dave Little, subject. This team was awarded a silver cup and gold watch fobs. The members of the team of Pennsylvania colliery, slopes Nos. 1 and 5, were William Matthews, captain; Ralph Kendter, Anthony Zigray, Andrew Sadusky, Felix Pfeifer, Joseph Graff and Albert Evans, subject. The breaker boys in the Pennsylvania colliery team which took first prize were Methuen Watkins, captain; Bernard Moleski, Edward Purcell, William Hovenstine, Gerald Wolfgang and Robert Penman, subject. The boys in the Hickory Ridge team were Patrick Feori, captain; Russel Tasker, August Little, Lewis Lish, Frank Alerio and Michael Spock, subject.

The judges were Dr. J. B. Rodgers, of Pottsville, Dr. D. H. Lake, of Kingston, and Dr. James W. Geist, of Wilkes-Barre. Dr. J. M. Maurer was the surgeon in charge of the field and as usual handled the work most successfully. Charles K. Gloman, secretary of the Susquehanna Coal Co., had charge of all the arrangements. The Elmore band supplied the music. John Dorsey, 11 years old, who is a member of that organization, played an admirable cornet solo and received liberal applause. The Susquehanna Coal Co. Glee Club was present with a piano and, led by Prof. K. I. Hopwood, gave several excellently rendered selections.

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Western Fuel Co.'s Picnic

The Western Fuel Co., of Nanaimo, Vancouver Island, B. C., held a picnic at Departure Bay on Aug. 12. The weather was all that could be desired, and the surface and underground employees put forth every effort to make the excursionists happy. The committee in charge can justly feel proud, for over 2,000 persons attended, and every one voted the event a great success.

For this reason it is proposed to repeat it annually. Such days of social intercourse between employer and employee do much to make both approach their inevitable differences in a more friendly spirit. Not only the employees' committee, but the underground manager, the superintendent, and the general manager, T. R. Stockett, spared no effort to make the day pleasant.

LOADING THE FERRY FOR ADVENTURE BAY

DR. McLENNAN ADDRESSING THE CROWD

The company's new ferry and several launches carried the passengers to the scene of merriment at Departure Bay, a distance of 4 mi. Ice cream, soft drinks, oranges and peanuts were provided in abundance. In the afternoon sports were held and valuable prizes awarded for each event.

Probably the most interesting item on the program was the first-aid contest, which was won by J. W. Jemson. The single event was: Run 100 yd.; treat a patient for fractured jaw, scalp wound and crushed hand; lift patient by fireman's lift and carry back to starting point.

Another interesting and keenly contested competition was the tug-of-war between the tophands and underground men. After several animated pulls the underground employees were awarded the prize. During the day a number of selections were rendered by the Piper's Band and members of the Silver Cornet Band. Speeches were also delivered by A. E. Planta, the mayor of Nanaimo; T. R. Stockett, general manager for the Western Fuel Co.; A. S. Hamilton, and Rev. Dr. McLennan. In the course of Manager Stockett's remarks he promised for his company to give dollar for dollar or gun for gun for every dollar or gun that the employees subscribed toward the Canadian Gun Fund.

Discussion by Readers

Efficient Mine Foremen

Letter No. 4—Mining is considered one of the most hazardous of occupations, and to reduce these hazards to the lowest possible limit, both the State and Federal Governments have assumed to exercise authority over the operation of mines, to the extent of enacting laws that, if enforced, will increase the safety of mine workers. These laws require the periodic inspection of mine workings and mine equipment by competent men commissioned by the state for that purpose.

The enactment of laws or the making of rules and regulations assumes the authorizing of persons whose duty it shall be to see that such laws, rules and regulations are strictly enforced, and the responsibility for the safety of workmen then properly rests on such authorized persons.

In considering where responsibility for the safe operation of a mine rightly rests we must first look to the mine superintendent. The law recognizes his authority by making him responsible for the employment of a practical and competent mine foreman who is to have full charge of the underground operations. Then, in order to fix a standard of competency for candidates for that position, the law requires that a mine foreman shall hold a certificate issued by the state to persons who fulfill the requirements of the law and pass an examination in respect to their knowledge and experience in the operation of mines. These are the general requirements relating to safety in mining.

The laws of most coal-producing states specify in detail the actual duties of the mine foreman and require that he shall devote his entire time to the operation of the mine in his charge. In most cases the mine foreman is made personally responsible by law for all matters pertaining to the safety of the men in his charge. The question has been raised as to whether the mine superintendent should not also hold a certificate of competency. While this would undoubtedly prove an advantage in the operation of the mine, it does not seem to me necessary to make it a requirement of the law wherever the act holds the mine foreman responsible for the safety of the operations underground. In my opinion it is not a good plan to make two men responsible for the same thing. The better plan is to make the mine superintendent responsible for employing a competent foreman, and then hold the foreman responsible for the safe operation of the mine, by specifying in detail what are his legal duties in the operation of the mine.

Let me now ask, What makes an efficient mine foreman, and how much should he know? There is scarcely a position in any industry where so many lives depend on one man's conscientious attention to duty, as well as on his practical and theoretical knowledge of the conditions relating to his work. Any man may do the best he knows how, but if he permits a danger to exist by reason of his ignorance of conditions, the result will prove fully as fatal as though he neglected a known duty.

The increased application of modern methods and equipment in mining and the greater development of the mine increase, in the same ratio, the required standard of proficiency, and it is necessary to consider these increased requirements in determining the competency of men capable of taking charge of the work. I would like to ask further, What is to be understood by the term "practical experience"? Many seem to think that this term relates only to the actual performance of work for a certain time in the mining of coal, without respect to the extent of the man's knowledge and his degree of efficiency as a workman. I know some old mine foremen who went to Pittsburgh to observe the experiments performed by the Bureau of Mines and learn that coal dust would explode without the presence of gas, before they would believe that to be possible.

To my mind the most practical man is the man who combines in his experience both years of work and of study. His years of work in mines will make him a judge of what he reads and studies. It is unfortunate that there is much in mining books that must be culled, the good from the bad. But reading and study keep a man posted and well informed on mining conditions and make him a more competent and efficient foreman, whose services will prove increasingly valuable to the company as time passes.

A mine foreman should consider that he must continue to study after he has secured his certificate. We must all admit that there is much to be learned that as yet we do not know. An efficient mine foreman will recognize that any amount of law or inspection cannot keep a mine safe. For this reason the foreman has a much greater responsibility resting on him than simply to keep the letter of the law. He knows that "a chain is only as strong as its weakest link," and one careless man in a mine may jeopardize the lives of every one underground. The foreman must be able to detect this weak link.

If a foreman finds a man who will not exercise the necessary care and precaution, he must discipline him. It is not enough to remind him of the law and expect his compliance therewith. When a foreman discovers a piece of bad top in a man's place, it is not enough to tell him to set a post under it, but he must adopt measures that will induce the man to carry out his orders promptly. This can only be done by discipline for failure. Strict mine discipline is the greatest factor in averting mine accidents.

Human fallibility and human carelessness make accidents possible at all times, and an efficient mine foreman will always consider these elements. It is more important to keep the mine free of dust and in such condition that a possible local explosion of gas will not be propagated throughout the mine, than to devote one's whole energies to the prevention of windy and blownout shots. It is better to keep sufficient air in circulation at the working face to prevent an accumulation of gas, than to rely on men not passing over a danger board and igniting the gas with their open lamps. It is better to set the necessary post promptly, than to continue to load coal and hope to dodge the loose piece of slate when it falls. At the same time, the windy or blownout shot, the danger board or signal and the need of watching the roof must not be neglected. In respect to safety, these are the chief essentials of an efficient foreman. Besides these, however, the efficient foreman must be able to get out the coal systematically and without waste of coal or danger to the workmen. I have confined my remarks to the safe operation of the mine.

George Stockdale.

Mt. Braddock, Penn.

Letter No. 5—In connection with the discussion of what makes an efficient mine foreman, I have been wondering whether it always pays for the foreman to speak the truth when questioned by the superintendent or manager in regard to conditions in the mine or occurrences that take place in its daily operation.

I recall one little incident that convinces me that it always pays a mine foreman to speak the exact truth and explain matters as they are or as they occur in the mine. The case to which I refer was one in which there had been heavy rains and surface water had found its way into the mine, so that it was necessary to discontinue work in certain places. As a natural result the general manager became very anxious to know the exact condition and, going into the mine, he put up a mark showing the water level, and gave orders that this should be measured night and morning.

It was my duty to take the measurement every night, and on going into the office one night after having measured the water, I found the manager and foreman in the office. The first question the manager asked was, "How much has the water gone down tonight?" I replied, "Two inches." The manager at once jumped on me, claiming that I had never measured the water, as the foreman had just told him that it had gone down 6 in. below the mark.

Naturally, I did not want to get the boss into trouble, but felt sure that he had made this statement as a guess at what he thought the water ought to have been lowered. I did not believe that he could have measured the water himself. Realizing that he had more to lose than myself, I stated: "Perhaps I have made a mistake in the measurement." As might be expected, such a reply did not give me much standing in the eyes of the manager, but my own conscience was free. The incident impressed me with the thought that if I ever became a mine foreman I would speak the truth. I believe that a mine foreman should always be able to give an intelligent answer in regard to conditions in any part of the mine—certainly this is true of every efficient foreman.

My observations during many years of coal-mining experience lead me to conclude that the trouble with most mine foremen is that they spend too much time in one place. Then if the superintendent or manager inquires about a place they have not reached in their rounds, they do not like to acknowledge that they have not seen the place, but make a shrewd guess and depend on having the assistant foreman put in a couple of men at once in such a place and see that it is put in the shape that he has described.

Instead of such a condition of affairs, I think there should be the best of understanding in the world between the mine foreman and his superintendent. When this is the case the foreman will not dread the superintendent's visit to the mine or strive to avoid his going into certain places while he is underground. A foreman should not hesitate to tell his superintendent of rails that had been covered by a fall, since it is necessary that such material be accounted for in the monthly report.

One thing a mine foreman should remember is that he is not infallible. Some of his schemes, no doubt, will not work out as he expected. Then what is the use of telling the superintendent, "Everything is working fine," when in reality the foreman is spending the company's money in a fruitless endeavor to work out his scheme and prove that he was not mistaken in his ideas? At such a time a dishonest mine foreman will frequently report the expense on other items. Since the superintendent does not have the opportunity to personally observe what is going on in the mine, it is important that he should have a mine foreman on whose word he can depend, and this sort of man, I believe, will make the most efficient foreman in the end.

Thomas Hogarth.

Burgettstown, Penn.

Letter No. 6—I have been much interested in the discussion of Efficient Mine Foremen, and would like to refer to a few points that appeal to me as going to make up an efficient foreman in coal mining. I will refer to these briefly, as follows:

It must be clear to the close observer that the mine foreman holds a most important position as an intermediary between two conflicting interests engaged in the mining of coal. Also, as a result of these conflicts, there is produced much suffering on the part of the general public. Standing as he does, the mine foreman is in a position to minimize the differences that are wont to arise between miners and their employers. By virtue of his position, the foreman if broadminded can see at a glance both sides of the question in controversy. His daily touch with both the miners and the operators informs him of any approaching disagreement or trouble, and if he is a man of judgment, he can generally bring both sides to a reasonable understanding of their individual rights and destroy that prejudice which so frequently exists in the minds of parties whose interests are in conflict.

The mine foreman must always hold sacred the rights of the miner to a sanitary condition of the mine workings in which he is employed and to the equipment of the mine with all necessary safety appliances designed to reduce the frequency of mine accidents of every nature. The mine worker has a right to fresh air and good drainage in the mine, so far as this is practicable. On the other hand, the operator has the right to expect the highest efficiency in the workmen employed and a maximum of economy and minimum of loss in the operation of the mine.

The general public also has unquestioned rights dependent on the continuous operation of the mine, the avoidance of strikes or lockouts, and a reasonable market value of the products mined. The intelligent mine foreman must be thoroughly informed in regard to and consider all the rights of the several parties involved.

I grant that it is often a difficult matter to bring parties in conflict to see each other's rights, but this is the task of the intelligent mine foreman and one that is of the highest importance. He should be possessed of a strong conviction that true rights of individuals never clash. His greatest efforts should be put forth to show both parties that their interests are not antagonistic but common.

In order to do the most efficient work in this connection, the mine foreman must not be one-sided. We speak of educated mine foremen, but if education means anything in this connection it means the ability to see the right of both sides of a controversy. The power to do this does not come from a college education; it is developed by keeping a well-balanced mind that can weigh the arguments on both sides of a question. An unprejudiced mind is developed by mixing freely with all classes of people and gaining their viewpoints as they present them. It is the result of reading and studying a question from an unprejudiced standpoint.

Different people regard the question of education from different standpoints, but in respect to the education of mining men, it must fit them for getting results in the business in which they are engaged. Doubtless, in many minds, the education of a mine foreman suggests his capability to operate the mine and avoid the loss of human life. In the minds of others, it suggests the ability to operate a mine in the most economical manner and reduce the cost of the production of coal. While I have not investigated the causes of mine catastrophes that have shocked the world, I strongly suspect that a large percentage of these accidents might have been prevented had the mine foremen in charge possessed the intelligence and experience that would have enabled them to form an accurate knowledge of the conditions existing in the mine and their effects.

I concede readily that the chief cause of mine accidents in the United States is to be found in the carelessness and ignorance of the miners themselves. In view of this fact, the responsibility of the mine foreman is greatly increased. A person fitted for this position must therefore be a good judge of human nature, possessed of tact and of a practical turn of mind. He must be thoroughly posted in the requirements of the state mining laws. He must be firm in maintaining the discipline of the mine. His technical education, whether derived from reading and studying or from attending schools, should include a thorough knowledge of the elements of mathematics and physics. Although the latter term may frighten many men, the laws of physics are simple natural laws that control the ventilation of the mines, the accumulation of gases, the rise and fall of the barometer, the initiation of a gas or dust explosion and many other things connected with the operation of the mines.

An efficient mine foreman must also possess a knowledge of the human frame and anatomy. He should know the exact position of the vital organs of the body and be acquainted with first-aid and rescue work, including the use of rescue appliances. He should have a sufficient knowledge of the origin and formation of coal and the structure of rocks to guide him intelligently in the extraction of the coal from the seam. His experience must be such as to acquaint him fully in regard to the preparation of shots in blasting coal and rock, timbering airways and working places to make them safe, the fighting of mine fires and the operation of different haulage systems underground.

Although these are only a few of the things that a mine foreman should know, some will say that I expect too much of the man in this position, claiming that he often works for less wages than the miner at the face. In reply to this assertion, I will say that mine operators can well afford to pay good salaries for well-informed mine foremen. I recently heard a mine operator remark that his company would be glad to pay a foreman who was educated in the manner I have described a salary of $2,000 per year. Operators know better than anyone else that intelligent labor pays, and they are willing to pay the price for such efficiency.

MINE FOREMAN.

Percy, Penn.

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Egyptian State Ry. Specifications

Letter No. 2—The points made by F. R. Wadleigh in his letter, *Coal Age,* Oct. 2, p. 559, against the editorial of Aug. 28, p. 344, do not seem to be particularly well taken nor are they such as would ordinarily occur to a reader conversant with the coal trade.

The strike clause, for example, does not seem to be less rigid because it "allows an extension of time for deliveries." Had an American shipper entered into such a contract for the period Apr. 1, 1915, to Apr. 1, 1916, and were he confronted now with a strike or other unforeseen contingency, he would be required to make good his tonnage after Apr. 1, 1916, during a period when conceivably the cost of mining might well be much increased. Of course there could be no cancellation until after "an actual suspension of shipments," were there any equity in the case; but another clause points out that rejection is to constitute nondelivery.

That brings us to "the judgment of the buyer." The evidence of strike or other contingency has to be "satisfactory," and as Mr. Wadleigh says, Egypt is a long way off. Deliveries are to be "as per the following tables at the option of the administration"; and subject to 30 per cent. increases. Deductions, etc., are to be decided by the administration; and as already mentioned, rejection on the point of quality would constitute nondelivery. With American coals so generally friable and so much complained of in Europe for their proportion of slack, it is easy to see that "the inspector" with the weight of the British Government at his back could make the contractor very uncomfortable.

An absolute limit of 40 per cent. for volatile may certainly be considered rather stringent. There are several good locomotive coals that range around 40 per cent. volatile, almost as often above as below. There are any quantity of analyses from the Redstone seam that run 40.5 to 42 per cent. Under these stipulations such a coal would frequently be subjected to rejection. Because 40 per cent. will include everything from the Durham gas-coal field or from the fields shipping via Cardiff, it is simply a case where such contracts should be further modified if American competition is desired. One cannot consider 6-per cent. ash with no penalty up to 8 per cent. as other that an 8-per cent. requirement, and it would be universally so regarded; and it certainly is not an exacting requirement.

The strike clauses, etc., and the requirement as to volatile, however, seem to fully warrant the use of the words "rather drastic."

The remarks on time allowed for loading at Welsh ports were simply "free comment," pointing out the contrast between their handling of coal and ours. The "running hours" are of course figured from the time the vessels are "ready to load." But our steamers would have to get higher freights than they do in ordinary times if 200 hr. were customary loading dispatch for a 7,000-ton ship. Of course we are not discussing abnormal strike periods. The same remarks apply to the 700-ton per day guarantee for discharging, weather permitting, etc. If Americans were sending 8,000-ton ships regularly in usual times, the chances are they would insist on compensation if there were 15 days' detention; that is, they would unless they put their prices at a prohibitive level.

It is true, freight quotations to the Mediterranean are not as high now as when the editorial was written, early in July. But rates to Alexandria would certainly not be much less, were one to speculate on them to May or June, 1916. The one American shipper who positively obtained any share of this business, 60,000 tons, is understood to have bid $14.16 delivered, and this on a coal that sells normally at $2.40 to $2.50, three-quarter screened, f.o.b. Philadelphia.

True, the bidder on the Panama R.R. contract puts up a bond of $30,000, but the check with his bid is only for $1,000 and the tonnage is 500,000 to 600,000. On 60,000 tons the Consolidation Coal Co., according to the stipulations, would be required to put up something like $17,000 with its bid and increase it to $85,000 when the tender is accepted. We do not understand how this can be considered other than "excessive."

We do not understand why there were "many" American shippers bidding. A London house put in a bid on American coal, but there was no award to any Americans except to the Consolidation, and that company has two steamers now just about ready to engage in this business—steamers contracted for before the war. The first of these cleared from Baltimore Sept. 30.

The whole point is that while the conditions on such pieces of business have already been modified somewhat in order to encourage American shippers, the modifications have not yet gone far enough. It was of course generally known that the Consolidation has had some business in Alexandria for a year or two back, but it was experimental by both parties. It was purely a result of those trial shipments that the conditions have been modified as much as they have.

G. G. W.

Boston, Mass.

Study Course in Coal Mining

By J. T. Beard

The Coal Age Pocket Book

LOGARITHMS

The treatment of logarithms here will be simple and practical and such as to enable their use to be clearly understood. Much time and labor are saved when multiplying and dividing, or when extracting the roots of numbers, or raising a number to a given power.

Definition—The logarithm of a number is the exponent of the power to which it is necessary to raise a fixed number called the **"base"** to produce the given number.

Systems of Logarithms—There are two systems of logarithms in use: 1. The Briggs or **common system** employs 10 as a base. 2. The Naperian or hyperbolic or **natural system** is derived from 2.71828+ as a base. The common logarithms (log) are those generally used, while the natural logarithms (nat. log) are often employed in theoretical analyses.

The Naperian or natural logarithm of a number can always be found by multiplying the common logarithm of the number by 2.302585, which is expressed thus:

Nat. log. = 2.302585 *com. log.*

In any system of logarithms, the logarithm of 1 is zero, and the logarithm of the base of the system is always 1.

The Logarithm—Every logarithm is composed of two distinct parts separated by a decimal point. The number preceding the decimal point, or the integer of the logarithm is called the "characteristic," while the decimal portion of the logarithm is the "mantissa." These two parts of a logarithm must be regarded separately. The mantissa is always positive, but the characteristic may be either positive or negative, according as the given number is greater or less than 1, in a system whose base is greater than 1.

The **characteristic** is always 1 less than the number of figures in the integral portion of the given number; or 1 greater than the number of ciphers following the decimal point when the given number is wholly decimal. In the former case the characteristic is positive; in the latter case it is negative. The following examples will make this clear:

log 325.00 = 2.51188 log 0.325 = —1.51188
log 32.50 = 1.51188 log 0.0325 = —2.51188
log 3.25 = 0.51188 log 0.00325 = —3.51188

The **mantissa**, as is readily observed from the above examples, is determined by the sensible figures of a number, without regard to the decimal point. Also, the mantissa of the logarithm of a number is unchanged when the number is multiplied or divided by 10, 100, 1,000, etc. For example, the mantissa of the logarithm of 3, which is 0.47712, is the same for 30, 300, 3,000 or for 0.3, 0.03, 0.003, etc.

A table of the common logarithms of numbers from 0 to 10,000 will be found in the appendix. In this table the mantissas only are given and, to avoid unnecessary repetition, the first two figures are not repeated, but bars are employed to mark the division The numbers are given in the left-hand column, and the differences, which are used for the purpose of interpolation, are placed on the right

The Coal Age Pocket Book

To Find the Logarithm of a Number—From the table of logarithms, find the mantissa corresponding to the given number, ignoring the decimal point. To do this, the first three figures on the left of the given number are found in the left-hand column of the table, and the fourth figure in the line at the top. The required mantissa is then taken from the line and column thus indicated.

But if the given number contains five or more figures, write the excess figures as a decimal and multiply by the difference found in the right-hand column of the table; point off and add the integral portion of this result to the mantissa already found. If desired this logarithm can be extended by annexing the decimal portion of the same result, but this is not commonly necessary.

Having found the mantissa, prefix a decimal point preceded by a characteristic one less than the number of integral figures in the given number. If there is but one integral figure the characteristic of the logarithm will be zero.

If the given number is a decimal, having no integral figures, the characteristic will be negative and numerically one greater than the number of ciphers that follow the decimal point.

Illustrations—The following examples will illustrate the method of finding the logarithms of numbers under different conditions and make clear the use of the table.

1. Suppose it is required to find the logarithm of the number 4,657. Opposite 465, in the column under 7, is found 811, and this annexed to 66 found at the left gives for the mantissa of this number the decimal 0.66811. The characteristic, in this case, is 3, since there are four integral figures in the given number. Hence, log 4,657 = 3.66811.

2. To find the logarithm of 32.567, ignoring the decimal point, opposite 325, in the column under 6, is found the mantissa 0.51268; but there is still another figure 7 in the given number. Therefore, to complete the mantissa write this as a decimal 0.7 and multiply by the difference 14 found in the right-hand column; thus, 0.7 × 14 = 9.8, or say 10. Then 51,268 + 10 = 51,278 and the complete mantissa is therefore 0.51278. In this case, the given number contains but two integral figures, which makes the characteristic 1; hence, log 32.567 = 1.51278.

3. To find the logarithm of 0.509065, ignoring the decimal point, opposite 509, in the column under 0, is found the mantissa 0.70672. To complete this mantissa multiply the remaining figures of the given number, written as a decimal, by the difference 8 found at the right, and add the integral result to the mantissa already found.

Thus, 70,672 + 0.65 × 8 = 70,672 + 5 = 70,677.

Now, since the given number is a decimal, the characteristic of its logarithm is negative; and its numerical value is 1, as there are no ciphers immediately following the decimal point. The complete logarithm is, therefore, log 0.509065 = —1.70677, which should be written thus $\bar{1}.70677$, since the characteristic only is negative.

Inquiries of General Interest

Formulas for Weight of Air

I have been studying the pamphlet, "Practical Mine Ventilation," and see that the formula given for finding the weight of a cubic foot of air at a temperature t and a barometric pressure B uses the constant 1.3273, instead of the constant used in the old textbooks, 1.3253. I believe that it has been explained in *Coal Age* that this change of constant is due to adopting 460 as the absolute zero of the Fahrenheit scale, instead of 459 used in the old formula. I believe it was stated that these two formulas give practically the same results.

However, I have calculated the weight of 1 cu.ft. of air at a temperature of 60 deg. F. and a barometric pressure of 30 in., and find a little difference. My calculations are as follows:

$$\text{Old formula,}\quad w = \frac{1.3253 \times 30}{459 + 60} = 0.076607\ lb.$$

$$\text{New formula,}\quad w = \frac{1.3273 \times 30}{460 + 60} = 0.076575\ lb.$$

Kindly explain which of these formulas gives the nearer approximation to the correct weight of air.

W. T. Jenkins.

California, Penn.

It will be observed that the results obtained by the correspondent are practically identical to four decimal places. In order to answer the question of which of these results approaches more closely to the actual facts, we must go back to the determinations of the weight of air made by Regnault, which have been generally accepted as the base of scientific calculations. (See "Mine Gases and Explosions," Beard, pp. 75-78.)

The experiments of Regnault showed that 1,000 c.c. of air at a temperature of 0 deg. C. (32 deg. F.) and a barometric pressure of 760 mm. (29.925 in.) weighs 1.293187 grams. Reducing this standard weight of air to pounds per cubic foot, we find that 1 cu.ft. of dry air at a temperature 32 deg. F. and a barometric pressure of 29.925 in. weighs 0.080728 lb.

Now correcting this last result for temperature and pressure, the weight of 1 cu.ft. of dry air at 60 deg. F. and a barometric pressure of 30 in. is

$$w = 0.080728\,\frac{460 + 32}{460 + 60} \times \frac{30}{29.925} = 0.076575\ lb.$$

This shows that the new formula gives the closer approximation to the truth, or the adopted standard of Regnault.

The formula used in steam-engineering practice gives the weight (w) of 1 cu.ft. of dry air at an absolute temperature (T) of the Fahrenheit scale and a pressure (p) in pounds per square inch as

$$w = \frac{p}{0.37\ T}$$

Since the weight of 1 cu.in. of mercury at a standard temperature of 32 deg. F. is 0.4911 lb., it is observed that the constant 0.37 exactly corresponds to the constant 1.3273; thus, 0.4911 ÷ 1.3273 = 0.37.

Weight and Pressure of Gas

Suppose we have a room containing 1,000 cu.ft. of pure marsh gas, having a specific gravity of 0.559. Assume, for the purpose of argument, that this gas is distributed over an area of 100 sq.ft. in the room. Since we have had quite an argument as to what pressure this body of gas would have on the mine roof above it, under the assumed conditions, I would like to ask you to explain what is the weight of this amount of gas and what amount of air weighing 0.0766 lb. per cu.ft., would the gas balance? Also, assuming there was a slip in the roof, forming what the miners call a "pot hole," would the pressure of the gas have a tendency to keep the rock from falling? Please show how to find the lifting power of this gas.

Inquirer.

Enterprise, Iowa.

The question as to the pressure this volume of gas would exert to oppose the tendency of the roof rock to fall cannot be considered a practical question under the assumed conditions. Taking the weight of the gas as 0.0766 lb. per cu.ft., the entire weight of gas assumed is 1,000 × 0.0766 = 76.6 lb. The inquiry assumes that this gas is distributed over an area of 100 sq.ft. of room, which condition makes the vertical depth of the entire volume of gas 1,000 ÷ 100 = 10 ft. Now, assuming a level seam, there is a lack of balance between this 10-ft. head of gas and a 10-ft. column of air. If the conditions were such, practically, that these opposing air columns could be held intact, the excess in weight of 10 cu.ft. of air over 10 cu.ft. of gas would represent a pressure of $10 \times 0.0766\ (1 - 0.559) = \frac{1}{3}$ lb. per sq.ft. exerted against the roof.

However, such cannot be assumed as the practical condition, as the tendency of the gas accumulated in the room is to diffuse into the air with which it is in contact. Actually, the heavier air works under the gas and forces it to flow out of the room along the roof of the mine. There is therefore an inflow of air along the floor and an outflow of gas at the roof of this room. As a fact, under these conditions there is no pressure whatever exerted by the gas in opposition to the tendency of the roof to fall. The natural escape of the gas from the room, as described, prevents it from exerting any pressure against the roof.

In answer to the last question, it may be stated that the lifting power of any volume of gas, as estimated from its specific gravity referred to air as unity, is found by multiplying 1 minus the specific gravity of the gas by the weight of a cubic foot of air, and that product by the volume of the gas in question. The result gives the lifting power of the gas when confined in a body, as in a gas bag.

Examination Questions

Alabama Examination for Mine Foremen, July 26-29, 1915

(*Selected Questions*)

Ques.—If the ventilation of a mine is insufficient, how may it be increased without increasing the power?

Ans.—All airways should be thoroughly cleaned up and every obstruction to the free passage of air removed. Air courses should be straightened, the distance the air must travel shortened and the air current split, wherever it is practicable to make these changes. The splitting of the air current, however, is limited by the velocity of the current, which must always be sufficient to sweep away the gases that would otherwise accumulate at the roof or the face of the headings and in the void places in the mines. All breakthroughs and crosscuts should be enlarged to the full area of the airways, and no obstruction should be permitted in these crosscuts. If practicable, the main airways should be widened so as to reduce the velocity of the air current passing through them to a normal velocity, say not to exceed 12 or 15 ft. per sec., except it may be for short distances in places where the airway cannot be enlarged.

Ques.—When coal is shot off the solid, how should the holes be drilled and what kind of powder should be used?

Ans.—When shooting coal off the solid, the holes should be drilled to such a depth and at such an angle that the line of least resistance will be less than the length of the hole. Also, the line of least resistance should be perpendicular to the hole, at its extreme depth. Again, the hole should frequently be slightly inclined upward or downward, according as the coal shoots harder at the top or the bottom of the seam. Where the coal is seamy or includes soft layers that are easily blown out in blasting, it is important that the hole should be inclined across such measures and the charge located in the harder layers of the seam. In no case should the charge be located too close to the roof or the floor of the seam. Only a normal charge of permissible powder should be used, which must not exceed 1½ lb.

Ques.—Where coal is undercut by machines, is it possible to have a windy or blownout shot? If so, what would be the cause?

Ans.—Windy or blownout shots more often result from insufficient mining or shearing of the coal. When undercutting by machine, it is possible that too much reliance is placed on the fact that the coal is well mined, and for this reason the danger of a blownout or a windy shot is practically eliminated. The miner is also tempted to put in a deeper hole and to locate the shot somewhat beyond the depth of the mining. A hole should never be drilled beyond the depth to which the coal is mined, so that the charge will not be located in the solid formation. When blasting coal mined by machine, it must be remembered that a less weight of powder is required to break down the coal, since the rupture is greatly assisted by gravity. The charge may also be located somewhat higher in the seam than would otherwise be done. If these precautions are not followed, a blownout or a windy shot may result even in machine mining. In such mining, the line of least resistance is measured by the distance between the hole and the mining, at their extreme depths. The weight of the charge must be proportioned to this distance, having due regard to the effect of gravity to break the coal.

Ques.—If two kinds of powder are used in the same hole, what is likely to be the result?

Ans.—The coarser powder will burn more slowly, and as a result a portion will be blown out of the hole while it is still burning, by reason of the quicker combustion and explosion of the finer-grained powder. The mixing of two grades of powder in the same hole is a dangerous practice and liable to produce a windy shot that will frequently result in a more or less local dust explosion, which may develop into a violent mine explosion under favorable conditions in the mine.

Ques.—When firing five shots in the face of a room, with one shot depending on another, what precautions should be taken to prevent a windy shot?

Ans.—The danger in this case is that one or more of the dependent shots may explode out of turn or before the explosion of the shot intended to relieve the one in question. In that event there is almost sure to result a blownout shot. Whenever two or more such shots are to be fired in a mine, each shot should be fired separately, in turn, in the order in which it was intended. In such case great care is needed to prevent the accidental explosion of succeeding shots. Fuse should not be used, and the squibs should not be inserted in any of the succeeding holes until they are reached in turn. The firing of two or more dependent shots in a working place is always attended with considerable risk to the miner or shotfirer, who must return through the smoke of the first shot in order to fire those remaining.

Ques.—How would you handle a failed shot to prevent an accident?

Ans.—It is never safe to attempt to pick out a shot that has failed to explode or has misfired. A great deal of care and judgment is required in handling such a shot. The safest plan is to drill another hole in a position to dislodge the missed shot. In doing this, however, the second hole should be drilled at a sufficient distance from the first to avoid the possibility of that charge being exploded by the drilling of the second hole. It will be well to observe extra precaution in this case to free the shot, by mining or shearing the coal in such a manner that a light charge only is required in the second hole. This is important, inasmuch as the first charge will probably be exploded when the second hole is fired. The two charges together would produce a heavy shot, similar in its effect to that of an overcharged hole. Also, special precaution should be taken to clean up the face before firing the second hole and to remove all accumulations of fine coal and dust that would be blown into the air by the force of the explosion of the two shots.

Coal and Coke News

Washington, D. C.

In filing a petition for the reopening of the Western rate case, the railroads operating west of Chicago have taken an expected step. It had been supposed that the action of the Interstate Commerce Commission in postponing the date when its order in the case would become effective to Dec. 31 meant that some new proceeding was probable, although there was no official announcement to that effect.

Now the case is sought to be reopened, and it remains to be seen what the Commission will say in reply to the roads. It is recalled that over a year ago the 5 per cent. case affecting the Eastern roads was thus reopened and, after rehearing, a new opinion granting some of the roads' demands was handed down.

In this case the argument for rehearing is supposed to be particularly strong, because of the fact that two forcible dissenting opinions were filed by members of the minority of the Commission.

Whatever is done will not affect the rates, including a large number of new coal rates, that were provided for in the original tariffs of the carriers, until at least the first of January next. That amount of delay in the final action is assured by the order of the Commission, already referred to wherein the effective date of the order in the case is put off to the end of the year. The new proceeding leaves the coal rates as they were before the petition was filed.

On the other hand, however, should the petition be granted and the case reopened, the time of the effective date of the order would probably be still further postponed, inasmuch as it would hardly be likely that the rehearing could be had and the present opinion be reviewed before the end of the year. In the event, moreover, that the Commission should hand down a new opinion, the coal interests could be but little more disadvantageously treated than they would be under the present opinion. As will be recalled, the present opinion holds that the advances in rates on bituminous coals except as to South Dakota points have been justified by the roads, the same being true of coke.

This means that, even if the Commission should reopen the case as suggested, and should further incline to greater concessions to the carriers, the only point at which coal interests could be injured would be in connection with the proposed South Dakota rates which might conceivably be upheld. Of course there would be the possibility that the coal interests might succeed in inducing the Commission, in case of such a reopening and revision, to disallow more of the increases in rates, but this does not now seem likely.

New Procedure in Exportation

From and after Jan. 1, 1916, a new procedure will be employed by the Treasury in connection with the exportation of merchandise. The new procedure will require as a prerequisite to the issuance of clearance papers a shipper's export declaration to be filled in by the shipper and filed with the Collector of Customs. The export declaration upon which will be stated the ordinary information regarding the nature, quantity, and value of the goods, the home of the shipper and the destination, etc., must be made under oath taken before a notary and will be retained at the Custom House as confidential. Where the shipper's export declaration has not been received clearance may be granted provided a bond of $500 is given by the master of the vessel to cause the filing of the declaration within 15 days after the date of clearance.

PENNSYLVANIA

Anthracite

Yatesville—The Lehigh Valley R.R. Co.'s mountain cut-off tracks were out of service on Sept. 28, due to a cave-in over the workings of the Pennsylvania Coal Co. The track and ground settled about 3 ft. for a distance of 60 ft. Track walkers discovered the settlement in time to flag all trains. A large force of men were set to work filling in the cavity with ashes and stone.

Hazleton—Properties sought in Butler Valley by the Lehigh Valley Coal Co. to be the outlet of the big 5-mi. drainage tunnel that will tap the water in the Hazleton Basin and do away with pumps have been obtained, and contractors bidding on the job have been notified that the work will be given out during October. It will take about two years to drive the tunnel.

Lansford—The present week has been a season of activity in the anthracite coal business, many of the mines in the upper Lehigh Valley having resumed full time with the coming of the change in the weather.

After having been imprisoned in the Foster Tunnel of the Lehigh Coal & Navigation Co. for six days nine miners were rescued practically unhurt. The men were entombed by a fall of rock and a rush of water following a blast. Two hundred men labored night and day in the rescue work. A cut was made through 300 ft. of solid rock and coal. After having been in the mine four days the men were given up for lost, as it was believed that the water must have reached them. On the sixth day the water was lowered sufficiently to allow one of the rescue corps to go into the opening on a raft. The men were found at the top of a chute. They had lived on the food which one of them had in his dinner pail, but this had all been consumed two days before they were rescued. After resting in the hospital for several days the men have practically recovered.

Scranton—Most of the mines in the anthracite region are now working on full time. All the collieries of the Delaware, Lackawanna & Western Co. are working full, and it is believed that full-time operations will continue for a considerable period. Orders have also been received to start full-time operations in all mines of the Scranton Coal Co., while similar instructions are being put into effect at the Delaware & Hudson mines.

Archbald—Four mine workers were badly burned in a powder explosion at the slope mine of the Archbald Coal Co. recently. These men were burned about the face and body when a spark from a mine lamp ignited a quantity of powder. One man was taken to the Mid Valley Hospital in a serious condition, while the others were removed to their homes.

Bituminous

Sample Run—The Clearfield Bituminous Coal Co., operating mines here, is making improvements. A new air shaft and fan system is being installed and the entire workings are being overhauled. The output of the company will be greatly increased as a result of the improvements.

Windber—Held prisoner for 15 hr. by a mining machine in the Gahagan mine, Thomas McCabe smoked and talked with his rescuers as they burned away the steel of the machine with an oxygen flame. McCabe was about to quit work when in some manner his leg was caught in the machine, and although the flesh was cut to the bone, he was securely held. In the hope of saving his leg, the coal company officials hurried to Johnstown for the necessary apparatus to cut away the steel, and skilled workmen finally released him. He was sent to the hospital, but physicians found that it was necessary to amputate the leg.

Connellsville—Scarcity of labor in the coke region is beginning to be felt by producers, but in the face of this condition some 300 ovens were recently added to the active list. The labor shortage is due to the fact that when the European war came on scores of coke workers were at their homes in Italy and Austria and have not returned. Production and shipment of coke continues at approximately 390,000 tons a week, with a material increase expected shortly.

Rillton—Mine safety car No. 6 of the Bureau of Mines will be at Rillton, Oct. 11, for the purpose of giving demonstrations in mine rescue and first-aid work. The car will remain here until Oct. 23, during which period lectures will be given relating to rescue work. On Oct. 25 the car will go to Jenner to remain until Nov. 20.

MARYLAND

Cumberland—The mines in this section are now working full time and some are employing more men. The Washington mine of the Potomac & George's Creek Coal Co. is increasing its force.

WEST VIRGINIA

Annabelle—A compressed air charging station for mining locomotives in the Annabelle mine was recently the scene of an accident which injured three men. This station evidently received too great a pressure of air, with the result that a blow-out occurred. The accident did not damage the mine beyond the immediate vicinity of the charging station, and the property damage will be small. The three workmen, however, comprising a locomotive crew, were all severely injured.

Charleston—Work will be resumed in full at the Briar Creek mines of the Olcott Coal Co. within a few days. It is believed that to fill the orders for coal that this firm has received it will be necessary to operate the mine six days per week. More than 1,500 men are employed by the Olcott company.

Shinnston—Indications point to an early development of a considerable area in the vicinity of Wyatt. It is believed that a railroad will come up Bingamon Creek within the next year or so. Most of the coal in that section has been sold for some time, and agents are now buying up the surface. The development of this territory will necessitate the construction of a railroad to the region.

TENNESSEE

Briceville—Mines in this section are beginning to work on longer time. The Cross Mountain mines are running 4 days a week and the Royal-Consolidated 4½ days. Heretofore they have been doing little better than two days a week. The miners in this section are looking for steady work to begin soon, and a party of 50 which went to Kentucky recently has returned.

KENTUCKY

Providence—The Providence Mining Co. has completed its new store and office building here and on Oct. 1 and 2 held a formal opening. This is a two-story vitrified-brick building, and with the other buildings occupied by the company gives it a solid block.

Louisa—Mines of the Eastern Kentucky Coal Co., at Torchlight, have shut down for an indefinite time. It is reported that the company will construct a firebrick plant to make use of the vein of fire clay which is known to exist on the property.

Logmont—The Crystal Coal Co., which has recently opened a new property, built new camps and added to its machinery equipment, is advertising for 100 loaders. The mine, located on the Stoney Fork Branch, 9 miles from Middlesboro, makes full time.

OHIO

Columbus—Preparations are being made by the officials of the Lorain Coal and Dock Co., to open another mine in the eastern Ohio district. The Lansing mine is now being put into shape for operation. This will make all four of its eastern Ohio mines in operation. They are the Lansing, Wheeling Creek, Crescent and Blaine. This company is now loading approximately 1,000 tons daily at the Logan County, W. Va., mine which is called Larado. It is expected to have the capacity increased to 2,000 tons daily by the first of the year. All of the present development is intended to be loaded over the one tipple, which is one of the largest in West Virginia.

Bellaire—It is stated that the Pittsburgh-Belmont Coal Co. will shortly put its No. 2 mine in operation. Repair men have been at work for some time and the mine is now ready for working. It has been idle for 18 months, but when running will give employment to several hundred men.

INDIANA

Clinton—The J. K. Dering mine No. 1 is on full schedule since receiving a contract to supply 1,000 tons of coal a day to the Grand Trunk R.R. The output of the mine is about 1,500 tons a day. It is electrified and employs about 250 men.

Bicknell—The first annual state-wide first-aid meet for miners will be held here Oct. 30 under the auspices of the local unions of U. M. W. of A., coal operators of Knox County, merchants of Bicknell, the Federal Bureau of Mines and the American Mine Safety Association. It will be the first annual meet held in Indiana. Prizes will be awarded for the various events. It is expected competition will be keen.

Vincennes—Efforts are being made to have the Vandalia R.R. Co. operate a miners' train from Bicknell to this city, making the trip out in the morning and returning in the evening in the interest of the miner's accommodation. If the train were to be provided to run to the American mine, the largest in the city, it is stated that 150 miners now living in Bicknell would make their homes here. The railroad company has offered to put the train in service on condition that the Vincennes merchants will guarantee $1,000 monthly in passenger fares.

ILLINOIS

Edwardsville—One of the cages in the No. 3 coal mine here fell down the shaft recently carrying a loaded coal car with it. The shaft was damaged and the hoisting apparatus was incapacitated. The 36 miners who were below had to climb up the airshaft. Nobody was hurt.

Hanna City—An explosion recently in the Empire Mine of the Logan City Coal Co. killed one man and fatally injured another while 75 miners were entombed two hours. The explosion occurred in gallery No. 6, 250 ft. below the surface and more than a mile from the mine opening. Escape to the shaft was cut off by a fall of slate and coal which filled the gallery. Fire broke out and it was an hour before the flames were extinguished. The imprisoned men were then located by tappings and rescued. The cause of the explosion has not been determined. The damage to the mine was several thousand dollars. State mine examiners are investigating.

Danville—The Interstate Commerce Commission was recently restrained from hearing further evidence in the discrimination and damage suits brought by coal companies against the railroads. The coal companies must now seek relief in cases of this nature in the state courts. This case is said to be the first of its kind that has come before the U. S. Court in this district and sets a precedent. The three judges hearing the case held that the Interstate Commerce Commission had no jurisdiction in the matter.

WYOMING

Kemmerer—Two miners in the employ of the Diamond Coal and Coke Co. recently entered mine No. 1 before the fire boss had given permission, thereby endangering their own lives and those of others. The men were arrested, arraigned before a justice of the peace, and after being found guilty, were fined $25 and costs.

FOREIGN NEWS

Cardiff, Wales—Two thousand miners in the Aberdare district and 400 at Dunvant recently went on strike, protesting against the employment of non-union men. They appointed grievance committees to confer with the colliery owners.

London, England—The Board of Trade is urging coal merchants to lay in as great a stock of coal as they are able to store before the advent of winter. This is done not only with the object of keeping the mines in full work, but also to reduce to a minimum the demands upon carting and transport facilities in general during the coming season. Householders are also urged to follow the example of the dealers where they have accommodations for storing coal, so that later on the available resources may be used to supply those who have no storage place at their disposal.

PERSONALS

James M. Page has resigned his position as superintendent of the Sunnyside Coal Mining Co.'s mines at Strong, Colo.

James J. Stickler has been appointed mine inspector in the 18th district of Pennsylvania, filling the vacancy caused by the death of John E. Curran.

Frank P. Cory, for the past few years superintendent for the Kennon Coal Co., of Flushing, Ohio, has been appointed deputy mine inspector for the 9th district.

W. L. Hughes, formerly connected with the Midland Coal Co. and at the head of the Hughes Coal Co. at Drakesboro, Ky., is now associated with the reorganized Lam Coal Co. at Bevier, Ky.

W. J. Wolfe, for the past several years superintendent of the Four States Coal Co.'s mine at Annabelle, W. Va., has resigned his position and will be succeeded by A. C. Beeson, from Pittsburgh, Penn.

George Watkins Evans, consulting mining engineer of Seattle, Wash., has returned from the Bering River coal field where he was in charge of subdividing it into units of from 320 to 2,560 acres for the United States Bureau of Mines.

F. B. Sutton, of Birmingham, Ala., engineer for the Bureau of Mines for the Southern District, has been spending some time at the Knoxville, Tenn., office. He recently addressed the meeting of the mine foremen of Tennessee held at Coal Creek.

John Harding, interested in the Connellsville coke industry for a number of years, has assumed the superintendency of the Garwood plant of the Aetna Coal and Coke Co., succeeding C. L. Patterson. Mr. Harding has lately been in business for himself.

P. J. Harrigan, of Martin's Ferry, Ohio, for some years superintendent of the Wheeling and Lake Erie Co., has tendered his resignation and accepted the position of general superintendent of the O'Gara mines in southern Illinois. His new position embraces about 15 mines in the southern part of the state.

George W. Gehres, general superintendent of the Martin, Bowood, and Republic mines of the Republican Iron & Steel Co., has resigned his position to take effect at once. He has been in the service of the company nearly two years. He will be succeeded by George W. Morse, superintendent at the Republic works.

Henry Wharton has resigned as secretary of the Westmoreland Coal Co., effective Oct. 1. At a recent meeting of the company the resignation was accepted and the board elected Herman Roll, secretary and Howard R Yearsley, assistant secretary. The company has also newly created the position of general sales agent and has appointed Carroll B. Nichols, former assistant secretary, to fill this office.

OBITUARY

William H. Hufstader, vice-president and general manager of the J. B. Jenkins Coal Co., of Buffalo, N. Y., died Oct. 4, at the age of 48. He had been ill for some time and was not expected to recover. He was formerly Buffalo sales agent of the Pittsburgh-Buffalo Co. and for a long time previous to that traveled for the Shawmut Coal & Coke Co. He was a man of excellent character and his loss will be severely felt. He leaves a wife and four children.

Charles Horning, Jr., for many years connected with the New York office of the Susquehanna Coal Co., died at his home, No. 2 Glenada Place, Brooklyn, Oct. 3, of a complication of diseases. He was born in New York City 51 years ago. Mr. Horning had been indentified with the coal business for more than 25 years first as a salesmen for W. M. Davidson & Co. Later he was associated with Percy Heilner & Son and then with Stickney, Conyngham & Co. When the Susquehanna Coal Co. succeeded the later company Mr. Horning remained with it becoming office manager some time later. He recently resigned his position and was to have become connected with Heilner & Son on Oct. 1. The deceased is survived by his widow and two daughters.

PUBLICATIONS RECEIVED

Annual Report of the Department of Public Works of the Province of Alberta, 1914. Unillustrated, 293 pp., 6½x10 in.

University of Texas, Bulletin No. 365. "Mineral Resources of Texas," by William B. Phillips. Illustrated, 362 pp., 6x9 in.

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INDUSTRIAL NEWS

Brownsville, Penn.—A barge being towed by the steamer "Volcano" of the Diamond Coal & Coke Co. was recently caught in the swift current of the river and swept against the wall of lock No. 5, resulting in the loss of 7,000 bu. of coal.

Welch, W. Va.—Col. William Leckie has recently taken over 2,400 acres of coal land on Piney Creek, in Raleigh County, which was formerly owned by the McCreary interests. As soon as the railroad is extended up Piney Creek Colonel Leckie will develop this land.

Charleston, W. Va.—The Central-Fairmount Coal Co. has closed a yearly contract with a railroad company for the latter's entire requirements of coal, and is installing new equipment and hiring additional miners so as to increase the output of its local mines about one-third.

Moundsville, W. Va.—Men are now at work cleaning up the Fort Pitt mine across the river from Moundsville. The mine will be in shape for resumption in the near future. It is stated that this mine is to be sold at public auction shortly and will be put in operation immediately afterward.

Huntington, W. Va.—The past month's coal record on the Chesapeake & Ohio R.R. was higher than all previous records, by somewhat over 17,000 tons. During August, which was until September the banner month in the road's history, 2,423,120 tons were handled; while in September 2,440,955 tons were hauled.

Stockton, Penn.—The Lehigh Valley Coal Co. has started preparations for extensive stripping operations. As preliminary to the real work of taking out coal contractors are removing several hundred thousand tons of culm which has accumulated for years, the ground having been used as a dump for colliery refuse.

Harrisburg, Penn.—Estimates furnished on Sept. 30, to the Pennsylvania R.R., show a total of 1,370,000 tons of coal stored in the vicinity of Harrisburg. Of this amount 620,000 tons of anthracite coal is piled up at McClellan, bituminous being stored as follows: Lucknow, 250,000 tons; Enola, 250,000; Rutherford, 250,000 tons.

Boston, Mass.—Progress is being made on the new rehandling plant of the Darrow-Mann Co. at Mystic Wharf, Boston. A 600-ft. pier where the largest steamers can discharge is one of the features and there is ample yardage for forwarding shipments for delivery inland. Developments with regard to this plant are being followed with much interest by all the trade.

Trotter, Penn.—Suit was filed on Sept. 28 by Luke Gillen against the H. C. Frick Coke Co., for $10,000 for personal injuries received from a fall of coal at the Trotter mine May 29, 1913. The statement of claim filed alleges that the plaintiff sustained a fractured collar bone, broken ribs and injuries about the head, arms and legs. Gillen was a track repairman inside the mines.

Hickman, Ky.—In view of probable controversy and another appeal to the Interstate Commerce Commission the Nashville, Chattanooga & St. Louis R.R. has split the difference in the increase in rates on coal it is authorized by the commission to charge. Instead of making the rate $1.50 as the commission provided, the railroad is increasing the former price of $1.20 to $1.35.

Wilkes-Barre, Penn.—Judge H. M. Edwards recently handed down an opinion in the coal royalty case of the heirs of George M. Hull of Blakely against the Delaware & Hudson Coal Co. The decision is in favor of the plaintiffs. More than 6,000 typewritten pages of testimony were read and reread by the Court, the opinion covers 100 pages and the request for findings and answers covers 175 pages.

Toledo, Ohio—A job of salvaging which will go on record as the first feat of its kind ever attempted in Toledo harbor, will be attempted here by Harry Baker, of Detroit, a diver and wrecker, who will try to raise the steamer "Genoa" without removing its cargo of 1,200 tons of coal, and float it into dock. Baker has undertaken to cofferdam the vessel, pump the water from it and float it without lightering the cargo.

Philadelphia, Penn.—It has been estimated that the anthracite shipments for the month of September are at least 500,000 tons below the production of 1914, which was 6,296,192 tons. This past month, along with June, July and August were so short of tonnage that it is believed when the figures for September are officially announced it will show that the nine months of the year are 2,500,000 tons short of the similar period of 1914.

Salt Lake City, Utah—While the details of the purchase of the properties at the American Fuel Co. by the Utah Fuel Co. have not been worked out, it is stated that the deal has been made. The price paid for the property is said to be between $1,250,000 and $1,500,000. It is stated that everything is ready for the final transfer as soon as inventories are made. It is believed, however, that the Utah Fuel Co. will not take charge of the property before Nov. 1.

Pittsburgh, Penn.—Residents of Valley Camp, a village on the Allegheny River near here, are in fear that the town will be engulfed in the abandoned workings of a coal mine over which the houses are built. Cracks recently appeared in several streets, and porches began to settle into holes which suddenly yawned as the supports in the old entries and rooms gave way. Water and gas pipes were broken, and houses were damaged by falling plaster. All the affected streets have been closed by the authorities.

Louisville, Ky.—The bondholders of the Continental Coal Corporation have agreed in requisite numbers to the plan of reducing interest on an issue of bonds totaling $1,900,000 for a two-year period ending July 1, 1917. For two years, under a trust agreement arranged in connection with the Louisville Trust Co., these bonds will pay 3 instead of 6 per cent. Consent of 80 per cent. of the bondholders was obtained. The corporation's mines are located in Bell and Harlan counties, and more than $600,000 of the bonds are owned in Louisville.

Buffalo, N. Y.—The new box-car unloader built at the Lehigh Valley lake shipping docks at the Tifft Farm is completed and has been given a trial. After some minor adjustments the apparatus will be used regularly in loading lake vessels. The car is not elevated, but is tilted up at an angle of 32°, first at one end and then the other, using a device for assisting the coal to run out of the doors to an apron, where it is taken up by pan conveyors and discharged into the vessel's hold without material breakage. It is claimed that 1,000 tons an hour can be transferred by the unloader, which is an entirely new invention, calculated to handle box cars without taking up either so much time or ground as the present wooden trestle. It was built by the McMyler Interstate Co., of Ohio.

New Orleans, La.—Coal concerns operating in this territory were the heaviest sufferers from the storm of Sept. 29 and 30. There are 22 known dead in New Orleans; 250 dead in the parishes surrounding the city, and the damage done to property can only be estimated in the millions. The work of rehabilation is being pushed rapidly, and business has been put back to practically a normal basis. The greatest loss of the storm probably will be sustained by the Monongahela Coal & Coke Co., which lost a power boat, tugs and 246 barges loaded with coal. Captain J. S. Menges, manager of the floating stock of the Monongahela company, and three in his crew were drowned. Work of raising the coal from the bottom of the Mississippi is being pushed rapidly. Suction dredgers have been ordered from various headquarters of the company. The W. G. Coyle Coal Co. lost two pump boats and four barges. The Crescent City Coal Co. lost two tugs and four barges loaded with coal. The Alabama & New Orleans Transportation Co.'s lighter No. 3 was beached 80 miles below the city, but all efforts are being made to float her. A tug boat and barge, property of the Bisso Towboat Co., sank at the head of General Taylor St. The barge was loaded with coal. The West Kentucky Coal Co. lost 70 loaded, and two empty coal barges and four pump boats. The reserve fleet maintained by the company was completely wiped out, not a barge or pump boat being saved. The fleet at the coal loading station fared a little better; one angle boat, two loaded, and 23 empty barges being kept afloat. A total of 36,000 tons of coal was contained in the 70 loaded barges which went to the bottom, but it will be possible to salvage a certain proportion of this by dredging, since the barges sank at their moorings.

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., OCTOBER 1, 1915,

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Known bondholders, mortgagees, and other security holders holding 1 per cent. or more of total amount of bonds, mortgages or other securities. Mortgage on building held by Dime Savings Bank, Brooklyn, N. Y.

C. W. Dibble, Vice-President,
HILL PUBLISHING COMPANY.

Sworn to and subscribed before me this 30th day of September, 1915.

RICHARD L. MURPHY,
Notary Public.
(My commission expires March 30, 1917.)

Coal Trade Reviews

General Review

Colder weather releases more anthracite orders. Strong constructive features in the bituminous market. Export trade dominated by vessel situation. Large movement from Upper Lake ports. Middle Western trade satisfactory.

Anthracite—An encouraging and satisfactory briskness characterizes the hard coal market. The tonnage movement is still substantially less than normal, but with anything like average weather conditions an active business is assured for the next half-year. Coal is moving out freely from the retailers' yard, and more orders to the wholesalers are being released, some even being of an urgent character. An encouraging feature of the situation is the firm position dealers are now taking as regards credit, all orders not on a strictly cash basis being generally declined. Colder weather toward the Northwest has started coal moving to interior points from the upper Lake ports making more storage room available, and releasing further shipments from this end.

Bituminous—Prices are steady, the market well maintained, and there is a well defined feeling that next month will find the situation much stronger. The market has shown a persistent improvement over the past several weeks, and along conservative lines. Strong constructive features have developed in the shape of the restricted car and labor supply and the expanding export trade, with the result that dealers are openly optimistic and some even enthusiastic regarding the outlook. Scarcely any free coal is noted in any direction, and some manufacturers are even taking tonnages exceeding their contract agreements. So far there has been no particularly significant price change with the possible exception of general hardening all along the line and particularly as regards the better qualities.

Exports—Our foreign trade is now completely dominated by the vessel situation. The steadily increasing demand for grain vessels, noted over the past several weeks, has resulted in freights being whirled up to absolutely prohibitive levels, except in the case of most urgent demand. The export movement has contracted in direct proportion to the increase in freight rates. The September dumpings over the Hampton Roads piers show a sharp decline over the previous month, while the weekly movement out of Baltimore now occasionally gets down to about one-fourth the maximum. The situation is even reflected in the coastwise freights which are stiffer and slightly higher.

Lake Trade—The usual between-season contradictions prevail in the Ohio trade. It is generally agreed that the market is some stronger in any event, though it is noted that the consumers in certain localities are still confident of being able to obtain all the coal they require at any time and are showing no interest. The car shortage is now definitely at hand and shippers are refusing to consider orders in which any special equipment is specified. The recent cold snap in the Northwest brought with it a flood of urgent orders indicating that retailers' stocks are light, but there is still little storage space available, and receipts continue small for the time being.

Middle West—Sporadic low temperatures have created some activity in retail distribution which has been supplemented by some heavy buying as a result of the advance in the freight rates, effective the first of the current month. The market is not notably active, but the technical position is strong. Prices are generally on a substantially higher level than a year ago, and operators in some districts are already sold up ahead on certain grades. Accumulations of the steam sizes are noted as a result of the increased production of the domestic grades, but there is no attempt being made to force the market. Working schedules in the mining regions are much improved.

A Year Ago—Anthracite collieries continue on a full time basis, but the demand has slowed up temporarily. Considerable bituminous coal available and current business generally discouraging. Large preponderance of finer sizes still demoralizing the interior market. England increases her export shipments.

BUSINESS OPINIONS

Iron Age—September made an astonishing record for steel and pig iron output, and the pace is even faster in the first week of October. The present month, in view of the custom at all plants to strain for records in October, now promises the passing of the 3,000,000-ton mark in both pig iron and steel ingots. Pig iron production in September was 2,852,561 tons, or 95,085 tons a day, well beyond the daily rate of 92,369 tons in February, 1913, the previous record month. The 268 furnaces in blast Oct. 1—a gain of 19 in the month—had a daily capacity of 97,535 tons, and as a few furnaces have blown in in the past week, pig iron production is now at the rate of about 36,000,000 tons a year. It was 33,500,000 tons a year as September opened.

American Wool and Cotton Reporter—The wool market is recovering from the slight easing off which it recently underwent. It is steadier than it was for the previous week. The consensus of opinion is that prices will remain at least steady and a good number feel that advances will be made. A quantity of wools at cheap prices have sold, including medium grades.

Boston News Bureau—It seems idle to talk pessimistically when every fundamental factor in this country seems favorable for the time being. General trade, outside of war orders, has apparently called the turn for the better. Railroad earnings are beginning to show a marked improvement. The strength in raw products is based purely on demand and supply. But the great advance in prices of some raw products has served to conserve sentiment. Cotton mills are not purchasing the quantity of cotton they usually do at this season of the year because of the sharp advance in the price. We are in the midst of a wild speculation in the so-called war stocks. This strength, however, has a basis and that is their earning power. Perhaps the most pleasing feature in the market situation is the increasing strength in the railroad securities.

Bradstreet—Trade reports, good last week, are even better this week. There is more snap to trading, uncertainty about the future has well-nigh given place to certainty, interest in the European war is simmering down to a discussion of what it will produce in the way of orders for the United States, the Anglo-French loan to be floated here favorably affects credit-making factors, money is abundant at low rates, some branches of the finished steel industry are in a sold-up condition, railway buying is in evidence, reports of car shortages in the Middle West are noteworthy, labor is becoming scarcer, lower temperatures have quickened distribution of seasonable goods, and payrolls continue to expand. Incidentally, flour millers at the Northwest are sold ahead, some munitions plants are working three shifts in 24 hr., machine-tool shops are taxed to make deliveries, and in some centers these interests are bidding against makers of munitions for needful labor.

Dun—Success of the foreign loan negotiations foreshadows a further extension of American enterprise and emphasizes the position occupied by this country in the field of international finance. With constructive factors multiplying, prospects steadily brighten, and actual gains in business are now more in keeping with the growth of optimistic sentiment. Almost without exception, reports from the leading centers tell of accumulating evidence of progress and only in isolated cases, such as in the lumber trade, is depression still manifest.

Marshall Field & Co.—The current week shows a more active wholesale distribution of dry goods. There has been a larger attendance of buyers in the market. Collections are fair. The advancing market on raw cotton has resulted in material advances in prices on cotton yarns and in many lines of cotton goods. The conservative manner in which retail merchants have been buying during the last few months and their light commitments for fall delivery have created a shortage in many lines of merchandise, which always means advancing prices as well as uncertain deliveries.

ATLANTIC SEABOARD

BOSTON

Hampton Roads market continues steady. Georges Creek and Pennsylvania grades practically unchanged. Water freights slightly firmer and anthracite situation is improved.

Bituminous—The market for Pocahontas and New River continues steady and prices f.o.b. Hampton Roads are reasonably well maintained. While there are no pronounced developments for October coal there is now a well-defined feeling that by November the situation on the Southern coals will be much stronger. Much of this is based on the good outlook for export trade, but the prospect rests somewhat on a possible curtailment in car supply and also on a shortage of labor. One of the interesting bits of news from the mining regions concerns the scarcity of skilled help as engineers, machinists, and others. They are so much in demand at munition plants that tempting inducements have been made and in many cases accepted.

Water freights are a little firmer; 70c. was paid this week on a barge from Hampton Roads to Providence, which is 5c. up from previous charters; 80c. is a quotable rate from the same ports to Boston. The owners of the schooner "Mary W. Bowen," about 3,500 tons capacity, long a familiar vessel in the coastwise coal trade, are negotiating to sell her to freight lumber from Canada to France, a further illustration of the passing of the schooner collier.

The Georges Creek shippers are handling a normal output with ample coal for spot requirements. There is no apparent shortening up, but the off-shore demand is counted upon to absorb a large tonnage during November.

There are no special developments in the Pennsylvania grades. The quality coals show some signs of hardening prices, but there is no price movement that is at all general.

Anthracite—The retailers are now amply supplied with business and the wholesale market is looking up considerably. Orders have been coming in very steadily the past week and the dealers are beginning to press for shipments. Broken coal is quite short at the loading piers and there is an increasing shortage of the steam sizes.

Bituminous quotations, f.o.b. loading ports at points designated, are about as follows per long ton:

	Philadelphia	New York	Baltimore	F.o.b. Mine
Clearfields	$2.15@2.65	$2.45@2.95	....	$0.90@1.40
Cambrias and Somersets	2.40@2.90	2.70@3.20	....	1.15@1.65
Georges Creek	2.92@3.02	3.22@3.32	$2.85@2.95	1.67@1.77

Pocahontas and New River prices, on cars Boston, are $3.55@3.73, Providence, $3.50@3.68, and f.o.b. loading port at Hampton Roads, $2.80@2.85.

NEW YORK

Anthracite market shows improvement. Buying active and prices for individual coals much stiffer. Bituminous demand increases. Better prices asked and outlook bright.

Anthracite—The first week in October has brought about much improvement in the anthracite market. Weather conditions have been favorable for coal consumption and coal is beginning to move. Wholesale buying is more active than last week and quotations are closer to the full companies' circular for the individual product.

Demand along the line shows greater improvement than at Tidewater. The betterment is more noticeable among the independent coals than elsewhere. Occasionally odds and ends have been let go at less than August prices, but most of the coal is bringing at least full August circular and some better.

Nut coal is the longest of the prepared sizes. In the steam sizes buckwheat is becoming scarcer; the better grades are commanding the full circular, while the cheaper coals are being taken up quickly.

Current quotations, gross tons, f.o.b. New York, tidewater, follow:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$5.05		$5.10	
Egg	5.30	$5.20@5.30	5.35	$5.25@5.35
Stove	5.30	5.20@5.30	5.35	5.25@5.35
Chestnut	5.55	5.30@5.55	5.60	5.40@5.60
Pea	3.50	3.25@3.50	3.55	3.50@3.55
Buckwheat	2.75	2.25@2.75	2.80	2.25@2.80
Rice	2.25	1.85@2.25	2.30	2.00@2.30
Barley	1.75	1.50@1.75	1.80	1.75@1.80

Bituminous—The bituminous situation at tidewater shows much improvement and demand and prices are much stronger. Dealers appear to be enthusiastic over the outlook and predict still better business within the next week or ten days. Some are of the opinion that the long looked for rush is very near.

The demand from manufacturers all over the East is increasing and many are now taking more coal than their contracts call for. At Tidewater there is no large quantity of free coals and what can be spared is easily placed. All surplus coals are being held firmly and in urgent cases very good prices are being received. The harbor is fairly well cleared up of demurrage coal.

Labor is scarcer and this is becoming serious problem in some cases. Car supply on two of the largest roads was good the first three days of the week and bad the last three.

Exporters report good demand. One large exporter predicts shipments of 1,500,000 tons a month shortly. It is also reported that a contract has been closed for sending 6,000 tons of gas coal to Italy. Bunkering business continues active.

Quotations f.o.b. New York tidewater per gross ton follow:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.20@3.30	$3.20@3.30	$3.20@3.30	$1.75@1.85
Georges Creek Tyson	2.95@3.00	2.95@3.00	2.95@3.00	1.40@1.45
Clearfield:				
Medium	2.65@2.80	2.65@2.80	....	1.10@1.25
Ordinary	2.65@2.70	2.65@2.70	....	1.10@1.15
Broad Top Mountain				1.10@1.45
Cambria County:				
South Forks	2.90@3.05	....	....	1.35@1.50
Nanty Glo	2.80@2.85	....	....	1.25@1.30
Barnesboro	2.65@2.70	....	....	1.10@1.15
Somerset County:				
Quemahoning	....	2.80@2.90	2.80@2.90	1.25@1.35
Medium	2.65@2.70	2.65@2.70	2.65@2.70	1.10@1.15
Latrobe	2.55@2.65	....	....	1.00@1.10
Greensburg	2.85@2.90	....	....	1.20@1.25
Westmoreland	3.20@3.30	....	....	1.40@1.50
West Virginia Fairmont ¾		2.70@2.80	2.70@2.80	.90@1.10
Fairmont mine-run		2.60@2.70	2.60@2.70	.80@ .90
Steam		2.55@2.60	2.55@2.60	1.00@1.05
Western Maryland		2.35@2.40	2.35@2.40	.85@ .90

PHILADELPHIA

Anthracite broken and stove in demand. Nut and pea better, but egg is off. Steam sizes active. Price cutting in retail trade grows. Bituminous continues to improve. Exports quiet, with vessels scarce.

Anthracite—Prosperity in a mild form prevails in the local market. All shippers are reporting greatly improved conditions. However, while there is some briskness due to the return of normal weather conditions, the tonnage is still behind what was expected. But with anything like favorable weather conditions there should be six straight months of good business from now on.

Dealers' teams are now seen in greater numbers on the streets than for a long time. All retailers report moving considerable coal and in fact seem to be busier than the shipper, but there is no doubt that dealers will begin to order in greater volume now. Shippers report collections better, which is very encouraging as it indicates that the retailer is doing more of a cash business. Retailers are now insistent on cash payments and are declining all other business.

While the railroads are not advertising the fact to the public, the car shortage "bug-bear" is looming up at no distant date.

Broken coal continues in active demand, more especially by the manufacturers. Egg coal has fallen off to some extent and the price has weakened. One conservative old concern with a very high-grade coal surprised a few selected buyers by offering this size at $3.65 at the mines. Stove is still strong, both in demand and price. Chestnut, while still far from normal, has shown a slow but steady improvement. Pea is undeniably firmer, but it is known that several individuals have offered to contract until Jan. 1, at $2 and no tax; this is in the face of considerable talk of a general advance of 25c. per ton on Nov. 1. Retailers will not like to see such a price effective as it will enable the price cutters to continue harassing their higher-priced competitors and spoil the effect of the advertising of the dealers who always maintain prices.

As noted last week, the steam sizes have assumed some briskness, which has continued and seems likely to for some time, as more people see the wisdom of stocking up against emergencies.

Circular prices, f.o.b. mines, per gross ton, to which the Pennsylvania State tax of 2½% per ton must be added, are as follows:

	Line	Tide		Line	Tide
Broken	$3.50	$4.75	Pea	$2.50	$3.25
Egg	3.75	5.00	Buckwheat	1.25	2.25
Stove	4.00	5.00	Rice	.85	1.75
Chestnut	4.15	5.25	Barley	.50	1.50

Bituminous—The market is growing better all the time and all seem to be most optimistic as to the future. There has been no rush, the improvement having come gradually until most of the operators are now quite busy. Many companies are reporting car shortage in spite of the fact that many railroad officials claim they are meeting the demand and expect to continue doing so. The operators resent this attitude, especially since they are compelled at a time like this to shut down occasionally because of a lack of cars. The export business still remains somewhat quiet, but even at that a fair tonnage is going forward. This trade continues to be handicapped by a lack of vessels and the storms of the past week have prevented so many ships from making port that some concerns with considerable coal at tide, are worrying about car-demurrage bills.

There seems to have been a general though slight increase in prices and a good average per gross ton at the mines is:

Georges Creek Big Vein..	$1.70@1.80	Fairmont gas, ¾........	$1.25@1.35
South Fork Miller Vein..	1.55@1.65	Fairmont gas, mine-run..	1.10@1.20
Clearfield (ordinary).....	1.15@1.25	Fairmont gas, slack......	.75@ .85
Somerset (ordinary).....	1.10@1.20	Fairmont lump, ordinary.	1.00@1.10
West Va. Freeport.......	.95@1.05	Fairmont mine-run......	.90@ .95
		Fairmont slack..........	.65@ 75

BALTIMORE

Big orders for foreign coal are piling up, but the movement is still restricted by lack of bottoms. Bituminous market gradually stiffens. Anthracite at retail now on the maximum winter basis.

While a total of more than 200,000 tons was exported from Baltimore during the month of September, the latter half of the period saw a big drop. Only 20,287 tons moved the last week in September. Three to four times that amount was shipped in some of the weeks of July and August. The delays are due to the fact that vessel bottoms are scarce. Several vessels under time coal charters are expected the coming week, however, and the export movement should improve again.

With business steadily improving the anthracite dealers here have settled down for a brisk fall and early winter period. On Oct. 1 the highest winter schedule to the retail trade, which provides an extra 25c. charge for hauling in heavy weather, went into effect. This schedule is as follows: Hard—No. 1, $7.35; No. 2, $7.60; No. 3, $7.85; No. 4 (nut), $8.10; pea, $5.85; buckwheat, $4.50. Sunbury—No. 2, $7.85; No. 3, $8.10; No. 4, $8.35. Lykens Valley—No. 2, $8.60; No. 3, $8.85; No. 4, $8.85. To this a charge of 25c. a ton is added when delivery is by bags or baskets.

The bituminous market is gradually stiffening. Car shortage was again a very apparent factor. Prices were firm at the following figures:

	Mines	Balt.*	Fairmont	Mines	Balt.*
Geo. Crk. Big Vein	$1.75	$2.93	Ordinary mine run	$0.85	$2.28
Geo. Crk. Tyson...	1.40	2.58	Ordinary ¾........	1.00	2.43
Clearfield.........	1.25	2.43@2.48	Ordinary slack....	.65	2.08
South Fork.......	1.45	2.63	Low sulphur mine-run.............	1.10	2.53
Latrobe..........	.95	2.13	Low sulphur ¾.....	1.25	2.68
Somerset (best)...	1.35	2.53	Low sulphur slack.	.75	2.18
Somerset (good)...	1.20	2.38			
Quemahoning.....	1.30	2.48@2.53			
Freeport.........	.85	2.03@2.08			
Miller Vein.......	1.10	2.28@2.33			

*F.o.b., outside Capes.

HAMPTON ROADS

Dumpings for week not so heavy as anticipated. Shipments from Hampton Roads during month of September amounted to 1,408,194 tons.

The coal dumpings over the Tidewater piers at Hampton Roads have not been as much as anticipated. There has been a falling off somewhat in the export movement with coastwise about normal. There has been a fair number of bunker steamers calling here and also a quantity of bunkers supplied to the Atlantic Fleet in Hampton Roads. Of the coal exported the largest quantity has gone to Italian ports, viz.—Spezia, Leghorn, Genoa, Torre Annuziata, Catania and Naples. The largest single shipment was loaded into the collier "Ulysses" for Cristobal and amounted to 12,010 tons of cargo and about 1,000 tons of bunkers.

The quantity of coal in cars on the railroad yards while not extra heavy is at the same time in excess of the normal with demand light. Circular prices are still being quoted on all grades but it is believed that some of the suppliers are shading these prices somewhat in order to dispose of coal on which there is a prospect of demurrage.

During the month of September there was shipped from the three ports on Hampton Roads 1,408,194 tons of coal of which the Norfolk & Western dumped 722,670 tons, the Virginian Ry. 311,674 and the Chesapeake & Ohio Ry. 373,850 tons. Although the Norfolk & Western dumped more coal than the other two roads combined, at the same time they have fallen behind their August dumpings. The Chesapeake & Ohio Ry. is also considerably behind their August figures while the Virginian Ry. has shown some advance over their last month's dumpings.

Railroad Tonnages—Dumpings over the local piers for the past five weeks compare as follows:

	Week Ending				
Railroad	Sept. 4	Sept. 11	Sept. 18	Sept. 27	Oct. 2
Norfolk & Western....	232,394	156,459	182,047	163,400	131,055
Chesapeake & Ohio....	82,485	93,260	87,680	91,341	72,996
Virginian............	72,302	70,855	59,597	79,176	59,997
Totals............	387,182	320,574	329,336	333,917	264,048

Ocean Charters, Clearances and Freights

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	To	Tons	Rate
P. W. Sprague	Manzanillo	709	$3.75
C. E. Randall	Fajardo[1]	863	
Wm. Booth	Calais	435	1.30
Frances M.	Cay Francis	1,096	
M. P. Smith	Cay Francis	528	
F. C. Bowen	Calais	892	1.35

[1] Porto Rico

BALTIMORE

Vessel	To	Tons	Rate
Kaupanger	Gothenburg	2,104	
H. Jensen	Port Limon	1,127	
Kanawha	Guantanamo	1,906	
Sangstad	Port Limon	1,459	
S. Guiseppe	Genoa	583	10.08
Unbe Mendi[1]	Italy	2,064	
Chasehill	Genoa	2,960	10.80

BALTIMORE—Continued

Vessels	To	Tons	Rate
Avona	Sweden	1,862	
Alf	Bocadel Toro	1,378	
Kennebec	Galveston	1,913	
E. J. Lawrence	Boston	2,483	
R. E. Merrill	Boston	2,309	

[1] Or Virginia

VIRGINIA

Vessel	To	Tons	Rate
Monkstone	Montevideo[1]	1,961	$8.64
Nairn	Suez	2,324	

[1] Option Buenos Aires $8.88 Oct.

ATLANTIC RANGE

Vessel	To	Tons	Rate
Muskegon	Port Militar	2,129	

VESSEL CLEARANCES

The following steamers have cleared from various ports, Sept. 24 to Oct. 1:

NORFOLK

Vessel	Destination	Tons
Taquary[1]	Pernambuco	2,027
M. Haskell[2]	Gabelo	2,295
Berwindvale[3]	Havana	8,000
Ulysses[2]	Cristobal	12,010
Pietro[4]	Naples	4,128
Monitowoc[5]	Buenos Aires	6,040
Trodenskjold[6]	Curacao	5,500
Stathatos	Leghorn	5,590
Mar Tersp[4]	Catania	6,000
Francesco[4]	Annuziata	5,016
Guiseppi G.[4]	Genoa	4,800
Nairn[1]	Suez Canal	5,000
M. Haskell[1]		2,500
B. H. King[4]	Ponta delgarta	1,445

NEWPORT NEWS

Vessel	Destination	Tons
Kintail[7]		5,072
Panama[8]	Valparaiso	3,500
Lovland[3]	Gardenas	3,600
Harlem[3]	Spezia	5,800
Belgier[1]	Cienfuegos	2,250
M. Pickands[1]	Mazron	1,500

BALTIMORE

Vessel	Destination	Tons
Sangstad	CostaRica	3,413
Hans Jensen	Sweden	2,694
Franklin	Egypt	7,031
Alf	Panama	2,949
Kaupanger	Sweden	4,200

PHILADELPHIA

Vessel	Destination	Tons
M. Belding	Jacksonville	492
F. Greadick	Gardenas	1,000
Berlin	Havana	1,400
Skulda[9]	Sagua	
Frank Brainerd	Nantucket	300
Camino	San Francisco	3,308
Bast[2]	Gloucester	
Brookside[3]	Brookline	
Henry Claye	Portland	
Saucon	Boston	
Marion	Gloucester	
Leesport	Searsport	
Kimberton	East Boston	
Manatawny	Biddeford	
Silver Brook	Portland	
Barry	Boston	
Meriam	Boston	
Langhorne	Everett	
Temple	Portsmouth	
Pocopson	Milton	
Preston	Bath	
Ehprata	Portland	
Mingo	Portland	

NEW YORK

To		Value
St. John	4,386	$22,882
Charlottetown	603	3,299
Yarmouth	1,022	5,157
Halifax	1,420	7,130

[1] Smokeless Fuel Co. [2] W. C. Atwater & Co. [3] Berwind White. [4] Pocahontas Fuel Co. [5] C. G. Blake Co. [6] Baker Whiteley Coal Co. [7] C. H. Sprague & Co. [8] Cin. & Ohio, C. & C. Co. [9] Phila. & Reading C. & I. Co.

OCEAN FREIGHTS

The freight market on grain is simply "boiling," and $15.60 per ton is now bid on grain to the West Coast of Italy. With this very active demand for grain it is materially difficult to interest owners in coals, and we cannot quote freight rates to the Mediterranean or even to the Plate with any degree of certainty. We would quote freight rates on coal by steamer as follows:

To	Rate	To	Rate
Havana..............	$2 50@2 75	Bermuda.............	**$3.00**
Cardenas or Sagua.....	2.75@3.00	Vera Cruz............	5.00@ 5.50
Cienfuegos...........	3.00@3 50	Tampico.............	5.00@ 5.50
Port au Spain, Trinidad.	3.75@4.00	Rio..................	8.64@ 9.12
St. Lucia............	3.50@3.75	Santos	8.64@ 9.12
St. Thomas...........	3 25@3.50	Montevideo...........	8.40@ 9.60
Barbados.............	3.75@4.00	Buenos Aires or La Plata	8.64@ 9.60
Kingston.............	2 75@3.25	Rosario..............	8.88@ 9.84
Curacao..............	3.25	West Coast of Italy....	10.80@13.20
Santiago.............	3 00@3.25	Barcelona............	10.56@11.52
Guantanamo..........	3 00@3 25	Valparaiso or Callac....	7.50
Demerara............	5.50@6.00	Marseilles...........	10.80@12.00

* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British steamers; neutral steamers are more difficult to obtain and the rates are always higher.

W. W. Battie & Co.'s Coal Trade Freight Report.

LAKE MARKETS

PITTSBURGH

Spot prices firm; contract coal easy. Operators at 60 to 70%, with more car shortages reported. Demand from steel industry heavy.

The market for spot shipment continues firm, but contract prices are not correspondingly strong; that is, mine-run is stronger at $1.05 for prompt than it is at $1.15 on contract to Apr. 1. The market is preparing for the decreased absorption that regularly occurs with the termination of Lake shipments, even though the decrease this time will be less than usual as Lake shipments are unseasonably light. Mine operations are at between 60 and 70%, taking the district as a whole.

Car shortages are being reported still more frequently and a decided scarcity is one of the possibilities of the next six weeks, as final shipments for Upper Lake ports are being made.

The steel industry continues to absorb its maximum of coal, but does not seem to be stocking up to any extent. Railroad demand is improved, with some stocking. Demand from retailers is below normal for the season, the weather being abnormally warm.

We quote free coal: Slack, 50@60c.; nut and slack, 90@95c.; nut, 95c.@$1; mine-run, $1.05; ¾-in., $1.15; 1¼-in., $1.25; contract to Apr. 1: mine-run, $1.15; ¾-in., $1.25; 1¼-in., $1.35, per net ton at mine, Pittsburgh district.

BUFFALO

Bituminous strong. Cars growing scarce. Local demand better than further east. Anthracite beginning to move.

Bituminous—The market is strong, not only from a heavy demand, but from the growing scarcity of cars also; if this latter trouble grows much worse there will be a decided advance in price before long. There is no dependence to be placed on flat-bottomed cars now, some shippers refusing to take orders for them. The chief difficulty is soon to be in the lack of motive power and it now looks as if the late fall would see one of the most severe car shortages on record.

Reports from the Pittsburgh region are to the effect that the Pennsylvania R.R. is furnishing not more than 75% of the coal cars asked for in many instances, and the difficulty is just begun. The bituminous shippers from that district are not hesitating to refuse orders if there is any doubt about acceptance and prompt pay and the rule is to pay no attention to orders for flat-bottomed cars.

Quotations on best grades, f.o.b. Buffalo, are:

	Pittsburgh	Allegheny Valley	Penn. Smokeless
Lump	$2.65	$2.45	$2.55
Three-quarter	2.50	2.25	....
Mine-run	2.40	2.15	2.30
Slack	2.05	2.00	2.30

Quotations and freight rates to points east of Rochester, N. Y., and Kingston, Ont., are per long ton and balance of this territory is on the short-ton basis.

Anthracite—The fall trade is setting in slowly. There have been quite a good many orders for delivery early in October, as that would not oblige payment to be made till November. Otherwise the improvement is not marked. Some increase in the rail movement is also reported and the shipments from the upper Lake docks are showing something of a fall-trade proportion, so that the Lake shipments can be kept up and possibly added to before long. The local anthracite trade is about as quiet as ever.

Shipments by Lake for the week were 98,650 tons, for September, 411,750 tons and for the season, 2,791,075 tons, as against 428,436 tons for September last season and 3,156,781 tons for the season to date last year.

Prices on anthracite per long ton, f.o.b. Buffalo, are: $5.60 for grate, $5.85 for egg and stove, $6.10 for chestnut and $4.30 for pea, to which 25c. per ton is added for delivery on board vessel. This price includes the Pennsylvania state tax.

COLUMBUS

The steam business shows increased strength. Considerable domestic buying and the tone of the market generally satisfactory. Price list is well maintained.

Increased demand for steam grades is the leading feature of the coal trade. This is noticeable in every direction and is due primarily to the activity shown in manufacturing circles. Munitions factories are springing up on all sides and the iron and steel industry is also booming. The tone of the market remains good and future prospects are growing brighter.

Considerable Lake tonnage is reported and vessels are busy moving coal from Ohio Lake ports to the Northwest. The congestion on the docks of the Upper Lake ports is relieved because of a better interior movement. The Toledo docks of the Hocking Valley loaded 88,000 tons during the week ending Oct. 1. A large percentage of this coal came from West Virginia, however. Shippers will be busy up to the close of navigation.

One of the worst features at this time is the appearance of a car shortage. On the Chesapeake and Ohio the shortage has been very marked. The Hocking Valley is making an effort to keep all of the coal cars possible on their lines. Shippers anticipate a rather severe car shortage during the winter.

Prices in Ohio fields, f.o.b. mines, are as follows, per short ton:

	Hocking	Pomeroy	Eastern Ohio	Kanawha
Re-screened lump	$1.50	$1.60		
Inch and a quarter	1.40	1.45	$1.30	$1.30
Three-quarter inch	1.25	1.35		1.25
Nut	1.15	1.25		1.15
Mine-run	1.05	1.10	1.00	1.05
Nut, pea and slack	.60	.65	.50	.55
Coarse slack	.50	.55	.40	45

Mines have been working at about the following percentages of full capacity:

District	Week Ended Sept. 11	Sept. 18	Sept. 25	Oct. 2	District	Week Ended Sept 11	Sept. 18	Sept. 25	Oct. 2
Hocking	40	45	50	50	Cambridge	44	45	45	45
Jackson	25	25	25	25	Massillon	40	45	45	45
Pomeroy	50	60	75	80	Eastern O.	60	70	75	80
Crooksville	35	40	40	40					
					Average	42	47	50	52

CLEVELAND

Prices are again higher. The supply is small. Demand for domestic coal causes an advance in prices. Short car supply restricting shipments.

There is a generally improved market with an upward tendency that is quite marked. The demand for domestic fuel is not as large as in former years, natural gas supplanting coal in many homes, but the trade is buying more freely and the car supply is proving a factor in getting deliveries.

Only 270 cars of new coal arrived over last Sunday. This is smaller number than usual and very much less than was customary at this time of the year four or five years ago. Fine coal is advancing, due largely to the lack of three-quarter orders, the Lake trade being only fair, though better than it has been.

The Lake trade is easily summed up in the report of The Tomilson Co., vessel managers and agents, of Duluth, which states that hard-coal receipts at Duluth-Superior to Oct. 1, 1915, totalled 1,129,220 tons, as compared with 1,070,800 to Oct. 1, 1914; bituminous receipts totalled 4,750,145 tons to Oct. 1 last, as compared with 6,309,300 tons to Oct. 1, 1914.

Jobbers are being quoted at the following prices, f.o.b. Cleveland per short ton:

	Pocahontas	Youghiogheny	Fairmont	Bergholz	Ohio No. 8
Lump	$3.70				
Lump, 6-in.				$2.30	
Lump, 1¼-in.		$2.40		2.10	$2.15
Lump, ¾-in.		2.30	$2.05	2.00	1.95
Egg	3.70				
Egg, 6-in				1.90	
Mine run	2.80	2.15	1.95	1.85@1.90	1.85
Slack		1.75@1.80	1.85	1.65	1.85

DETROIT

Buying of steam coal well sustained. Colder weather revives interest in domestic sizes. Anthracite business confined chiefly to retailers. Lake trade continues light.

Bituminous—Steam coal users are buying with sufficient regularity to make a gratifying volume of business for local shippers. Prices are steady and the quantity of consignment coal pressed on the market is not troublesome. With the lower temperature now prevailing domestic coal is coming in for more interest and inquiries are more frequent. However, still more frigid weather will be necessary before the business is really active.

Anthracite—High temperatures, through most of September restricted the retail business in anthracite but a more active demand is now apparent.

Lake Trade—The heavy demand for vessels to move grain has brought a rate of 6c. a bushel. Ship-owners, in the effort to take full advantage of these profitable rates are avoiding the delays attendant in moving coal by sending their vessels on the upbound trips without cargo. Some of the freighters carrying ore on contracts are handling coal but the movement is lighter than usual at this season

TOLEDO

Lake trade quiet. Car shortage still expected.

The domestic trade is fairly strong, due partially to the cold weather of the past couple of weeks. Steam coal also continues to show more strength. Lake shipments are still light. Considerable less coal has moved from Sandusky docks of the Pennsylvania Co., this summer, contrary to expectations of a better business. The ore shipments on the other hand have been very strong; more than 85,000 tons were received at this port in six days, an unusual movement. Freight rates are increasing. Some of the boats will lay up after Nov. 4, the date when the LaFollette seamen's bill goes into effect.

CINCINNATI

Improvement in sentiment is evident, although business remains relatively slow. Demand is much below normal in all lines.

Increasing inquiries are noted, mostly from the retail trade, steam consumers still showing general indifference as to their fuel requirements. Both retailers and consumers are apparently confident of their ability to get all the coal they want. This feeling is undoubtedly responsible for the prevailing lethargy in the trade, coupled with the fact that barring a few chilly days the weather remains pleasant. Production of coal is also at a high rate and this has been largely responsible for the competitive conditions which have hurt business of late. The opinion is generally that the market requires some sustained cold weather and this can hardly be looked for early in October. It is felt that this is bound to come, however, and the trade therefore feels that the worst is over, and that good business is ahead.

LOUISVILLE

Between seasons condition prevails. Market less active at the moment but outlook is still encouraging.

There has hardly been enough cool weather to relieve the stocked-up condition of the retailers and they are not in the market at this time, while the accumulation of the steam sizes is worse than before; a considerable amount of this latter is on demurrage. Operations at the Kentucky mines are on about the same basis as a week ago, western Kentucky mines not being as active as those in the eastern field. Car-shortage troubles are not as keenly felt just now, however, but this is only on account of a slackening in the demand. Prices are only fairly well maintained on the following basis for the best grades, per long ton, f.o.b. mines: Block, $1.75 to $1.85, with the especially fancy grades going higher; 2x4-in. round, $1.40 to $1.45; nut and slack, from 50 to 60c., for the best grades, and screenings are in very poor demand.

COKE

CONNELLSVILLE

Furnace coke contracts for 1916 at $2.25 and $2.35. Negotiations continue on sliding scale contracts. Spot coke firmer. Production and shipments not materially changed.

Very few furnace-coke contracts have been closed on a sliding scale basis, but in line with the suggestion in last report there has been some business done at flat prices. One contract involves 15,000 tons a month over the first-half at $2.25 and another 15,000 tons a month over the year at $2.25 if one brand is selected and $2.35 if another is chosen. As a rule the operators quote $2.35 to $2.50 for first half, but would take a shade less over the year.

Sliding scale contracts under negotiation are usually on such a basis that with the coke to advance 20% as much as pig iron they would yield $2.15 for the coke when basic pig is at its present level, $15, valley. It is expected that many contracts will be closed within the next fortnight as buyers and sellers are now fairly close together, and enough business has already been put through to show approximately where the market stands.

Furnace-coke for prompt shipment has stiffened at least 10c. in the week. Foundry coke is firm for both prompt and contract. We quote: Furnace coke, spot, $1.75@1.80; fourth quarter, $2; first half, $2.35@2.50; prompt foundry, $2.30@2.60; contract foundry, $2.40@2.60, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Sept. 25 at 388,884 tons, an increase of 6,417 tons, and shipments at 387,018 tons, a decrease of 3,272 tons.

Buffalo—The price of coke is without material change, but the market is not as strong as bituminous coal, for the reason that the trade has been anticipated too generally. When iron began to move there were a great many idle ovens started up and the result is an overproduction that has hurt the trade considerably. While producers do not like to admit this the jobbers are agreed that such is the case. Prices remain on the basis of $4.30 for best 72-hr. Connellsville foundry and $3.35 for stock coke.

Chicago—Byproduct coke is not so strong, and sales have been made as low as $4.70 for egg and stove. The gas-house demand continues quiet, but furnace and foundry coke are active at firm prices. Connellsville coke has been sold in this market recently at around $2.25 ovens.

Prices f.o.b. cars Chicago per net ton of 2,000 lb. are as follows: Byproduct foundry, $4.90@5.10; byproduct domestic, $4.75@4.85; Connellsville, $4.85@5; Wise County, $4.75@5; gas coke, $3.75@3.85.

MIDDLE WESTERN

GENERAL REVIEW

Domestic buying still brisk. Smokeless situation improved. Screenings stronger. Anthracite buying improved at close of month.

The frosty tinge to the atmosphere has caused some activity in retail distribution and the retailer is coming into the market heavier now that his stocks are dwindling away. The volume of business, except in domestic coals, still continues slightly below that of last year, but prices in every direction are at a noticeably higher level.

A number of Western operators report that they are still sold ahead on domestic lump from two to four weeks. Screenings have declined no further, and if anything have stiffened slightly. An increase in the accumulation of smaller sizes has occurred at a number of mines, and operators are finding difficulty in moving them, but they are not resorting to price cutting.

No "distress" coal is heard of, and it seems to be the attitude of operators to hold coal at the mines rather than to jeopardize prices by forced sales. A decided turn for the better is seen in steam coals; industrial buying of these grades is in greater volume. Lake movement continues to be quite heavy.

CHICAGO

Southern Illinois market stiffer and circulars are advanced at other points. Eastern coals in good demand.

The southern Illinois situation is becoming stronger almost daily. Wholesale buying is quite active, and prices for all coals are much higher than at this time last year. It is felt that screenings have touched the bottom now, being stronger at from 60c. to 70c., as compared with 10 to 25c. this time last year. Shipments into Northwestern territory were very heavy prior to the first of the month in order to take advantage of the advance in rates. No. 1 nut is being bought freely, and No. 1 washed is well held, but the accumulation of other small sizes is causing trouble.

A new circular, effective Oct. 1, was announced by the operators in the Springfield district, which quotes 6-in. lump at $1.75, nut and egg at $1.60, and steam lump at $1.50. The mines have not kept pace with domestic orders received, and screenings have slightly bettered in price. Pronounced activity now prevails in this field.

Very little Knox County coal is moving to Chicago, as most of it is absorbed by the steam trade in territory close to the mines. Clinton No. 4 and Sullivan County No. 6 domestic coals are moving in large volume to the retailers, and circular prices for October shipment are firm at $1.70 to $1.75. The domestic production of these mines is sold ahead for several weeks.

Considerable tonnage of Pocahontas has been delivered by independent producers at lower prices accepted earlier in the season. Mine-run has bettered, but is not at the full circular. The demand for lump and egg has improved. Prices this week have ranged from $1.85 to $2.25 for smokeless lump. Spot shipments of smokeless are light. Splint lump and egg is being disposed of as fast as produced, and prices in the Chicago district and westward are now well held owing to the stronger demand in other directions; 2-in. lump brings $1.25, ¾-in. lump $1.15, mine-run 85c., and slack mixture 40c. No change has occurred in Pennsylvania smokeless prices.

The demand for Hocking lump has been strong in Chicago and vicinity. Jobbers have been paying $1.50 for 3-in. lump, and sales have been made as high as $1.75, which has stiffened domestic sizes. It is said mine-run is improving and that screenings have advanced somewhat.

Eastern Kentucky shippers feel that they will be placed in an advantageous position by the announcement that West Virginia roads have been authorized by the Interstate Commerce Commission to advance rates to Ohio, Michigan and Indiana territory 15c. per ton on domestic sizes.

Quotations in the Chicago market are as follows:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump......	$1.60@1.75	$1.65@1.75	$1.50@1.60	$1.35@1.40	$1.40@1.55
Steam lump	....	1.40@1.50	1.20@1.30	1.15@1.20	....
2½ and 3-in. lump	....		1.40@1.50	....	1.30@1.40
1¼-in. lump.	....	1.25@1.30	1.25@1.30	1.15@1.20	....
Egg	1.60@1.75	1.50@1.65	1.10@1.20	1.05@1.15	1.15@1.25
Nut ...	....	1.50@1.65	.95@1.05	1.00@1.05	1.00@1.05
No.1washed	1.60@1.75	....	1.50@1.60	....	....
No.2washed	1.35@1.40	....	1.40	....	....
No. 1 nut .	1.60@1.75	....	....	....	....
No. 2 nut . .	1.35@1.40	....	....	....	....
Mine-run...	1.10@1.15	1.05@1.10	.85@ .95	.95@1.00	.85@1.05
Screenings . .	.60@ .70	.40@ .55	.60@ .65	.55@ .65	.75@ .80

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump......	$1.60@1.75	$1.65@2.25	$1.85@2.25	$1.75@2.00	$1.60@1.75
1¼-in. lump.	1.25@1.30	....	....	1.25@1.40	1.30@1.35
Egg	1.60@1.75	1.35@1.75	1.75@2.10	....	1.00@1.05
Nut.......	....	....	....	....	....
No. 1 nut. .	1.60@1.75	....	....	....	....
No. 2 nut .	1.35@1.40	....	....	....	....
Mine-run...	1.15	.90@1.00	1.25@1.40	1.25@1.40	1.10@1.15
Screenings. .	.60@ .70	.60@ .75	....	....	.50@ .60

West Virginia splint, 3-in. lump, $1.30@1.40: 1¼-in. lump, $1.15@1.25.

DULUTH

Cool weather starts coal moving. Retailers' stocks apparently light. Prices show no improvement.

This territory has had the first real cool weather of the season during the past week, with the result that business in a retail way showed a remarkable increase and the dock companies have been favored with the best week's business of the season. Large shipments of the "rush order" variety were the feature of the week and this would seem to indicate that little coal has been bought during the past summer for fall or winter storage. With the approach of cold weather, dock companies are looking forward to some real business from those points.

Receipts continue to be light, a number of the docks having no storage space available. Prices remain about the same although in a number of instances, concessions have been noted. Quotations per short ton, f.o.b. cars Duluth, are as follows:

	Yough.	Splint	Hock.	Smokeless	Elkhorn
Lump................	$3.40	$3.40	$3.40	$4.75	$3.75
Dock-run..............	3.10	3.10	3.05	3.25	3.25
Stove or nut..........	3.40	3.40	3.40	4.75	3.65
Nut screenings........	2.40	2.40	2.25	2.75	2.40

The demand for anthracite at this time of year is practically governed by the prevailing weather conditions. The cool weather during the past week has created quite a brisk market and the movement to country and interior points has been well up to the average. The dock companies are quoting f.o.b. cars, docks, per short ton, as follows: Egg and stove, $6.85; nut, $7.10; pea, $5.55, and buckwheat, $4.

ST. LOUIS

Readjustment in freight rates unsettles the market. Customary price increases at this time are not made.

When the Utilities Commission overruled the objections to the 5½c. increase in freight rates and gave notice that the increase would take effect Oct. 1, there was a scramble among East St. Louis dealers and steam users to have orders filled under the lower rate. The orders were for lump and screenings. The prices did not advance. The increased rates affected Granite City and all the other East side cities within the switching limits and the buying was as strong in these places as in East St. Louis. There was also some improvement in the movement to Southern and Western points.

Except for this flurry, the market is dull and prices were but little advanced on Oct. 1. Operators do not feel that under the prevailing conditions they can make the customary raise in prices at this time. The market is still overloaded, due to the unseasonable weather.

Quotations f.o.b. mines during the past week have ranged on the following basis per short ton:

	Frk. Co.	Wmsn. Co.	Staunton	Standard
6-in. lump.............	$1.50@1.75	$1.50@1.75	$1.25@1.50	$1.15
2-in. lump.............	......	......	1.15@1.20	1.00
5x6 egg................	1.35@1.75	1.35@1.65	......	1.00
No. 1 nut..............	1.50@1.75	1.50@1.75	......	.85
No. 2 nut..............	1.40@1.50	1.40@1.50	......	.65
No. 1 washed..........	......	1.65	1.40@1.60	....
No. 2 washed..........	......	1.25	1.10@1.25	....
No. 3 washed..........	......	1.25	1.00@1.25	....
No. 4 washed..........	......	1.20	1.05	
No. 5 washed..........	......	.60@70	.50@60	....
Screenings.............	.40@50	.40@50	.35@40	.40

Freight rates from the inner group of mines are: St. Louis, 57½c.; East St. Louis, 37½c. Outer group, St. Louis, 72½c.; East St. Louis, 52½c.

PRODUCTION AND TRANSPORTATION STATISTICS

CHESAPEAKE & OHIO RY.

The following is a comparative statement of the coal and coke traffic from the New River, Kanawha and Kentucky districts for July, 1914 and 1915, in short tons:

	July			
Destination	1915	%	1914	%
Tidewater....................	484,489	24	262,060	15
East..........................	154,618	7	186,613	10
West..........................	1,233,260	60	1,218,181	68
Total..........................	1,872,367		1,666,854	
From Connections				
Tidewater....................	....		....	
Bituminous....................	182,289	9	133,497	7
Anthra. (local)...............	....		....	
Anthracite....................	1,319		878	
Total..........................	2,055,975	100	1,801,229	100
Coke..........................	21,960		25,033	

SOUTHWESTERN TONNAGE

The following is a comparative statement of the Southwestern tonnage for May and the preceding three months:

	March		April		May	
State	1914	1915	1914	1915	1914	1915
Missouri...	263,593	271,374	179,723	196,032	165,394	161.575
Kansas.....	501,841	522,242	378,192	410,565	370,097	354,264
Arkansas...	165,037	90,252	87,002	80,118	95,749	71,023
Oklahoma..	296,484	243,505	239,443	181,873	241,180	173,821
Totals...	1,226,955	1,127,373	884,360	868,588	872,421	760,683

VIRGINIAN RAILWAY

Shipments of coal over the Virginian Ry. for the month of July amounted to 381,853 net tons, as compared with 301,932 tons in June.

IMPORTS AND EXPORTS

The following is a comparative statement of coal imports and exports of the United States for July, 1914-15, and for the seven months ending June, 1913-14-15, in long tons:

	July		Seven Months		
Imports:	1914	1915	1913	1914	1915
Anthracite, total	8,669	2,069	30	15,902	2,313
Bituminous, total	89,280	112,166	826,184	758,044	835,222
United Kingdom	26	680	3,464	8,258	15,410
Canada........	78,190	91,932	678,611	588,904	673,864
Japan..........	8,215	9,480	63,665	30,983	46,379
Australia.......	2,699	9,574	77,634	128,018	96,993
Other countries.	150	500	2,810	1,881	2,576
Coke............	9,011	3,657	39,698	61,715	24,389
Exports					
Anthracite total.	338,997	273,206	2,448,913	2,211,664	1,997,817
Canada........	328,175	267,712	2,411,892	2,175,407	1,968,404
Other countries.	10,822	5,494	37,021	36,257	29,413
Bituminous total.	1,339,987	2,226,493	10,008,012	7,090,084	8,587,735
Italy...........	....	502,750	....	....	1,641,791
Canada.........	1,005,859	1,016,413	7,120,245	4,525,830	3,790,586
Panama........	17,450	52,805	321,507	168,898	280,027
Mexico.........	38,571	14,138	350,961	190,363	197,739
Cuba..........	77,880	91,162	772,366	616,574	620,237
West Indies....	42,267	43,959	377,464	355,274	266,258
Argentina......	15,320	114,162	48,626	112,408	533,891
Brazil..........	4,612	84,813	187,555	100,530	429,969
Uruguay.......	....	26,689	....	45,594	99,834
Other countries.	138,028	279,602	829,288	974,613	727,403
Total coal.....	1,678,984	2,499,699	12,456,925	9,301,748	10,585,552
Coke............	57,648	69,825	550,751	408,441	430,604
Bunker coal.....	681,370	712,880	4,409,307	4,525,876	4,354,037

GREAT BRITAIN

Sept. 24—Easy conditions continue to prevail. Tonnage is not plentiful and stocks of both large and small coals are becoming heavier. Quotations are nominally as follows:

Best Welsh steam.......	Nominal	Best Monmouthshires....	$5.52@5.67
Best seconds............	Nominal	Seconds.................	4.80@5.04
Seconds.................	$5.52@5.76	Best Cardiff smalls......	3.84@4.08
Best dry coals..........	5.76@6.00	Cargo smalls...........	2.40@2.64

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—Outward chartering is a little more active with rates very firm all round. Rates are approximately as follows:

Gibraltar.........	$5.28	Naples..........	$7.68	St. Vincent.......	$5.28
Marseilles........	6.47	Alexandria.......	7.92	Rio de Janeiro....	6.72
Algiers...........	5.40	Port Said........	7.92	Monte Video.....	6.96
Genoa............	7.68	Las Palmas......	5.04	Buenos Aires.....	7.20

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

+Indicates contracts regarding which official information has been received.

Recast

In the following table we give a list of all old contracts coming up for consideration during the ensuing week. The table gives out contract number, the name of the purchaser, city, tonnage and page on which the detail notice appeared.

No.	Purchaser	City	State	Tonnage	Page
866	Water-Works Dept.	Cleveland	Ohio		576
1456	County Government	Portsmouth	Ohio	5,000 bu.	530
1462	Adams Sch. Dist. No. 79	Wheelock	N. D.		530
1472	Board of Education	Alpena	Mich.		531
1476	Essex County Hospital	Cedar Grove	N. J.	10,000	531
1500	Board of Education	Punxsutawney	Penn.		577
1502	State Bd. of Regents	Bismarck	N. D.	4,000	577
1506	N. J. State Prison	Trenton	N. J.		577

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

No. 614—Titusville, Penn.—Bids on this contract (Vol. 7, p. 795), which provides for furnishing the local Board of Education with approximately 2,000 tons of Youghiogheny rescreened nut, slack and three-quarter lump coal, were received until Oct. 4, instead of June 1, as previously announced. Bids are to include cost of delivery in the coal bin at the high-school building. Address Ch. F. C. Kirkpatrick, Supply Com., Titusville, Penn.

+1052—Savannah, Ga.—The requirements on this contract (p. 116), which provides for the fuel requirements for the local Board of Education involved 328 tons last year. The business was let to the Vulcan Fuel Co., at $8 per ton. Address Committee on Supplies, Board of Education, Savannah, Ga.

+1234—Kansas City, Mo.—Purchases on this contract (p. 283), which provides for furnishing the Consumers Bread Co. with approximately 150 tons of coal per month, will be confined to the open market. Address Pres. B. Howard Smith, Consumers Bread Co., Orear-Leslie Bldg., Kansas City, Mo.

1361—Davenport, Iowa—This contract (p. 411), providing for furnishing the Moline-Rock Island Manufacturing Co. and the Tri-City Railway and Light Co. with approximately 75,000 tons of 1¼-in. screenings, does not expire until April of next year. Address G. W. Kuhn, Moline-Rock Island Co., Davenport, Iowa.

+1379—Wheeling, W. Va.—Bids will be received on this contract (p. 447), which provides for furnishing the local Board of Education with its coal requirements during the ensuing year, until 8 p.m., Oct. 18. All bids should include cost of delivery to the school buildings as required. This contract to become effective Nov. 15. Address Clk. Frank Stanton, Bd. of Edu., Wheeling, W. Va.

1441—New Orleans, La.—The award on this contract (p. 490), which provides for furnishing the New Orleans Cold Storage and Warehouse Co. with approximately 3,500 tons of coal is being delayed pending a thorough test of the various coals on which bids were submitted. Address Purchasing Agent, New Orleans Cold Storage and Warehouse Co., Gainnie and Front St., New Orleans, La.

+1484—Sunbury, Penn.—Bids have been received on this contract (p. 576), which provides for furnishing the County Government with pea coal, as follows per long ton: G. A. Nevi, $2.90; C. A. Dagle, $3.05; J. A. Wilkinson, $3.35; J. A. Cross, $3.50; N. B. Boyer, $3.39. Address Controller Aaron Baker, Court House, Sunbury, Penn.

+1497—Cleveland, Ohio—This contract (p. 577), which provides for furnishing the Water Department with approximately 75,000 tons of coal, is now up for consideration, bids having been opened on Oct. 6. Address Comr. of Purchases and Supplies A. R. Callow, 511 City Hall, Cleveland, Ohio.

New Business

+1522—Kearny, N. J.—Bids will be received until noon, Oct. 19, for furnishing the New Jersey Home for Disabled Soldiers with approximately 1,200 gross tons of pea coal, and 100 tons of nut or stove coal. Deliveries are to be made during the year beginning Nov. 1. Address Vice-Pres., Edwin W. Hine, Bd. of Mgrs., New Jersey Home for Disabled Soldiers, Kearny, N. J.

+1523—Williston, N. D.—Bids will be received by the Board of Education of the Williston Special School Dist. No. 1 until 8 p.m., Oct. 12, for furnishing lignite coal as may be required during the ensuing school year. All bids must be accompanied by certified checks for $50, and the successful bidder will be required to furnish a surety bond for $1,000 guaranteeing the faithful performance of the contract. Address Pres. M. J. Borden, Central School Bldg., Williston School Dist. No. 1, Williston, N. D.

+1524—Shenandoah, Penn.—The West Mahanoy Township School for Boys received bids until 6 p.m., Oct. 1, for furnishing and delivering coal as required during the ensuing school year. Address Secy. Maurice Scanlan, West Centre St., Shenandoah, Penn.

+1525—New Hampton, Iowa—The county government received bids until 1:30 p.m., Oct. 11, for furnishing 200 tons of coal f.o.b., New Hampton. Address County Audr. P. E. McGinn, New Hampton, Iowa.

+1526—Minerva, Ohio—The Board of Public Affairs will receive bids until Oct. 13 for furnishing three-quarter coal as may be required during the ensuing year, f.o.b. cars at Minerva. A certified check for $10 must accompany each bid. Address Secy. F. A. Unkefer, Bd. of Pub. Affairs, Minerva, Ohio.

+1527—Flandreau, S. D.—The City Government received bids until Oct. 5 for furnishing and delivering 13 to 15 cars of Youghiogheny lump coal to the City Pumping Station as may be required during the ensuing year. Address City Audr. J. R. Coonrod, Flandreau, S. D.

1528—Memphis, Tenn.—The South Memphis Brick Co. are preparing to contract for their annual fuel requirements involving approximately 10,000 tons of No. 2 lump coal. They have a storage capacity of 200 tons, and deliveries are to be made by railroad as required. Address Pur. Agt., John J. Bishop, South Memphis Brick Co., Madison St., Memphis, Tenn.

+1529—Glasgow, Mont.—The Valley County Board of Commissioners received bids until 2 p.m., Oct. 4, for furnishing and delivering Bearcreek coal for the Court House and Jail as may be required during the coming year. Address Clk. W. B. Shoemaker, Bd. of County Comrs., Glasgow, Mont.

1530—Highland Park, Mich.—The Ford Motor Co. at this place is receiving bids for supplying their annual fuel requirements, involving approximately 25,000 tons of mine-run and 14,000 tons of nut, pea and slack coal. Bids should be submitted on a delivered basis at the company's plant at Highland Park. Address N. A. Hawkins, Ford Motor Co., Highland Park, Mich.

+1531—Wilmot, S. D.—The Board of County Commissioners received bids until noon, Oct. 5, for furnishing and delivering approximately 100 tons of steam coal and 15 tons of anthracite. Address County Audr. O. E. Lien, Bd. of County Comrs., Wilmot, S. D.

+1532—Yonkers, N. Y.—The Board of Contract and Supply received bids until 3:30 p.m., Oct. 4, for furnishing and delivering approximately 200 tons of anthracite broken coal for the Yonkers Tuberculosis Commission. Address Secy. Edwin P. Walsh, Bd. of Contract and Supply, City Hall, Yonkers, N. Y.

1533—International Falls, Minn.—Sealed bids were received by the International Falls School Dist. No. 4 until 2 p.m., Oct. 2, for furnishing Youghiogheny screened lump coal to the public school as may be required during the ensuing school year. Address Clk. School Dist. No. 4, International Falls, Minn.

1534—Washington, D. C.—The Sargeant-at-arms of the United States Senate will receive bids until Oct. 20 for furnishing approximately 50 tons of best extra-hard, white ash anthracite coal, 40 tons of stove ,and 30 tons of chestnut.

Address Sargeant-at-arms, Chas. P. Higgins, U. S. Senate, Washington, D. C.

1535—Bisbee, N. D.—The Board of Education at this place received bids until Oct. 2 for furnishing either 80 tons of Youghiogheny or 160 tons of lignite coal, f.o.b. carload lots at this place. Address Clk. O. M. Ness, Bisbee, N. D.

+1536—Wilmerding, Penn.—The Union High School Board will receive bids until 6 p.m., Oct. 12, for furnishing the High School with coal as may be required during the ensuing year. Address Secy. R. H. Ferguson, Union High School Bd. No. 4, Masonic Bldg., Wilmerding, Penn.

+1537—Le Mars, Iowa—The Haynes County Government is advertising for bids to furnish the Court House, Jail and County Poor with coal during the ensuing year. Address County Auditor, Le Mars, Iowa.

+1538—Wellsville, Ohio—The Board of Education at this place will receive bids until noon, Oct. 18, for furnishing the best grade Pittsburgh 1¼-in. coal to the local school building during the ensuing year. Address Clk. F. H. Eckfeld, Bd. of Edu., Wellsville, Ohio.

+1539—Woonsocket, S. D.—The Sanborn County Government received bids until 2 p.m., Oct. 5, for furnishing the local court house with Hocking Valley coal during the coming winter. Address County Audr. C. B. Jacobson, Woonsocket, S. D.

+1540—Davenport, Iowa—Bids were received until Oct. 2 for furnishing the Public Library with lump coal as may be required during the coming season. Address Librarian, Davenport Public Library, Davenport, Iowa.

+1541—Scranton, Penn.—The Scranton School District received bids until 7:30 p.m., Oct. 11, for furnishing the Scranton Public Schools with stove, chestnut and pea coal and the Technical High School Boiler Plant with No. 1 buckwheat until July 31, 1916. All bids were to be accompained by a certified check for $200. Address Supt. of Bldgs. and Supplies G. E. Haak, Administration Bldg., School Dist., Scranton, Penn.

+1542—Calvin, N. D.—Bids will be received until 6 p.m., Oct. 15, for furnishing the Grey School District with coal. Address Clk. Seacord Whitmore, Grey School Dist., Calvin, N. D.

1543—Frankfort, Ky.—The County Government will receive bids for furnishing coal required at the Franklin County Jail, Residence, Court House,. Poor Farm, and on the road work, during the ensuing year. Bids were asked on lump, nut, slack, and mine-run coal, and bidders were required to distinguish between the cost of the coal and delivery. Address Clk. Crawford Lee, Franklin County Fiscal Court, Frankfort, Ky.

1544—Nebraska City, Neb.—The Otoe County Board of Commissioners received bids until noon, Oct. 11, for furnishing approximately 100 tons of bituminous and 40 tons of anthracite coal. The bituminous coal is to be delivered at the boiler house at Nebraska City, and the anthracite to be f.o.b. cars at Dunbar, Neb. Address County Clk. Louis J. Stutt, Nebraska City, Neb.

+1545—Ocean City, N. J.—The Board of Education at this place received bids until 7 p.m. Oct. 11, for furnishing chestnut and pea coal in carload lots delivered in the bins at the school building as may be required during the ensuing year. Address L. E. Smith, Bd. of Edu., Ocean City, N. J.

+1546—Bridgeville, Penn.—The School Board at this place will receive bids until 8 p.m., Oct. 15, for furnishing approximately 5,000 bushels of coal during the ensuing year. Complete information and specifications may be had on application. Address Secy. W. C. Thompson, School Bd., Bridgeville, Penn.

+1547—Fremont, Ohio—The Public Service Department at this place will receive bids until noon, Oct. 14, for furnishing various kinds of bituminous coal in carload lots as may be required by the local Water-Works during the year beginning Oct. 15. Address Clk. Ralph R. Williams, Dir. of Pub. Serv., Fremont, Ohio.

+1548—Clearfield, Penn.—The Borough School Board received bids until 5 p.m., Oct. 12, for furnishing and delivering coal to the local school buildings as may be required during the ensuing year. Address Pres. A. D. Bigler, Clearfield School Bd., Clearfield, Penn.

+1549—Trenton, N. J.—Bids will be received until 2:30 p.m., Oct. 15, for furnishing and delivering to the pumping station approximately 3,500 tons of bituminous coal and the municipal building about 300 tons. Proposals must be submitted on regular blank forms, accompanied by a certified check for $500, and delivered in person to the city clerk. Complete details and blank forms may be had on application. Address Clk. Frank Thompson, City Hall, Trenton, N. J.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

+1100—Columbia, Mo.—This contract (p. 157), which provides for furnishing the University of Missouri with approximately 14,000 tons of coal during the year beginning Sept. 1, has been awarded to the **St. Louis Coal Co.,** on a B.t.u. basis at $2.05 per ton for Nos. 4 and 5 mixed coal and $2.30 for lump coal f.o.b. Columbia. The other bidders on this contract were the Consolidated Coal Co., St. Louis; Stonington Coal Co., Taylorville, Ill.; Whittle & Hockaday, Columbia, Mo.; The Shoel Creek Coal Co., Chicago; The West Virginia Co., Cincinnati, Ohio, and the Big Muddy Coal and Coke Co., St. Louis, Mo. Address Business Mgr. Edward E. Brown, University of Missouri, Columbia, Mo.

+1237—Hamilton, Ohio—This contract (p. 283), which provides for furnishing the Municipal Light and Power Plant with coal, has been awarded to the **Reliance Coal Co.,** Cincinnati, on Bluejacket bituminous from Kentucky. The contract involves approximately 11,000 tons of nut and slack coal and the consideration was $1.84 per ton. Address J. O'Toole, Municipal Light and Water Plant, Hamilton, Ohio.

+1261—Kenmare, N. D.—This contract (p. 324), which provides for furnishing the local Board of Education with coal during the coming season, has been awarded to **James Johnson.** Address Clk. J. M. Rohe, Kenmare, N. D.

+1270—Lake City, Minn.—This contract (pp. 324, 530), which provides for furnishing the Municipal Electric Light and Water Plant with approximately 300 tons of coal, has been awarded on Island Creek coal at $4.65 per ton for mine-run and $3.65 per ton for screenings, both quotations being f.o.b. Lake City. Address Supt. M. J. Stowe, Municipal Electric Light and Water Plant, Lake City, Minn.

1274—Des Moines, Iowa—This contract (p. 324), which provides for furnishing the Polk County heating plant with approximately 3,300 tons of coal, has been awarded to the **Carbon Coal Co.** at $1.90 per ton. The county solicited bids this season through letters direct to dealers, and conducted a series of very exhaustive tests before letting the contract. The pounds consumed, prices per ton, amount of ashes and number of hours of the test, were recorded with the following results:

	Lbs.	Price	Total	Ashes	Hours of Test
Bennett Bros.. .	164,350	$1.95	$159.12	44,370	334
Carbon Coal Co.	131,970	1.90	125.21	26,730	338
Evans-Lloyd. . . .	132,000	1.90	125.47	28,160	337
Dan O'Grady. . .	140,600	1.89	132.87	33,960	. . .

Address Board of Supervisors, Polk County, Des Moines, Iowa.

+1280—Burlingame, Kan.—This contract (p. 324), which provides for furnishing School District No. 7 in Osage County with coal, as may be required during the ensuing year, has been awarded to the **Central Coal and Mining Co.** at $2.90 per ton, delivered. Address Clk. F. M. Nelson, Burlingame, Kan.

+1285—Bay City, Mich.—This contract (pp. 324, 489), which provides for furnishing the County Government with coal for the ensuing year, has been awarded to the **City Fuel and Supply Co.,** at $3.40 per ton for steam lump. Address County Clk. C. L. Fox, Bay City, Mich.

+1306—Billings, Mont.—This contract (pp. 366, 530), which provides for furnishing the local School District with approximately 1,000 tons of coal, to be delivered in the bin, has been awarded to the **Crystal Ice and Fuel Co.** at $3.60 for No. 1 egg coal, $3 for Nos. 1 and 2 nut mixed and $2.60 for No. 2 nut. All coal is to come from the Bearcreek mines. Address Clk. A. J. Thorine, School Dis. No. 2, Yellowstone County, Billings, Mont.

+1329—Plainview, Neb.—This contract (p. 367), which provides for furnishing the No. 5 District School Board with nut coal, has been awarded to the **St. Anthony & Dakota Elevator Co.,** at $5.55 per ton. Address Secy. F. C. Holbert, School Dist. No. 5, Plainview, Neb.

+1334—Parker, S. D.—This contract (p. 410), which provides for furnishing the County Government with approximately 100 tons of Virginia splint coal has been awarded to the Schoeneman Bros. Co., at $6.15 per ton delivered in the bin. Address County Audr. O. M. Rasmussen, Parker, S. D.

1340—Livingston, Mont.—This contract (p. 410), which provides for furnishing approximately 200 tons of lump coal, has been awarded to **A. W. Wiles Lumber & Coal Co.,** at $4.75 per ton for 4-in. lump, and $4.25 per ton for 2-in. lump. Address County Clk. Chas. A. Burg, Bd. of County Comrs., Livingston, Mont.

+1342—**Boone, Iowa**—This contract (p. 410), which provides for furnishing the Independent School District with its coal requirements during the ensuing year, has been awarded to **Racko Bros.** at $3.25 per ton for the best lump Boone coal delivered at the schools. Address Secy. R. T. Duckworth School Dist., Boone, Iowa.

+1343—**Brazil, Ind.**—This contract (p. 411), which provides for furnishing the County Commissioners with coal during the ensuing year, has been awarded as follows: For County Jail and Orphans Home, **Hamlin & Heck Coal Co.,** of Brazil, screened bituminous, $2.15, and mine-run, $1.90; for the County Poor Farm, **John Weideroder,** of Center Point, Ind., screened bituminous, $2.24, and mine-run, $1.99. Address County Audr. W. O. Graeser, Bd. of County Comrs., Brazil, Ind.

+1347—**Sullivan, Ind.**—This contract (p. 411), which provides for furnishing the Board of County Commissioners with a year's supply of coal has been awarded to **R. R. Singer,** Sandborn, Ind., the gross consideration being $10,279. Address County Audr. W. S. Bicknell, Bd. of County Comrs., Sullivan, Ind.

1358—**Louisville, Ky.**—This contract (p. 411), which provides for furnishing the Peter & Burghard Stone Co. with their annual fuel requirements involving approximately 40 carloads, has been awarded to the **Scanlon Coal Co.,** at $1.45 per ton. Address Peter & Burghard Stone Co., 810 So. 13th St., Louisville, Ky.

1364—**Traverse City, Mich.**—This contract (p. 411), which provides for furnishing 7,000 tons of bituminous coal suitable for automatic chain grate stokers, has been awarded to the **Consolidated Coal Co.,** of Saginaw, Mich., on Saginaw washed nut, at $3 per ton delivered. Address Steward George B. Pike, Traverse City State Hospital, Traverse City, Mich.

+1365—**Pittston, Penn.**—This contract (p. 446), which provides for furnishing the local School Board with coal during the ensuing year, has been awarded to **Newcomb Bros.,** the complete list of bids received on this business being as follows:

	Stove	Nut	Pea	No. 1 Buckwheat
Newcomb Bros.	$4.22	$4.22	$3.18	$2.55
J. A. Fitzpatrick........	4.25	4.25	3.20	2.55
Joseph Kelly	4.25	4.25	3.20	2.55

Address Secy. James A. Joyce, Bd. of School Dir., Pittston, Penn.

1366—**Chisholm, Minn.**—This contract (p. 446), which provides for furnishing School District No. 40 with 2,100 tons of Pocahontas mine-run and 225 tons of Youghiogheny lump has been divided equally among the **Range Lumber Co., King Lumber Co.** and **Masaba Fuel Co.,** all of whom bid $5.25 per ton on Pocahontas and $5.35 per ton on the Youghiogheny, f.o.b. bins. Address Clk. M. Tripp, Independent School Dist., Chisholm, Minn.

+1381—**Chicago Junction, Ohio**—This contract (p. 447), which provides for furnishing the Board of Public Affairs with their annual fuel requirements involving approximately 2,500 tons, has been awarded to the **Loraine Coal and Dock Co.,** on No. 8 coal, at $1.05 per ton for ¾ in. and 95c. for mine-run, both prices f.o.b. mine. The contract runs until Oct. 1, 1916. Address Clk. E. K. McMorris, Bd. of Pub. Affairs, Chicago Junction, Ohio.

1383—**Miller, S. D.**—This contract (p. 447), which provides for furnishing the Hand County Board of Commisisoners with coal, has been awarded to **G. W. Van Dusen & Co.,** at $11 per ton for anthracite nut, and $7 per ton for bituminous coal the cost, including delivery as may be required. Address County Audr. D. A. Lewis, Bd. of County Comrs., Hand County, S. D.

+1387—**Missoula, Mont.**—This contract (p. 447), which provides for furnishing the City Government with coal, has been awarded to the **Rock Springs Coal Co.** on Round-Up lump at $6 per ton. The Perry Coal Co. bid $6.25, and the Inter-State Lumber Co., $6.50 per ton for the same kind of coal. Address City Clk. L. E. Harris, Missoula, Mont.

1389—**Yankton, S. D.**—This contract (p. 447), which provides for furnishing the Board of County Commissioners with Hocking Valley coal until April of next year, has been awarded to the **Fred Donaldson Co.,** at $6.60 per ton for screened coal, price including cost of delivery as ordered. Address County Audr. W. O. Nelson, Yankton, S. D.

1392—**Anamosa, Iowa**—This contract (p. 447), which provides for furnishing Jones County with approximately 150 tons of Christopher 6-in. lump coal, has been awarded to **O. P. Hanssen** at $1.40 per ton. Address County Audr. E. J. Hines, Anamosa, Iowa.

Contract Notes

Cape Cod Canal—The Cape Cod Canal management announce that the canal is now open for vessels drawing 20 ft.

Moorhead, Minn.—The contract for furnishing the local schools with coal during the ensuing year has been awarded to **Harris Bros.**

Blue Earth, Minn.—The contract for furnishing the local School Board with coal has been awarded to the lowest bidder, **August Conrad.**

Southern Ry.—It is reported that the Southern Railway has greatly increased its coal purchases in the Barbourville, Ky., district to probably 10% above the normal.

New Orleans, La.—The contract for furnishing the Touro Infirmary with approximately 1,200 tons of Black Creek coal has been renewed with the **C. A. Andrews Coal Co.**

Rugby, N. D.—The contract for furnishing the local schools with lignite coal has been awarded to **Vobey Shute Co.,** and **O. S. Orr & Son** were awarded the contract for furnishing bituminous coal.

Knightstown, Ind.—The Knightstown water-works has awarded its contract, involving approximately 2,500 tons of coal, to the **West Virginia Pocahontas Coal Sales Corporation** on their Panther mine-run coal.

Spain—An American consular officer in Spain writes that a business man in his district desires to represent American exporters of coal. New York City references given. Correspondence should be in Spanish.

Hankinson, N. D.—The Brightwood, Ind., School Dist. has awarded a contract for furnishing and delivering 75 tons of Hocking Valley coal to the Atlantic Elevator Co. Address Clk. H. A. Merrifield, Brightwood, Ind., School Dist., Hankinson, N. D.

Huron, S. D.—The J. F. Anderson Lumber Co. has been awarded the contract for furnishing approximately 400 tons of Youghiogheny screened lump, Pocahontas and anthracite coal to the city government. The prices were: Youghiogheny screened lump, $6.20; anthracite, $10 to $10.25; Pocahontas, $7.80 and $7.55.

Honolulu—A big deal is reported by the "Japan Mail" between the Hokkaido Tanko Kisen Kaisha and the Inter-island S. N. Co. at Honolulu for the supply of 130,000 tons of Yubari coal. The first shipment has just been made. This is the first big export of Japanese coal to Hawaii, which has heretofore bought Australian coal.

New Orleans, La.—The Audubon Ice Manufacturing Co., of this city, which uses about 3,000 tons of coal yearly, is in the market for prices and specifications on run of mine coal. Heretofore they have purchased directly at the mines, not on contract. Address General Manager Audubon Ice Manufacturing Co., Dublin and Hampson St., New Orleans, La.

Marshalltown, Iowa—The County and Municipal contracts at this place have been awarded as follows: For furnishing the city poor with lump coal, **Gregory Coal, Coke and Lime Co.,** $4.50 per ton delivered; for furnishing the County Heating Plant with steam coal to **Blackhawk Fuel Co.,** $2.75 per ton delivered; for furnishing the County Farm with mine-run coal, **Geo. O. Coburn,** $2.87 per ton.

Chile, S. A.—A firm in Chile desires to communicate with American exporters of coal suitable for household use. Imports will be made, if qualities and prices are suitable, in cargo lots. The firm is disposed to place a sample order for 500 tons at once. It is stated that steamers arriving at Chilian ports with coal would have no difficulty in obtaining return cargoes of nitrate or minerals for the United States.

Philadelphia, Penn.—The unusually large exports of coal continue to foreign ports, shipments being made in vessels of all kinds. Three sailing vessels were recently chartered to carry coal to Brazil. As a matter of fact sailing vessels are now being chartered for all ports. Another large order was placed for delivery in France amounting to 2,000,000 tons at a delivered price of $15 per ton, including freight. This coal it is understood will retail in France at from $22 to $27 a ton.

Little Rock, Ark.—The recent awarding of a big contract for coal to the Merchants Transfer Co. by the local school board has precipitated a legal fight. Chanceller Martineau handed down an opinion in which he said that the Board had acted "contrary to public policy" in making a contract with a firm of which one of its members was head, and that therefore the contract was void. The board has canceled the contract and the suit has been dismissed. It is understood that the contract is still open. Address Little Rock School Board, Little Rock, Ark.

COAL AGE

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Store Checks *vs.* Thrift

A very live question of great interest to most coal men. Let Coal Age readers express their opinions on the subject. Do it today.

THE president of a southern coal company stood and watched a long line of his employees—men (white and black), women and children — standing in the rain awaiting their turn to draw store checks to trade at the company store. Many of the best miners in his employ were represented in the line. Some interesting thoughts were fighting for place in the president's mind, but the foremost one was easily the most startling and ran about like this:

"What does it mean to my company to have to admit that so many of our men are unable to finance themselves and families in spite of full turn and a two weeks' pay? Isn't my labor a rather poor kind and am I not contributing to their condition by issuing store checks from daylight to dark? Wouldn't I have a better class of men if I could teach them the value of thrift instead of discounting their wages each day?"

This man had suddenly come face to face with a gripping problem of every concern that operates a company store on the store-check plan. It is a question that mining men must eventually tackle and settle—whether it pays to have a class of employees who have become so used to the check system that they cannot and will not save enough to tide them over a two weeks' pay or a class of men thrifty enough to do this and who will abhor the check system. We will all admit that thrifty men make the best employees. That is, we know in our hearts they do? because thrifty people buy homes and become settled citizens, and we know they are the best workers in the long run. But that doesn't settle the question, because people who run coal mines know how easy it is to make a good profit out of company stores. Therefore the pocketbook is "touched"—not in the usual way—and the response is evidenced by the too-frequent statement that "mine commissaries are necessities."

If commissaries must be run—and they are often necessary at mine communities remote from towns—should they not be considered secondary to mining coal and be run only to furnish the mining people with life's necessities at the lowest cost?

Can they not be operated for this purpose without the issue of store checks, which is such an easy method of trading that the weak brother can't resist it?

Isn't THRIFT *worth more than store checks?*

If it is, there are ways of reducing check issue so that men can be taught to leave their wages and draw real money twice a month; then pay the bills made at the company store and elsewhere.

Ideas and Suggestions

Mining Coal Without Profit

By Josiah Keely*

Should any worried and tired coal man pick up the *Coal Age,* and his eye light on the subject of this article, let him not be deceived into reading it for the purpose of obtaining a recipe. It is only a protest, and a futile one at that. If he continues to read he will recognize much of the talk he has heard in gatherings of coal men. But what are we going to do about it? Are we going to see the coal beds disappear right before our eyes, without profit either to the producer or to the consumer?

Acknowledging the futility of the protest, we want to hasten to explain that we are not trying to work up an old scare about exhausting the supply. Certainly it will be exhausted, and soon, too; but think of the criminality of letting a good thing go by without profit to anybody, the producer burying half of it in the gob and the consumer burning the rest with no regard to its possibilities. The finished product of millions of years turned back into its original energy, during the few generations of short-lived men, all because it is cheap—those who have it selling it for a song and those who buy it taking the hump and skin and leaving the carcass to rot on the plain.

A Good Chance Being Lost

But do not think we are grieving about the carcass. We leave that to the professional conservationist. What hurts our conscience is the fact that such a good chance to make money is being lost. Here is a chance where the conservationist and the capitalist could work side by side and receive an equitable share of the profits; yet coal is wasted and money lost.

Somewhere in the musty yesteryears someone coined the paradox "coal baron," and anyone with money, provided he lived in the East, came West or sent his money West in order to lose it with greater ease. A system has been built up on which by investing about a dollar a year a ton of coal can be produced, and the exciting game has been started of seeing how many it will take to produce that ton and what it can be sold for. The difference is called the return on the investment.

At first it seemed that if that difference was 10c., that meant a 10-per cent. dividend. Then it was discovered (by a few) that many other investments would return 5 or 6 per cent. without the risks of operating and selling; so this was taken out before calculating profits. Then it dawned on others that when the coal was worked out the original dollar would have to be extracted some way, and a depreciation was estimated and deducted. Then after it was borne in on the wise ones that the smaller the profit on each ton the more tons would have to be produced, the coal industry began to get under way, and the less they gained the more they seemed to be thriving. Thrift is too rare a virtue to pass unnoticed, hence the production tax, the leasehold tax, the income tax, the corporation tax, workman's compensation—and "damn 'em if they do and damn 'em if they don't."

Seeing Which Can Lose the Least

During the process of this evolution the more the investors protested that they were losing, the more those on the outside took it to be the deprecatory modesty of the oversuccessful, and crowed up. But like those of the herd pressing the leaders over a precipice, they were too far away to see them going down, and shoved in, to be in turn later pushed over the edge. Breaking away from this uncomplimentary figure of stampeding cattle, those who have escaped immediate destruction have settled down to an equally exciting scramble of seeing which one can lose the least, and working it on a strictly survival-of-the-fittest basis.

There is a popular game of cards which is being changed continually, either to conform to the development of the science or to stimulate the ennui of its devotees. Nullos was introduced for the player whose hand was so bad that it became a matter of interest how much he could lose, and the winning turned on how many tricks he could lose rather than how many he could take. Many of our operators in their zest for a game of some kind seem to have made it nullos. And so it goes desperately on, and the public is enjoying cheap coal at the expense of conservation and the capital invested.

We wonder sometimes whether that gentleman was pronouncing a curse or a prophecy when he said, "The public be damned!" Defining the public as all of us, it begins to look, to the more pessimistic at least, as if we were going to experience some such oblivion. One branch of the public believes itself sufficiently condemned when capital makes a successful enough organization for self-preservation, but is hastening that condition all the time by making organization necessary. There is not much question but that the condition of the coal industry is pretty generally recognized now by most of those engaged in it, and the knowledge is even permeating to the outer edges of the herd. Not that they have stopped pushing; but the new game seems to be to make a stake and get out of it.

Low Costs at First

Most of us have by now learned that the first half of an operation's life is when the coal can be produced most cheaply. It is mostly solid work near the opening and the coal is easily and quickly put on cars. All the equipment is new and efficient. Repairs are at a minimum. Men are plentiful, not only because they like something new but because they get a better turn and have a shorter distance to walk to their work. It is comparatively easy to arrange a dividend.

The cry is, "After us the deluge." It is even found that the immediate seeming profits can be increased by abandoning half-worked-out mines and opening new ones. This cheap coal is brought into direct competition with that of mines 20, 30 and 40 years old. Sometimes the new mines, when belonging to a consolidation, are carrying the cost of the old mines, which works as a partial solution, although there are several mines yet that are old, or going to be old, that belong to independent interests. It would seem that under present conditions the only hope for these single mines is to take sanctuary under the protecting wing of some consolidation operating new mines and to go over at almost the consolidation's own figures.

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*General manager, Cabin Creek Consolidated Coal Co., Kayford, W. Va.

As a general rule, economists tell us, price is regulated by supply and demand. The supply has been multiplied as the only way to make a profit on cheap coal—sell lots of it, supply and demand—an old, old saw, or see-saw! Unfortunately the small operation cannot curtail supply and live, and so all those public-spirited men who are howling about trust, monopolies, combinations in restraint of trade and the other necessity-made organizations which their souls hate are slowly but surely rounding up the stampede into something that any captain of industry would be proud to father.

Three Perfect Organizations

Someone has facetiously said that there are but three perfect organizations—the German Army, the Catholic Church and Standard Oil. These are widely differing organizations of opportunity and necessity, and no one can deny that they have showed us things. However, it is hardly my purpose to invoke a triumvirate of the Kaiser, the Pope and John D. Rockefeller to put the coal business on a proper footing. Probably a little less centralized effort would help some, but people never dreamed dreams and saw visions more than today.

Perhaps, after all, the dear public would rather milk one big cow; but they should not forget that in creating a model of heroic size it might assume the other sex with all its traditional disposition to chase. Anyway, if the cheap-coal curse is not solved by someone big enough to save the day it will be solved in the same old way. The enormous capital invested will shrink to a size equal to someone's pocketbook, and the best-filled purses are held by those who have seen the disaster of ruinous competition in time to keep some industries, at least, on a paying basis.

What Is the Remedy?

What are we going to do about it—get together or invite someone big enough to handle the job to come in and take it off our hands? Or have we waited until someone has already got far enough along to tell us what will be allowed for depreciated investment?

Just to wind up this talk, suppose someone big enough for the job already held the controlling stock in the controlling companies of the controlling states, and also controlled the price of competing fuels, such as oil and gas; and suppose this someone controlled railroads which in turn might manipulate car supply, and suppose in this time of oversupply of coal this big man controlled many of the industries which consume the coal, so that they would buy only the coal he controlled at a price he controlled over roads he controlled. Wouldn't that give us a jar? And suppose the big one would further reach out and make prices to those he did not control, so low as to be ruinous to all of us, even though we are selling cheap coal. What are we going to do about it?

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The Theory of Radical Change

An interesting line of thought was recently presented to us while listening to the address of a talented executive regarding practice in the operation of blast furnaces.

The fact that he was talking of the operation of blast furnaces in no way hinders the application of his point to any coal-mine executive, for practice in the operation of coal mines presents about as many varied and baffling problems as the running of a blast furnace.

But to get back to our speaker and his point.

He had made clear the progress of scientific knowledge as applied to his work and illustrated the difference in the practice of furnace masters (?) of other days, who knew that certain results were attained by doing certain things, but did not know why, as compared with present practice of modern executives who do know the "Why." He told about the man whose whole claim to success was based on his ability to introduce "radical changes."

This man had achieved a certain prominence by reason of a little knowledge coupled with successful bluff, and his method of execution was to call his associates together and state his intention to make a "radical change." This was usually accomplished by a disturbance in the whole organization, and the return to normal conditions was achieved a short time later by another "radical change," which put things back about where they were in the first place. The net result was a general unrest all along the line, because no one could tell when the next change would be made or what turn it would take. A short time later this man's company went broke.

There are, no doubt, a good many mining men who have seen the theory of radical change working out in the mining game. Sometimes it comes in the guise of a new manager, who has induced the owners to believe no success can be had unless there is a general shake-up, in which old and loyal employees are torn out root and branch without being given a chance for their alley. Sometimes it occurs in the physical sense, as when some overambitious salesman induces an operator to install machinery that is in no wise adapted to his mine.

No matter how it shows up, management that tries to achieve success with a system of radical changes is opposed to that which quietly accomplishes things without having to resort to such expedients.

The moral of the whole story can be summed up by saying that the executive who will be successful is that man who observes a rule of any well-ordered life—that radical moves (which nearly always are moves without due deliberation) are to be avoided as much as possible.

Doesn't the furnaceman's point strike you as a pretty good one?

⁂

H. W. Martin Believes That as Mines Get Deeper it will be found necessary to convey the air inward in airways used exclusively for that purpose, with no hauling or other work done on them. With such a pure supply of air, men will be able to work in a higher temperature and in greater humidity than can be done when the ventilation is not so good. As to the cost of such a system of ventilation, he does not believe it would be making too high an estimate by putting it as increasing directly with the depth; that is, a coal mine 2000 ft. deep would cost twice as much to ventilate as one 1000 ft. deep.

Motor Haulage and Side Tracks--II

By George S. Brackett*

SYNOPSIS—This is the second and concluding article on this subject. It deals not only with the arrangement of tracks at the junction of animal and motor haulage, but also with those to be built at the junction of main and gathering motors and where two or more straight-haul motors are employed.

When local conditions will permit, it is better to have the complete terminal side track located on the main or face headings and its parallels. This location is more easily converted from a terminal to an intraterminal parting. This transformation, however, is often blocked by insufficient pillar thickness or by the necessity of maintaining the air course. The disadvantage of this location is the increased distance given the mules in coming out from the butt-headings onto the main; but this can be compensated by shortening the butt-headings.

If the plans contemplate placing the individual intraterminal side tracks on the room heading, the extension of the motor haul involves, first, moving the terminal side track forward, and, second, the building of a side track in the room headings. The terminal side track that is located just outside of the first butt-heading should serve the purpose with little change for the first butt alone, when the terminal is later installed at the second or third butt-heading.

Lack of Forethought Delays Changes

Lack of forethought in these matters has often caused the extension of the motor road to be such an expensive proposition that changes are delayed until more than the cost of moving side tracks has been wasted in excessive animal haulage. The economy of animal haulage is contingent upon its confinement to moderate distances. It is unlike the gathering motor in this respect, and to maintain its economy the straight or main haulage must be continually advancing in steps of a few hundred feet.

Figs. 8 to 19 inclusive give illustrations of terminal and intraterminal side tracks. It is hardly the purpose of this article to criticize each plan separately, as such a method may be unjust in view of some of the many local conditions that make the adoption of that particular layout the most feasible. By illustrating the various plans without cavil, their adaptability to any set of local conditions must be determined for each particular mine. Under certain grades the simple runaround is by far the most satisfactory and most conveniently operated side track, both for motors and drivers. Under other conditions it is an abominable nuisance.

On the other hand, if conditions are such that the empties can be pushed into the empty track, the parting may be simplified. It is evident that where the grades are against the loads on the main headings it may be prohibitive for the mules to bring the loads out of the room heading; in fact the empties may drift into the room headings by gravity, saving the time necessary for the motor to pull them in and establishing this as the most favorable location for the parting.

At times the location of the side track most desired by the management is precluded by the air course. Where there are not sufficient grades to assist the motor on the partings, and where the main headings are producing room headings on both sides, it seems advisable that there should be five parallel face headings, the center being the main haul, the next to the right or left utilized for the side tracks, and the extremes for the air return. Four headings are sufficient if room headings are broken on one side only.

In advancing terminal workings it is frequently unnecessary to make a parting at every butt-heading. Assuming these butt-headings to be 300 or 400 ft. apart, there is no difficulty in working the first half of the second butt from a terminal side track at the first butt. In the meantime the first butt has reached its limit with the room cut through to the second butt, near the center of the block. To bring the coal from the upper half of the second butt through this room to the first butt, and thence to the side track, will not give an excessive haul. This will permit the lower half of the second butt to be pillared out completely. The removal of the coal from the lower half of the first butt may be delayed, but it is coal close to the side track, economical to mine and a good asset to have in reserve for the future.

Haulage Conditions Vary Continuously

There is still another consideration in the adoption of any standard side track for universal use in any single mine; that is, the haulage conditions vary from time to time. At times the capacity of the motor haul may exceed that of the drivers, and the mine capacity is limited by the number of cars the drivers can haul. Obviously that parting which is best adapted to the convenience of the drivers is the one to be selected. As the motor haulage increases with the development of the mine there comes a time when everything depends on the capacity of the motor, and we wish for the double-length side track with a center crossover, so that the motor when dropping the empties will be close to and ready to move off with the loads.

Under such conditions, without a second motor, the limit of the haul is reached. By extending it, we only reduce the production. We may be able to put on more drivers and maintain the same output for considerable advancement, although the gathering will not be economical. It is easier to waste money on many drivers than it is on two motors.

Generally speaking, I am more favorable to universally sacrificing motor convenience to the aid of the driver. One or two, or possibly three, energetic motormen are more easily watched and controlled than 10, 20 or 30 drivers scattered throughout the entire mine workings. Furthermore, the more side tracks there are conveniently located for the driver, the fewer drivers are coming into one side track, and better service from these men is the result.

Drivers waiting on the parting for others to come in from the longer hauls is a common defect of operation. The motor should bring loads to the tipple terminal and return with empties, irrespective of the standing loads at the tipple or any delays at that point. It should feed side tracks regardless of standing empties and proceed regularly on its duties independent of meetings or waits or temporary local troubles and delays in the mine. The drivers should bring their loads to the side track, take empties and go so far as possible without waiting for the motor or for other drivers.

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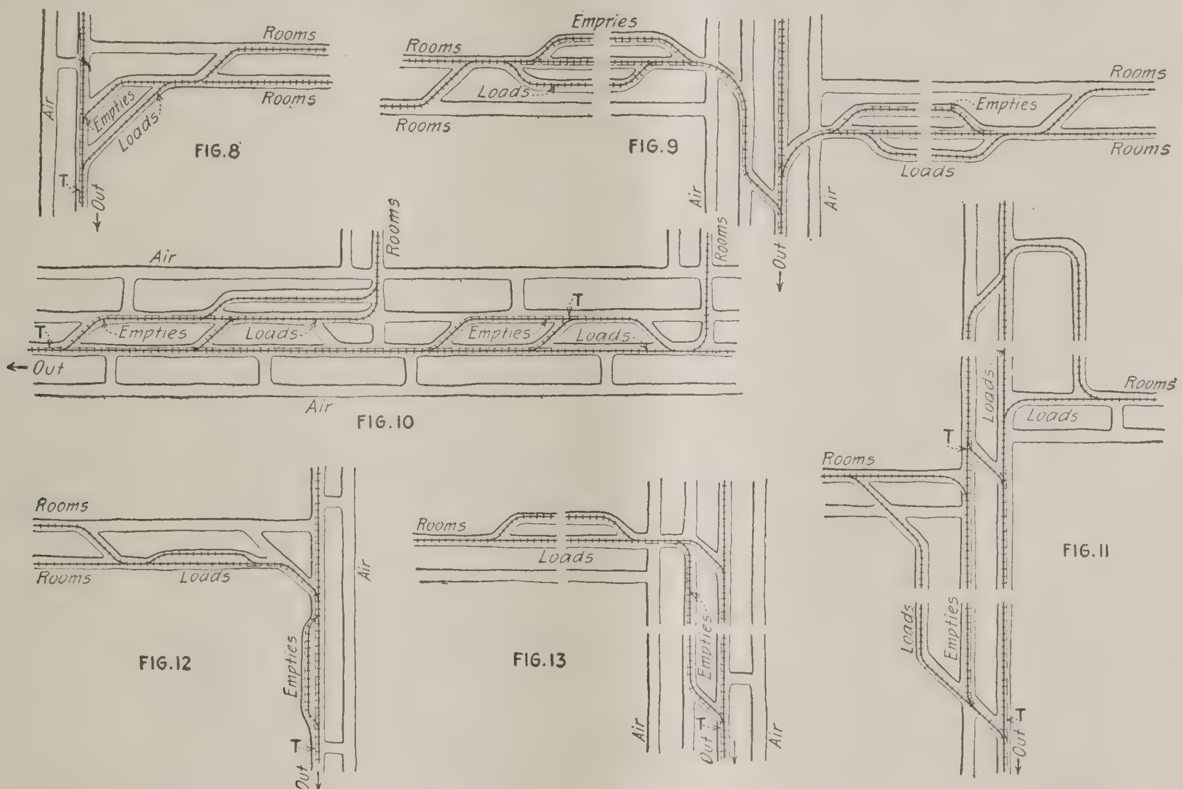
*Flemington W. Va.

For this to work smoothly there should be an ample equipment of mine cars and generous length of side tracks, with provisions at each for surplus empties. I have seen plants so designed that the motor could not get away from the tipple if any loads from the previous trip were standing nor could it feed the inside partings if empties remained there. There is no economy in operating under such conditions, and there is no reason why they cannot be relieved.

When motors are badly pushed for time and there is danger of increasing the number of side tracks to such an extent that the error of reducing the capacity of the motors is pending, I have concentrated the side tracks by bringing (for instance) coal from the first and second butt-headings to the first parting, and the third- and fourth-heading coal to the fourth-heading side track, either through standing rooms or along one of the face headings parallel with the main. It is not good mining to operate and maintain a side track for a heading which for any possible reason does not produce sufficient coal to keep one driver busy. This driver's haul had better be lengthened and the side tracks reduced.



FIGS. 8 TO 13. SIX TYPICAL SIDE-TRACK ARRANGEMENTS

There are so many different conditions that have to be met and solved that it is impossible to lay down an infallible set of rules, except that whatever is done must be done with a view to keeping every unit of the haulage system working regularly, efficiently and independently of the other units, so far as possible, barring unusual breakdowns and delays.

There are four considerations which determine the length or capacity of side tracks. These are (1) the daily capacity of the workings fed by the parting; (2) the number of trips the motor makes daily; (3) whether or not there is ample mine-car equipment, and (4) the number of loads the motor can haul in a trip.

The Most Important Consideration

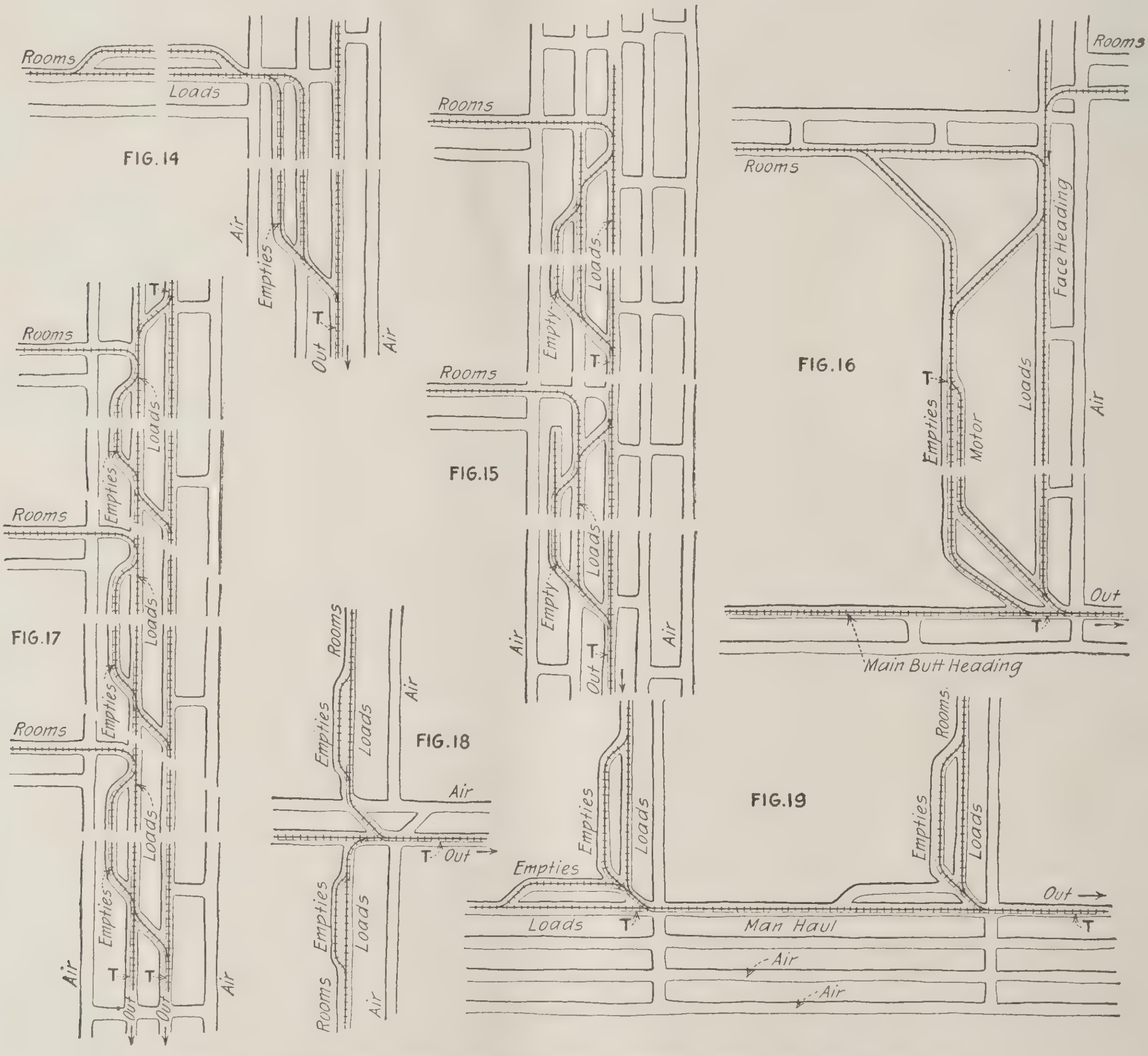
Granting the desired number of mine cars, the most important consideration is the tonnage or length of the trip the motor can handle. It should therefore not be required to feed a particular parting or associated group of partings until this length of trip has been gathered. Instead of the motor making the rounds of all the partings in turn, it should feed the heavy producing sections frequently, while the declining sections should be treated only as the full trip is gathered.

Practically the same general remarks pertain to the junction of main and gathering motors, with this general modification: The economy of gathering motors is not vitally dependent upon a short haul. The installation of the gathering motor greatly lessens the expense of advancing the side tracks to keep pace with the mine workings. There is, however, an economic distance beyond which the gathering motors should not be run. This distance varies with local conditions, grades and capacities of the motors. When this maximum is reached, there develops the necessity for breaking the haul into main haulage and gathering-motor haulage and the question of proficient side-track arrangement must be met. For the uninterrupted working of both these classes of units in the haulage system they should work independently of each other.

Whereas animal haulage must unavoidably fill the side tracks by numerous small trips of loads, the gathering motor may arrange to enter only when it has gathered the full capacity of the straight-haul terminal. Ordinarily the tonnage of the straight-haul motor will be greater than that of the gathering motor, which will involve the straight-haul motor in turn collecting the trip from several gathering-motor terminals.

The question of side tracks resolves itself therefore into whether it is necessary for the gathering motor to make several returns to the terminal in order to gather the required trip for the straight-haul motor and whether several gathering motors are coming into the same parting. To provide for the most complicated case where the loads will not drift into the parting by gravity, where they must be pulled in and where several landings must be made before the return of the straight-haul motor, the siding must be triple length, with two crossovers. It may not be advantageous for the gathering motor to clear the main parting of empties, but the usual room for surplus empties must be provided.

There are such numerous arrangements in the methods of gathering with motors that the planning of any side track is almost impossible unless all the conditions are known. They enter the rooms and pull the loads in some mines, and in others the miner delivers the load to the heading. In some the empties are placed by the motor at the face, and in others the miners push them up. One common arrangement is for the motor to deliver empties only on one heading and gather the loads only from the other heading.



FIGS. 14 TO 19. SIX SOMEWHAT COMPLICATED SIDE-TRACK LAYOUTS

GENERAL PRACTICE IN GATHERING

The grades on the heading may be so steep that they determine whether the gathering is commenced from the first or last room. The usual practice is to install a run-around at the mouth of the room heading in order to let the motor take its position in the rear (going in) of the empty trip.

The illustrations portraying the animal side track show the principal methods of arrangements with numerous modifications. Where the actual conditions and the duty required of the gathering motor are known, these will, with slight changes, serve the purpose. In fact the requirements of the terminals for animal haulage are more numerous than for gathering motors, as these have more power and can shift and push loads under conditions that would be prohibitory for a mule. On account of the greater distance covered by the gathering motor, the intraterminal side track is rarely used.

The next step in the question of motor haulage is met when the distance or tonnage gets beyond the capacity of one straight-haul motor. The installation of the second motor brings us to a decision on the following four points:

1. Whether or not to lay double track on the entire main haul used by two or more motors in common.

2. Whether or not to arrange for the motors to meet at intermediate points, thus splitting the distance into several parts.

3. To provide intermediate passing points, or

4. Whether or not the mine cannot be divided into sections so that each motor shall work a different part and, by a system of signals or the word of a trapper, keep them from colliding on that part of the track used in common.

There is no question concerning the advantage of the double track—it is the surest way to eliminate accidents. Its disadvantage, and what influences most installations, is the expense, and if something nearly as good can be devised with less cost it will be the most popular. Hence the majority of single-track mines. The meeting of the two motors practically answers the same purpose with little loss of time during normal running, provided the meeting place is located at such a point that the inside motor or motors can work the side track on or about on even time with the outside motor. This is not difficult. The advantage is also that there are fewer empty mine cars and loads on the main haul and outside. Furthermore, there is considerable relief where there is a shortage in mine-car equipment.

I have been using this system for many months on a long motor haul. The double track was out of the question, and the scarcity of mine-car equipment necessitated the practice which held the least number of cars on the haulage road. In deciding between meeting and passing at some intermediate point there is little choice, except in the number of mine cars required by each system.

For two motors only, the kind of side track is a simple question when only meeting or passing is required, but as the haulage enlarges and two or more inside motors are necessary, with various times requisite for their trips, the meeting place becomes more complicated and provision must be made for all the motors to work independently of one another. A clear and distinct understanding of just what the side track is required to accomplish is the principal part of its design.

Two Motors Using One Track Is Dangerous

As for two or more motors using part of the main single track in common, without a distinct passing or meeting point, the practice cannot be too strongly condemned. Without adequate electric signals it is dangerous. Even with signals it cannot be operated without great loss of time in waiting. Just as having too many drivers coming into the same motor terminal results in inefficiency, so too many motors coming into the same point can result in nothing but waste of time. One driver from one parting will haul more than half the coal delivered by two, and the average per driver decreases as the number increases on the same side track.

The same applies just as forcibly to several motors on the same terminal at the tipple. There must be delay waiting for the others or in finding out where they are, and always doubt as to where the others are going. This is too frequent at many mines to require much comment, except that it is always policy to keep more than one motor off one track, and if more than one is needed to handle the tonnage, break the haul into parts, allowing one motor only to land on the tipple.

Motor side tracks and motor haulage in general are so dependent on the individual conditions existing in different mines or in different localities in the same mine that a fund of information on what can or may be done is needed in order to adopt the best plan for any particular set of circumstances. The ventilation must never be lost sight of even if it be feasible to occupy both heading and air course at the present time. Whether the two headings will be needed in the future before the side track will be abandoned must be determined.

The economy forced upon the operators in the past few years has been such that ventilation by overcast at each butt-heading has been avoided by the mine management. In its stead a practical and cheaper system of check doors has been adopted and as long as continuous circuit is practicable is continued in effect. While this kind of ventilation is in use it is possible that the air courses at the junction of the butts and mains may be used temporarily. But no such temporary conditions would justify the location of the side track so that the air course cannot be utilized for air when occasion demands.

It Is Unwise To Estimate the Life of a Side Track

It is hardly advisable either to estimate just when a certain side track will be abandoned or a certain section worked out. Regardless of the panel working and pillaring plans, there are sections that cannot be worked as fast as desired and others that it is not desirable to exhaust. Bad top and wet places retard working, and sometimes even prevent it. Sections with excellent mining conditions and close up to side tracks may be held advantageously for other times. The side-track location and design should be such as to meet these conditions, without enhancing the cost on the rest of the mine. Experience is one of the best, although one of the severest, teachers; and assets of developed but unworked coal, particularly in the better sections of the mine, are almost invaluable, and I have seen them husbanded as a miser hoards his gold. In severe labor shortages it is with much satisfaction that we display our array of "good places" to prospective boarding bosses with "maybe ten men."

This is digressing somewhat from the subject, but it emphasizes the necessity of flexibility in the proposed system of motor haulage and the need of its adaptability to all the crooks and turns of good mining practice. If we plan to work our panels with a long pillar line we may be doomed to disappointment. Through careful acquaintance with mine conditions and the labor and market situation and the location and changes that can be made in the motor side tracks, the electric haulage may be adapted to work the mine more advantageously than the most economic mining plans.

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One Mine Inspector Recorded an Explosion that occurred in a place which he was assured had been examined a quarter of an hour before the accident. Stringent inquiries were made, and it was discovered that a miner took a safety lamp down, but as soon as he reached the face of the heading he struck a match to light an open lamp, and immediately the firedamp was ignited. Further inquiries disclosed the fact that at that particular mine the management had so feeble a grip of the discipline that orders were openly defied. In cases of this sort the management is perhaps more to blame than the miner.

Railway Coal-Storage Plants*

SYNOPSIS—Description of a proposed railroad storage plant on the Louisville & Nashville R.R., which involves some unique features. Also some comments on the current practice in general on this type of construction.

Two widely different types of coal storage and handling plants for railway coal supply are described below, and in both of these the coal is stored in open piles.

The deterioration of coal in open piles is not a serious consideration, according to a report to the International Railway Fuel Association by a committee of which Hiram J. Slifer, consulting engineer, Chicago, is chairman. But the coal should be carefully studied to determine the best methods of preventing spontaneous combustion, and it is advisable to store that from different fields in different piles. The report stated that various investigations have shown that with most coals there is very little difference in the heating value, whether stored in the open or under cover, while objections to a covering are the increased cost of the plant and probable interference with the handling of the coal.

Louisville & Nashville R.R. Plant

The coal-storage plant designed for the new Radnor yard of the Louisville & Nashville R.R., at Nashville, Tenn., comprises a semicircular coal pile, which is divided by a semicircular track for a locomotive crane.[1] The coal can be filled in over the ends of the track, leaving only a pocket for the crane. The general arrangement is shown in Fig. 1. This plant will serve both the Louisville & Nashville and the Nashville, Chattanooga & St. Louis railroads. The storage pile will contain about 12,300 tons for the former and 8,200 tons for the latter, while the coaling station for locomotives will have a 600- and a 400-ton bin for the two roads respectively.

The crane will travel on two tracks of 29¼-in. gage, spaced 18 ft. 11 in. c. to c., and will be mounted on four four-wheel trucks, thus having ample stability for swinging. It will have a long braced steel boom, carrying a 5-yd. grab bucket and having a maximum radius of 110 ft.

Coal will be received in hopper-bottom cars and dumped into a track pit, from which it may be fed directly to the vertical bucket hoist of the coaling station, or it may be picked up by the locomotive crane and deposited on the storage pile. To supply the coaling station the crane takes coal from the pile and drops it into the pit, filling it to such height that the coal will flow by gravity into the automatic feeders of the bucket hoist.

The coaling station will be of reinforced concrete, with a hoist tower of structural steel. It will serve three engine tracks. In addition to the coal bins it will have storage for 75 tons of green sand and 10 tons of dry sand. The coal and sand will be raised by duplicate balanced buckets at the rate of 125 tons per hour for both buckets. It will be provided also with four steel weighing hoppers of 15 tons' capacity. The crane will be operated by steam and the hoists by electricity.

A coal-storage and coaling plant of the same type is in operation at Paris, Ky. This has a crane of 80-ft. radius (with 3-yd. bucket) and travels on a single track of 15-ft. gage. The coaling station has only a single bin of 400 tons' capacity, and has no weighing hoppers or sand-handling equipment. A similar plant with 110-ft. crane and 600-ton bin is being installed at Lebanon Junction, Ky. The plant at Paris has not been in use long enough (and has not handled enough coal) thoroughly to test the operation and advantages of the scheme, but it is satisfactory as to its mechanical operation. The only special features of the coaling stations used in connection with these storage plants are the open-back dumping pit and the unusual depth of the feeder and bucket-hoist pit. The cranes were built by the Link-Belt Co., and the coaling-station machinery by the Ogle Construction Co., of Chicago. The plants were designed and built under the direction of W. H. Courtenay, chief engineer of the Louisville & Nashville.

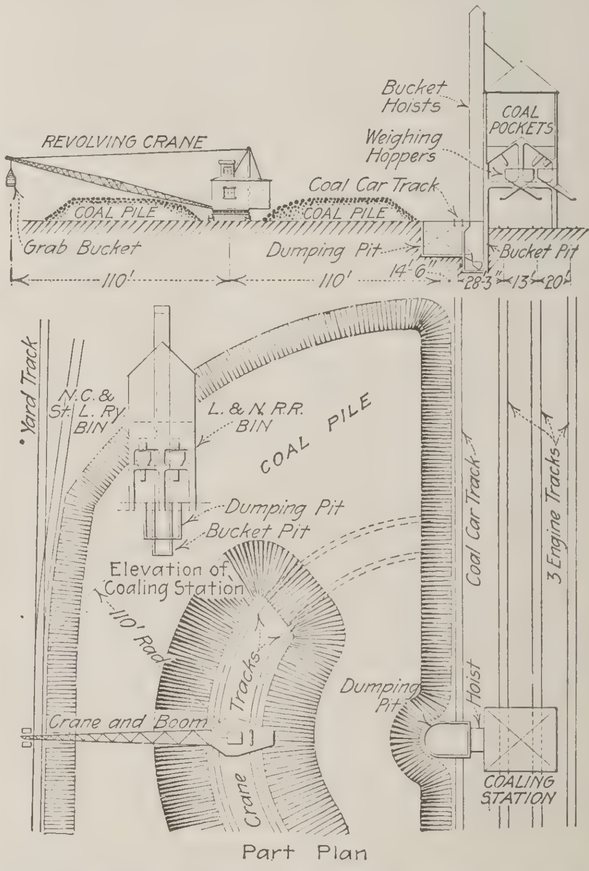

FIG. 1. COAL-STORAGE AND COAL-HANDLING PLANT WITH 110-FT. REVOLVING CRANE AT THE RADNOR YARD, LOUISVILLE & NASHVILLE R.R.

Southern Ry. Coal Storage

Several reinforced-concrete coaling stations have been built recently by the Southern Ry., and at three of these provision is made for storing a supply of coal on the ground and handling this by means of drag-line buckets. The storage piles contain from 3,000 to 10,000 tons each, with a depth of not more than 10 ft. The general arrangement of the plant is shown in Fig. 2.

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*Abstracted from the "Engineering News."

[1] This system, with a long-radius locomotive crane running on circular (or segmental) tracks, is patented by the Link-Belt Co., which supplied the cranes for the Louisville & Nashville R.R. here described.

The methods of delivering the coal to the storage pile and returning it to the coaling station are quite different from those at the Nashville plant already described. The railway cars dump the coal into a track hopper, from which it is fed by a loading device to an elevating conveyor of the bucket type. This delivers the coal either to the storage bin of the coaling station or to a gravity chute which discharges it at about the center of the storage pile. From this point it is distributed over the area of the pile by the drag scraper, which also delivers coal from the pile to the track hopper and elevator for the supply of the elevated coaling bin.

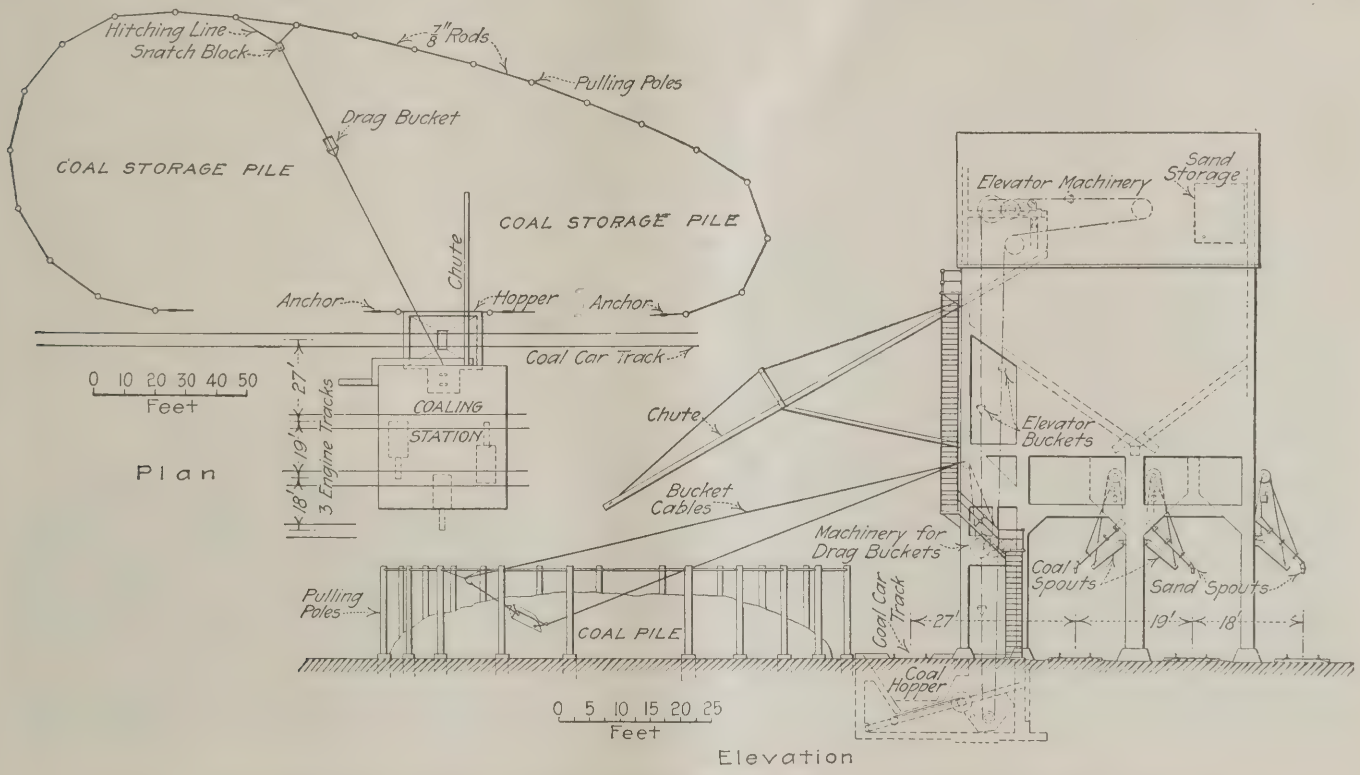

FIG. 2. COAL-STORAGE AND COAL-HANDLING PLANT WITH DRAG-LINE BUCKETS, SOUTHERN RY.

The storage pile is of irregular form and is surrounded by poles about 20 ft. apart for the attachment of the bucket lines. At the first plant these poles (termed pulling poles) were 20 ft. high, but it was found that poles of such height were not practicable without the use of outside guy lines, which would be undesirable. The height was reduced, therefore, to 12 ft. The poles are made of steel H-beams, each set in a concrete base. They are connected at the top by a row of 7/8-in. rods.

The operation of the scraper bucket is effected by means of a double-drum friction hoist driven by a 25-hp. motor geared directly to the countershaft. The hoist and motor are mounted in a housing in the coaling station or on a steel platform over the coal-receiving track. From the drum a steel hauling cable extends to the bail on the mouth of the bucket. The backhaul cable extends to a block hitched to one of the posts and thence to its attachment to the back of the bucket, as shown.

With this equipment the operator can take the coal delivered from the chute and distribute it between this point and the post to which the snatch-block is attached. To reach the space between two posts, lines may be fastened to them and the snatch-block attached to the lines, as shown in Fig. 2. By shifting the block from pole to pole any point within the coal-storage area can be reached.

When it is necessary to supply the bin of the coaling station, the position of the bucket or scoop is reversed, its mouth (or open end) being turned toward the coaling station, as in Fig. 2, the backhaul cable then becoming the hauling line. In this way coal is carried from the storage pile to the receiving hopper, from which it is fed to the bucket conveyor and elevated to the bin. Each plant is equipped with at least two of these buckets, thus minimizing the work of changing blocks and tackle.

The coaling station shown in the drawing serves three engine tracks. The main bin has a capacity of 955 tons, and there are three scale pockets of 15 tons each, making a total of 1,000 tons. It has also a sand-storage bin, with delivery spouts, so that engines can take coal and sand at the same time.

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A Steel Gas Reservoir Exploded in the building of the Society for the Prevention of Cruelty to Animals in New York City recently. The tank, used for asphyxiating dogs and cats, is a steel chamber 5 ft. high, 5 ft. wide and 10 ft. in length. The cats to be killed are placed inside the tank, and illuminating gas from the city mains is discharged into it. In the published reports of the accident the remarkable cause assigned for the explosion is that the sharp claws of the cats inside clawing the sides of the tank must have produced a spark and ignited the contents. It is extremely doubtful whether a material no harder than a cat's claws rubbing on soft steel could ever produce a spark. It may be suggested, however, that cat's fur when properly agitated is one of the oldest and best-known sources of electric sparks. If the tank had been filled with illuminating gas alone, any sparks produced would of course have been harmless, since there would have been no oxygen with which the gas could ignite. Probably, however, as the tank at the start of the process is filled with air as well as cats, a gradual mixture takes place between the air and the gas as the latter is discharged into the tank, and thus an ignitable mixture may be formed. The mixture ignited was evidently not that which could produce complete combustion or the explosion would have been of greater violence.

Trees in the Life of a Coal-Mining Community

By Karl B. Lohmann*

SYNOPSIS—The suggestion is made that great benefits are to be derived from a policy where the liberal planting of trees in and about coal-mining camps prevails. Among the results are added health, added efficiency and added happiness.

A writer tells of a 7-year old Arizona girl who stood dancing under a scrubby cottonwood tree clapping her hands to the rustling leaves. The stranger said to her mother, "Your little girl seems to be much delighted by the tree." "Ah, yes; she may well be so," said the mother. "It is the first tree that she has ever seen."

Fortunately not many of us have lived under circumstances like that. Yet often, with our tree-embowered mountain slopes, valleys and river banks, do we fully appreciate our heritage? Too often we pass trees by or seem to look beyond them, but somehow we look too seldom into them, as it were. They oftentimes become so much a part of our daily lives that we scarcely think of them any more than we do our everyday language. The influence of trees is none the less real; and just as truly as we should miss the power of speaking were it suddenly removed, in the same way we should feel keenly the part played by trees were they no longer with us.

MANY COAL-MINING COMMUNITIES TODAY ARE PRACTICALLY BARREN OF TREES

For those people who have rocked and tossed on the ocean for several days, during which time as far as they might look there was nothing to see but sky and water, how at the sight of land again their hearts thrilled in beholding vegetation that never possessed for them a lovelier green and trees that never seemed more beautiful!

Without verdure, the expanse of ocean and sky at the time was perhaps sufficiently inspirational. It is much the same with the prairies. One can look over them and see for at least twenty miles in any direction without a shrub or tree to interrupt the eye. It fills one with an appalling sense of boundlessness. Yet such inspiration, either of the prairies or of the ocean, cannot compare with our simple woodlands, the soul-spirit of which is the tree.

TREES REGARDED WITH DISFAVOR

Curiously enough, when our first coal communities were established, the surrounding trees were regarded as foes to be vanquished rather than as friends to be protected. As a result they were cut down ruthlessly, with no thought to the future. Not only, therefore, have our first great forests been denuded through the coal regions, but many coal-mining communities as they have grown up have done strangely without forest denizens in their midst. All of our towns were essentially tree communities when they were first settled, and as a result we have today the anomaly of many coal-mining villages practically without trees.

Perhaps the first question we are likely to ask ourselves is what particular good trees may possess in the life of a coal-mining community. In the first place, where intelligently grown, they have economic value. For instance, they add to the value of property. Real-estate people all over the country are aware of this, and whenever they want to lay out a large piece of land into building lots, they usually accompany the development with trees, because a person who is choosing a home, either to buy or rent, will be attracted to the home with surroundings that are pleasant. The street that has trees on it will without a doubt be preferred to the one that has none. So that either from the standpoint of the one who sells or the one who rents, a few dollars' expenditure in trees is well worth while.

More important still, trees have health value in the life of a coal-mining community. Everyone knows that trees are restful to the mind and soul, that they help to modify heat in hot weather, and hence add to the comfort as well as to the health of the people. Then, too, they help to purify the air by absorbing the carbonic acid gases that are exhaled by man, giving back pure oxygen that man needs.

Trees are not only of value economically as well as healthfully, but are of value aesthetically. First, this is true because of the beauty interest that the trees afford at all seasons of the year—in form, texture and color. Second, it is equally true because of the power trees have in uplifting the people. When a coal miner is compelled to choose between the doorstep of his home on a summer evening, where nothing but desolation crowds about him, and the saloon, where light, fellowship and good cheer abound, is it any wonder that he very commonly chooses the latter? Improve the surroundings of the miner's home, help him and show him the proper use of trees—how to make his dwelling a more attractive place—and his temptation to drink will be immensely decreased.

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*Landscape architect, Wilkes-Barre, Penn.

Also we might ask ourselves how trees might be most appropriately put to use in the life of a coal-mining community. In the immediate home surroundings of the miner, the use of trees commonly understood as such would often be quite absurd. Clearly it would not do for a person to nurture a mighty growing oak in a small backyard, together with a dozen equally luxuriant friends of the forest. So our choice of plants in this case must be confined generally to the very smallest trees, even venturing into the world of shrubs, which after all are essentially nothing less than diminutive trees.

No plantation should be the result of a hit-or-miss scattering of these over the home surroundings. We must strive to provide areas in the yard for special purposes, much like certain rooms in the house that are set apart for particular functions. For example, if there is to be a vegetable garden, then a piece of ground for such purpose ought to be set aside. If there is opportunity for a garden or open green space beside the house, every means should be availed of to make it for what it is intended. Successfully designed, the development of such an area out of doors may reveal privacy, permanence, peace, restfulness; may invite one in summer to outdoor life, may present views on a small scale and promise to grow lovelier and more valuable every year.

Trees Most Suitable for Planting

Not only may there be practical use for the trees in serving to improve the immediate surroundings of the miners' homes, but they may admirably help to make attractive the streets of a coal-mining community. Their choice for this purpose, again, is governed by certain limitations. There is for example the question of hardiness; that is to say, trees which are chosen must be able to endure the climate, the soil, drought, smoke and dust. They must have strength to resist winds, sleet and snow, and they must have the ability to endure transplanting and to propagate easily. The trees must be immune from insect attack; they must have straightness and symmetry; they must give shade; they must be clean, and they must be long-lived. Examples of the best would include the oriental plane, the American elm, the red oak, and the sugar, as well as Norway maples.

And useful as trees may be in the beautifying of yards and streets, they can be put to no more worthy service than in helping to beautify pleasure grounds in a coal-mining community. Trees, indeed, are an invaluable accessory of most pleasure grounds and play areas.

The usefulness of play as well as the need for it around school buildings is generally admitted. There ought certainly to be more general provision of the kind. Trees intelligently planted will be fruitful, not only in making the school grounds a pleasanter place wherein to play, but also in adding to the beauty and attractiveness of the school.

A great many coal-mining villages, moreover, possess other places of work besides the school, and they should be remembered in the way of pleasure grounds for their workers. For example, there are factories where often it would be practicable to provide near-by park areas with plenty of shade and verdure, where employees might spend health-building noon hours. Pleasant grounds to look out upon occasionally help to ingratiate further the employer in the hearts of his toilers.

Where To Plant Trees

The typical center of all workaday activities in a coal-mining community is of course the coal mine. The rumble and tear of breakers and tipples, with their outlying workings, is familiar to those who live in such communities. What about introducing trees into the surroundings of those breakers? Most breaker-yards from the standpoint of appearance are certainly chaotic and desolate. Some few mine officials insist that "breakers are breakers, and you cannot make anything else out of them." Nevertheless attempts are being made, and more will be made, to change the appearance of such surroundings. Efforts of this kind will benefit all concerned—the pride of the owners and operators and the comfort and pleasure of the men who emerge from the darkness of the earth. The green of the trees will help to reignite the latter's hope and enthusiasm in life, to say nothing of what it will do ultimately toward helping in the uplift of living in the coal-mining communities.

IS IT ANY WONDER THE MINER PREFERS THE SALOON TO THIS?

Urgent as may be the need for trees in creating pleasure grounds associated with the various places of work, the call for them in helping to create public breathing places, playfields, park areas for the community at large to enjoy is equally pressing. The bordering lands just outside of the village or town, or those areas still unused and suitable within, ought to be preserved and developed for such purposes. This is not only a timely suggestion for the people who are to enjoy them in this day, but it is a provision as well for those still to come. Nearly every community has hope of growing and developing. Why not initiate early in the life of a mining town a park policy that will make for the beautification and betterment of that future community?

And for this kind of development, or any others, the earlier that requisite trees are planted the sooner will be enjoyed their maturity as well as fruitful service for good.

The value of trees in the coal-mining region is by all means real—the need of them unmistakable. They have economic value, they have health-giving attributes, and they are endowed by God-given beauty. Let us pledge ourselves, therefore, to the very prompt reinstatement of these, our forest friends. And in so doing we shall contribute to a score of mining towns and villages added efficiency, added health and added happiness.

Coal Situation in the Warring Countries

The American Association of Commerce and Trade in Berlin makes the following interesting analysis after a year of the war:

The coal production by metric tons of the important European countries in 1913 is shown in the following figures:

Country	Coal	Brown Coal	Total
Germany	191,511,000	86,475,000	277,986,000
Great Britain	287,044,000	....	287,044,000
Austria-Hungary	17,762,000	35,663,000	53,425,000
France	40,129,000	793,000	40,422,000
Belgium	22,846,000	....	22,846,000
Russia	30,745,000	....	30,745,000

The coal output of Great Britain is exceeded by the United States only. The British exports in 1913, also in metric tons, were as follows:

France	12,775,000	Denmark	3,034,000
Germany	9,646,000	Norway	1,900,000
Italy	8,952,000	Spain	3,648,000
Russia	5,999,000		
Sweden	4,553,000	Total	50,507,000

The British output in 1914 was reduced by the following causes:

1. Approximately 200,000 miners joined the colors.
2. Lack of timber used for mines, which was declared as contraband by Germany in regard to shipments from Russia and the Scandinavian countries.
3. Difficulties in transportation.
4. Strikes.

Therefore until December, 1914, exports decreased by one-half as compared with 1913, and for 1915 the decrease in domestic consumption is estimated at 27,000,000 tons on account of reduced activity in the industries, and the decrease in total production is figured at 53,000,000 tons. Coal exports in time of peace take place from South Wales via Cardiff, and from Newcastle and the Tyne shipments are made to London, Germany, the Scandinavian countries and Russia.

Decreased outputs resulted in higher prices and in an embargo on all exports, excepting to the British colonies. In order to put an end to continued rise of foodstuffs, increased cost of labor and increasing cost of coal, maximum prices for coal may be established. The Scandinavian countries seem to have insured their English coal supply by energetic measures.

Different, however, is the situation in Italy, which country, without any notable coal production of her own, in 1913 imported from England 9,000,000 tons and from Germany (including coke) 2,000,000 tons. Shipments from England in the period from January to May 11, 1915, were 1,250,000 tons less as compared with the same period of former years, while shipments from Germany increased by 100,000 tons.

Judging from all indications, it will be difficult for England to satisfy Italy in the matter of coal supply, inasmuch as freight charges caused by the lack of steamers have considerably increased. According to information received from Rome last March, increase in ocean freight rates varies from 600 to 700 per cent., and it is expected that the announced American shipments will be very expensive for the same reason.

At a consumption of normally 61,000,000 tons the domestic production reaches 41,000,000 tons per year. Imports take place from England (12,000,000 tons) and Germany (5,000,000 to 6,000,000 tons), with the remainder from Belgium.

The territory in northern France occupied by German troops furnished in normal times 27,500,000 tons, and the southern districts of St. Etienne, Alais and Le Creusot only 12,500,000 tons. Considering the lack of labor and difficulties in transportation at the present time, the entire French coal production can be estimated now at 6,000,000 instead of 41,000,000 tons, as in normal times.

Shipments from England are decreasing, and in the period of January to May 11, 1915, shipments decreased by 1,000,000 tons as compared with the same period in times of peace. The Paris *Temps* states that shipments to Paris in the second half of November, 1914, amounted to 80,000 tons as compared with 300,000 tons, which are required normally.

Coal prices and ocean freight rates have continued to rise since January, 1915.

European Russia has a peace production of 31,000,000 tons of coal per year, while imports in 1913 amounted to 9,000,000 to 10,000,000 tons, of which 6,000,000 came from England and 2,500,000 from Germany.

Since the coal district of Dombrawa, in Poland, has been in the hands of the Germans for some time a loss of 7,000,000 tons must be figured, while the production of the coal district of Donez (Charkow) has decreased by 30 per cent. Since English imports via the Baltic and the Black Seas have ceased entirely, there remain for domestic consumption approximately 20,000,000 tons only.

On the other hand, it should be remembered that in Russia oil, wood and peat are used to a great extent in place of coal.

For reasons that shipments of American coal via Vladivostok are very expensive, owing to high cost of transportation via the Trans Siberian railroad, it is evident that the Russian coal supply is rather limited.

In spite of increasing production during the war, the output is remaining behind normal. Exports to Italy, France and Russia have ceased, while considerable shipments are being made to Austria and other neutral countries, such as Sweden, etc.

English imports, of course, usually amounting to from 9,000,000 to 10,000,000 tons per year, have stopped. The importance of coal exports in exchange for foodstuffs manifests itself now in the trade with Rumania, as it formerly did with Italy.

As things stand today Germany and Austria dominate the coal market in northern France, Poland and the Balkan states, and it seems that they are able to meet the demand without any difficulty.

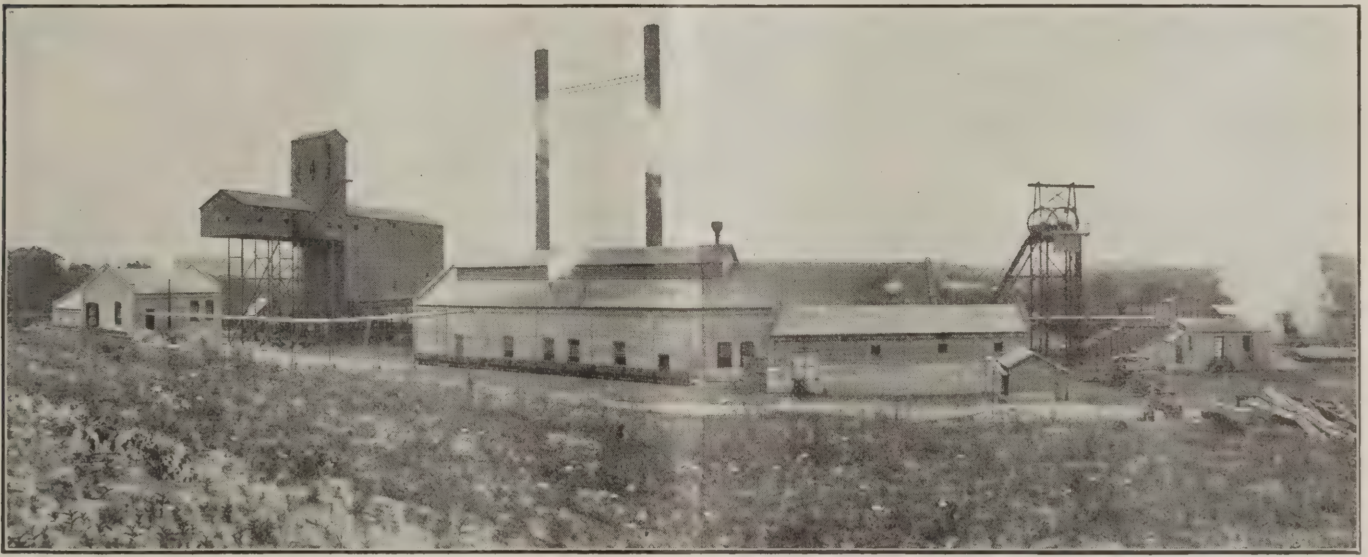
Switzerland is not furnished now with coal from France or Belgium, but is well supplied from Germany. Germany need not fear a coal famine.

An Interesting New Pennsylvania Coal Mine

By R. G. Johnson*

SYNOPSIS—Description of a plant where the construction work was designed and carried on with an idea of permanency. The shaft is concrete-lined and fireproof. Its general design is unique. The surface equipment at the mine is the last word in uptodate engineering.

Modern shaft-mining plants designed for permanency are in most locations as economical today as the plant which was formerly considered a 15-yr. or 20-yr. installation. Concrete-lined shafts with steel buntons in many parts of the country will cost no more than timbered shafts. Steel construction will cost only little more when erected over the shaft than the timber headframe, tipple and bins. It must seem folly, therefore, in a long-time operation to put up timber headworks in any but a timber country, remote from the steel-making centers. Modern power-plant equipment, with its many steam- and labor-saving accessories, is higher only in first cost and soon more than pays for its incidental increase in price. All along the line of mining-plant requirements the higher first-cost argument against the better equipment is receiving its death blow.



SURFACE PLANT, BERRY NO. 3 MINE, BAIRDFORD, PENN.

The Ford Collieries Co., of Detroit, owning and operating mines with a daily capacity of 5,000 tons in the Freeport seam of coal about 17 mi. north of Pittsburgh, Penn., was firm in its belief that the better equipment is the cheaper when planning the construction of the plant for its new Berry No. 3 mine, located at Bairdford, Penn., about 3 mi. from Curtisville on the Bessemer & Lake Erie R.R. In this immediate section the upper and lower Freeport seams come together about 200 ft. below the surface, the two being separated by a 5-in. parting of slate. The country is not a wet one, as far as sinking goes, but the coal has some water in spots.

The area tributary to the new shafts is about 2,500 acres, the seam averaging a little more than 6 ft. in thickness. The floor of the coal is generally regular in grade and the roof is of firm sandstone, so that other roof support is seldom required. Various analyses of the coal show it to conform closely to the record given below:

Moisture	0.99	Volatile carbon	37.58
Sulphur	0.82	Ash	4.64
Fixed carbon	57.78	B.t.u.	14,709

About 25 per cent. of the output of its various mines goes to the coal company's allied industries in Michigan, the remainder being shipped to various railroads for locomotive fuel.

General Design of Shaft

At the start, A. R. Pollock, the general superintendent, talked over the matter of shafts with the Dravo Contracting Co., of Pittsburgh, and his requirements as to car size and output were incorporated into plans and specifications, the general design being a concrete-lined section, with flat sides and arched ends.

With the grouting process for sealing water-bearing strata penetrated in the sinking, developed as it is, it is possible to sink and line a shaft with concrete under most conditions without water rings. By forcing in cement mixed with water to the consistency of a cream, either in the rock strata before sinking through them or through the lining and into the crevices, the shafts can be made practically water-tight. This feature in the new specifications for concrete-lined shafts appealed most strongly to the coal company, and was adopted by it as being certainly an advisable measure to take.

There were no interruptions to the operation of sinking or lining, nor were there any unusual circumstances delaying progress. Each shaft was sunk a distance of 40 ft. before a stretch of lining was started. Jackhamer drills were used exclusively in the sinking, always handling their work in good shape. The rock consisted for the most part of clay shales and sandy shales, with very little sandstone and limestone. There was therefore little rock in the shafts that could be used for concrete aggregate, it being necessary to haul most of the sand and gravel nearly 4 mi., 3½-ton Packard motor trucks hauling the materials.

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*Engineer, the Dravo Contracting Co., Pittsburgh, Penn.

Fireproof Construction

The shafts were designed to be as nearly fireproof as possible. The linings are of concrete, as is the partition wall separating the supply hoistway from the air compartment in the air shafts. This wall is 5 in. in thickness, reinforced with triangular mesh, and was erected in panels between the steel 8-in. H-beam buntons, laid on edge on 5-ft. centers. The stairway is of structural steel, the treads and platforms being of Diamond raised plates. The accompanying photograph of the air shaft shows a view looking down at an angle from the top toward the stairway end.

The hoist-shaft buntons are also of steel, a 34-lb. section of 8-in. H-beam being used here as in the air shaft. The guides in both shafts were of prime long leaf yellow pine, in long lengths. The splices in the guides in the shaft were different from those seen in the photographs of the shaft tops, which show a short half-together splice, whereas butt splices were used below the surface.

The arches at the hoist-shaft bottom are unique in that buntons are left out entirely, thus obviating the necessity for the concrete columns usually placed on each side of the shaft at the junction of the shaft and the arch. This column is usually placed as a support for the ends of the buntons to which the guides are attached. The change made it necessary to stiffen the guides by placing a steel channel behind one end guide and an I-beam between the two middle guides. The decided advantage of course is the absence in the shaft bottom of the bulky construction which always hinders the passage of air at this bend in the air course, and which always takes up space where roominess is so much desired.

LOOKING DOWN THE HOIST SHAFT

What water was struck in the shafts was grouted off through the lining at a very low cost, so that the shafts are absolutely dry.

The power plant at this mine of the Ford company consists of two batteries of two boilers each of Erie City horizontal return-tubular type, fired by Taylor stokers fed from hoppers filled by a belt conveyor from the coal tipple. Green fuel economizer blowers produce forced draft, the blower engine driving the stoker shafting.

SHOWING STEEL STAIRWAY IN AIR SHAFT

Ashes from the stoker grates are hauled in an electric larry through a tunnel built for this purpose underneath the front of the boilers and carried out at grade to dump about 200 ft. away. A 1,500-hp. Cochrane feed-water heater with two Dean Bros. feed pumps supplies the boilers.

Engine-Room Equipment

In the engine room two Erie ball engines drive two General Electric 200-kw. direct-current generators, the exhaust steam being piped in trenches to the heater in the boiler room, where is situated also the engine for hoisting the man and supply cage in the air shaft. This engine is a Vulcan 16x20 geared, equipped with a Nicholson overwinding device with an 84-in. drum counterweighted, the counterweight being operated in the air compartment of the air shaft on guides fastened to the center buntons. A Westinghouse 3-phase 2,200-volt alternating-current motor generator of 60-kw. capacity is also located in this room. This unit supplies light to all houses in the mining town. The main hoist engine is a 22x36 Vulcan with conical drums 8 ft. in diameter. The headframe and tipple are the work of Heyl & Patterson, of Pittsburgh. The fan at the air shaft is a Jeffrey, reversible type, of 350,000-cu.ft. capacity, with an Erie ball-engine drive.

The plant is designed to handle 3,000 tons of coal per day, and the life of the mine is figured at 35 yr. The shafts and their appurtenances, together with all foundations and mine buildings, were designed and built by the Dravo Contracting Co. under my supervision, with Samuel Vance as resident superintendent. G. G. Long was engineer for the Ford Collieries Co.

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Some Time Ago a Fatal Accident Occurred in consequence of a miner heating his explosive in an oven. This is perhaps a much more common method of "getting the explosive into condition" than is usually suspected. Among other ways of attaining the same end is the practice of carrying the explosive next to the body. The miner who is guilty of this habit may indeed be said to be a walking danger, not merely to himself, but also to his companions. The advice to the miner who does these things may be given in one word: Don't.

New York City's New Coal Specifications

SYNOPSIS—Comments on the new coal specifications from some of the leading members of the local trade are presented herewith. The penalties prescribed are regarded as excessive and the ash- and heat-unit standards as impractical. Exception is also taken to method of sampling.

The tentative specifications for the purchase of coal for the various New York city departments which were printed in *Coal Age* of July 24 are soon to be taken up for final action by the Board of Estimate and Apportionment. City Chamberlain Henry Bruere, who is chairman of the Central Purchasing Committee, has sent a letter to all dealers doing business with the city asking them to submit any criticisms or suggestions they may have concerning the city's way of doing business. Some of the dealers have already replied to this letter, and Mr. Bruere will embody these criticisms and suggestions into a report. Should the trades desire it, there is no doubt that they will be accorded a hearing, at which time they can have the opportunity of presenting their complaints.

PATTISON & BOWNS CALLS IT HARDSHIP

Pattison & Bowns is of the opinion that "the standard in force is a great hardship to anyone doing business with the city and is not for the best interests of all concerned, since it tends to lessen competition in many ways.

"The standard of ash called for in all sizes of anthracite coal is too low and can be obtained only from a few small operations. It is a well-known fact that these smaller mines which produce an unusually high grade coal send their product to the markets that pay the best price, and only send it to tidewater during times of depression. The standard of ash should be raised so as to conform with the standard of the coal produced by the majority of the large companies. This is especially so for the reason that the City of New York does not pay a premium, and it is not fair to have a standard that is so difficult that it can only be reached occasionally.

"The B.t.u.'s called for by the specifications are too high and should be lower for the same reason. The method of dividing the city into zones is unwise for the reason that a wholesaler finds it very difficult to bid on a zone which contains institutions that buy by cargo lot and also require retail deliveries. Under the old method of buying coal for each institution, wholesalers were able to bid on every institution that could receive boatload deliveries.

"By the present methods, many institutions of this character are put in a zone with others that require truckload deliveries. This is surely a hardship to the wholesalers and is not in the interest of the city."

IMPRACTICAL FEATURES

An official of one of the companies which has transacted considerable business with the city characterized the specifications as "the most undesirable that have ever been offered to the coal trade." He says further:

These new specifications provide for raising of the standards and doubling of penalties, while there is an absence of any provision for arbitration of disputes, lack of any attempt to correct the improper methods of sampling, and lastly, an arbitrary power is still invested in the city laboratories.

In view of the fact that the city does not pay premiums, it seems unfair to further raise the standards. It has proposed to make the ash standard on No. 3 buckwheat 16 per cent. and the B.t.u. standard 12,400. This is restricting the ash standard three points, from 19 per cent. down to 16 per cent., and raising the B.t.u. standard 400. The standard on sizes has also been raised.

According to the new specifications, coal must pass through a clear opening of 3/16 in. and over a clear opening of 3/32 in. The standards of the large mining companies, upon which dealers are dependent for their supplies, are for coal to pass through an opening of ⅛ in. and over an opening of 1/16 in. The large producing companies do not seek the city business; they naturally will not guarantee the specifications. Therefore, the dealer is obliged to guarantee to the city a product which he cannot buy. In the case of bituminous coal, the ash percentage has been lowered from 10 per cent. to 9 per cent., which means raising the standard 1 per cent. The B.t.u. standard has been increased from 13,800 to 14,000.

INCREASED PENALTIES

In addition to raising the standards as stated, the penalties have also been increased. Coal containing ash up to 12 per cent. is penalized as formerly at the rate of 1 per cent., but should the ash exceed 12 per cent. the penalty is double; that is, deductions are made at the rate of 2 per cent. for ash in excess of 12 per cent. The same system is proposed with respect to the British thermal units. The penalty is 1 per cent. for each 100 B.t.u. down to 13,500 and 2 per cent. below 13,500.

A contractor could very easily suffer a penalty which would amount to practically the confiscation of his coal. Take such a product as No. 3 buckwheat, which is sold to the city very often on the basis of not over 60c. per ton at the mines—the delivered price on this would be approximately $3 per ton. A penalty of 20 per cent. would not only wipe out the profit on the coal, but the entire cost of the coal itself, and a 20 per cent. penalty would not be at all unusual under these specifications. The same would be equally true of bituminous.

The "remission clause" which is to be adopted for the purpose of allowing a contractor to average up some of his losses is entirely inadequate and will not prove any inducement to an intelligent bidder. With the system of sampling and analyzing designated and with no proper provision for arbitration of disputes and absolutely no adequate check analysis provided for, a contractor would not be able to benefit by this "remission clause." This provision has been explained in a previous article (see p. 122 of the current volume).

When the contractor delivers coal which is subject to a penalty, he may be permitted to deliver a like tonnage of better coal; and if this analyzes above the specifications, he will be given credit for a premium on as much tonnage as that on which he has been penalized, excepting that he shall receive no credit against penalties on the 2 per cent. basis. In other words, if a contractor has supplied coal which is penalized on the 2 per cent. basis, his case is hopeless. In order to receive a remission on even a portion of his losses, he would be obliged to purchase a grade of coal which is practically unobtainable, and even granting that such coal could be had, the extra cost of same would be prohibitive.

In conclusion, it may be said that for a coal dealer to obtain city contracts he must sell cheaper, submit to more discourteous treatment, wait longer for his payments, allow more unwarranted deductions and supply better coal than he does to his ordinary customers. The number of bidders on city contracts has been gradually diminishing, and competition will grow steadily less until specifications are adopted that give the dealer a better chance. Raising standards and increasing penalties, which are already doubled, is the surest and easiest way to discourage competition.

POOR SAMPLING CAUSES TROUBLE

Another dealer comments further on the fact that the penalties are such that they could readily more than absorb the profit. He says:

When it is considered that the city penalizes two or three times for the same offense, it is apparent to anyone that a very slight falling off in quality entails an actual loss. There is usually only about 10c. per ton profit in coal here, and for this small profit dealers have for years been guaranteeing to meet the specifications at the same prices and even less than they are obtaining from private consumers, without any guarantee as to quality.

During the past five years a certain dealer has delivered to the city on various contracts approximately 1,000,000 tons of bituminous coal, the average price of which has been $1.04 per gross ton at the mines. Considering that during the five years there have been a great many market disturbances, this average is surprisingly low. In fact, the highest prices paid by the city during that time are far less than the average private consumer was obliged to pay.

There has been also a great deal said about the inferior quality of city coal based upon chemical analyses made by the Central Testing Laboratory. While the work of this laboratory may not be questioned, the samples are often improperly taken.

There has been no uniform system of sampling, and in many cases this has been carelessly and improperly done. There have been instances of variations of 1,000 B.t.u.'s in two deliveries of coal made to different places, both out of the same shipments. There have also been cases where coal shipped to the city has shown extremely poor results, while a shipment of exactly the same coal to others has been analyzed with favorable results. This probably has been the cause of more dissatisfaction than any one thing.

[It would be interesting to hear from others on this subject.—Editor.]

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The Trend of Conditions on New Coal Contracts

SYNOPSIS—Prices on business on the Atlantic Seaboard indicate a general firming up of that market. However, some grades are still being negotiated at minimum prices. In Ohio some big state contracts have been closed at figures substantially less than in previous years. A large Middle Western contract shows a better price than the old figure.

In the coastwise trade the few contracts that have been made the past month show the general firmness of the market, particularly on the Southern coals. While the Panama R.R. contract award (No. 1327, pp. 367, 446 and 532) was mostly at $2.60 f.o.b. Hampton Roads for Pochahontas, it is generally understood why the order was taken at so low a figure, and it is perhaps the exception that proves the rule. The proposals submitted to the Boston & Maine R.R. for locomotive supply (No. 1313, p. 367) were apparently not attractive enough to induce buying, the announcement being made (p. 576) that no further action would be taken for the present. The price paid for coal alongside the "Kronprinz Wilhelm" at Norfolk, Va. (pp. 412, 578), is a straw showing the firmness at Hampton Roads.

The active demand offshore is an important factor in the situation. The departure of the first steamer on regular service to Alexandria, Egypt, notice of which appears in this issue, and inquiries such as those from Liverpool and the Azores (p. 492), Italy (No. 1479, p. 531) and Denmark (p. 532), give some reason for predicting a strong $2.85 price at Hampton Roads, at least for the balance of the calendar year.

For distribution inland the trend is not so pronounced. Recent circulars of Boston agencies announcing a price basis for the year beginning Apr. 1, 1916, are not having a wholesome effect on the current market. Even small contracts like that at Reading, Mass. (No. 1417, p. 489), will probably be closed at as low a contract figure as has prevailed this year. At retail the Auburn, Maine, city supply (p. 532) is a sample indication of the fair prices being realized by most local dealers throughout New England.

Such coal from the Pennsylvania districts as is usually applied to contracts like the Connecticut Co.'s (No. 1420, p. 489) and the Berkshire Co.'s (No. 1427, p. 489) is still realizing minimum prices. An instance is the Massachusetts Training Schools (No. 1224, pp. 245, 578), where the order was placed at prices that net $1.28 f.o.b. mines.

The Crocker-Burbank Coal contract, Fitchburg, Mass., in the current issue, recently awarded to shippers of Georges Creek at full circular prices for delivery via water to Boston against competition of Pocahontas and New River, is further evidence of the market's strength.

Most of the large consumers in New England, their contracts having been very largely placed months ago, are beginning now to press shippers for extra deliveries in order to be protected against any possibility of car or labor shortage later.

In the Philadelphia market the most important contracts under consideration have been the 600-ton order for White Ash buckwheat coal for the Philadelphia County Prison (No. 1409, p. 578) and the deficiency contract for the Bureau of Water (No. 1516, p, 577). On the first contract there is usually very little competition, and it was again awarded to the same company which has supplied the coal for a number of years. The bids on the water bureau contract have not yet been sufficiently tabulated to pass judgment on the results.

Usually at this time of the year many of the anthracite companies begin to look after their contracts with steam-coal consumers, a large number of which expire at the first of the coming year. However, owing to impending disturbances in the mining region it is quite likely that the companies will not enter into new contracts, as this is the precedent on similar occasions. In several instances it is already reported that the operating companies are urging their consumers to stock up at the contract price and in addition are offering to allow the present contracts to run until Mar. 31, 1916.

OHIO

Generally speaking, large consumers in Ohio are able to buy their fuel for the coming year at a cheaper figure than prevailed in 1914-1915. Most of the contracts awarded at this time are for a coal supply beginning about Nov. 1 and continuing for either six months or a full calendar year.

The contract awarded by the Director of Public Safety a few weeks ago for the coal supply for the Scioto River pumping station, the garbage-reduction plant and the municipal light plant (No. 1090, pp. 117, 366, 410) illustrates the cheaper cost of coal. For the six months beginning Nov. 1 the West Virginia mine-run for the pumping station will cost $1.42 per ton, delivered on the switch, as compared with $1.54, the price paid for the same grade of coal in February, 1915, $1.58 per ton paid in the last half of 1914 and $1.72 the first half of last year. The department also paid $1.19 per ton for Hocking nut, pea and slack as compared with $1.20 for the latter part of last year and $1.39½ for coarse slack the first half of 1914. For the garbage-reduction plant the department paid $1.19 for Hocking nut, pea and slack as compared with $1.19½ per ton the first half of 1915, $1.20 the last half of 1914 and $1.39½ for the first half of 1914.

The contract to supply 10,000 tons to the Cleveland State Hospital (No. 1299, pp. 325, 578), providing for Ohio mine-run, delivered on the institution switch at $1.79 per ton, compares with $1.97½ paid last year for the same grade of coal.

MIDDLE WEST

On the water-works contract at St. Louis (pp. 117, 412), involving 34,000 tons of egg and 37,000 tons of screenings, the net price on the lump was 3c. higher than last year and on the egg ½c. lower. The freight rate is also 5½c. higher. The contract for supplying the penitentiary at Jefferson City was let at a price 63c. per ton higher than last year, but this year's contract is on a specification basis, which brings the price slightly below that of last year.

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Extracts From a Superintendent's Diary

It takes an occasional trip through a cotton mill or a steel mill to make a mining man realize that the lot of the mine laborer is not so terrible after all.

Because mining villages are generally located on branch lines, 10 miles from nowhere, and moreover because miners are denied much of God's sunlight, our city friends assume that no man would stick to mining after once learning that he could make a living at a city occupation. They have become so accustomed to crowds and the excitement of city life that the isolation of our villages and the stillness within the mines suggest the fate of a Siberian exile to them.

But when our men try their luck in the cities they often find the pace too swift and return at the first opportunity. The accounts that they give of their adventures show that it is not homesickness alone that brings them back.

One of our men who answered the call of the wanderlust by going to a city and accepting work in a cotton mill remarked when he returned that whenever he had attempted to draw a full breath he found himself wedged in between two machines. Another of our citizens who tried his hand as a laborer at a steel plant informed us, when asked about his adventures, that every time he paused to collect his thoughts a rod of hot metal would start after him and chase him out of the building before he could recall what he was supposed to be doing.

Men who have made such journeys into the outside world become, on their return, prominent forces for progress in our community. Not only have they become reconciled to the labor assigned to them by Fate, but they have learned that the new-fangled ideas about sanitation and food inspection have not been introduced into mining camps for the purpose of hampering the poor and lowly and keeping them under control, but are of vital importance.

They have witnessed the workings of similar measures in crowded tenement districts, where everyone accepted them as a matter of course; and now on their return they realize how little attention has been given to such regulations and as a result how much more fatal some diseases prove in spite of the more healthful surroundings of the average mining village.

We have several cases of typhoid in camp now, and today I chanced upon a group of our citizens in conference with our camp physician. In the group was John Taylor, recently returned from a sojourn at a cotton-mill village located on the edge of a large city.

Every suggestion that the doctor made recalled to Taylor's mind some rule and regulation that he had seen enforced, and his comments on what he had seen not only made it possible for the men to understand what the doctor was trying to explain, but gave the doctor new ideas as well.

This discussion of regulations necessary in crowded villages led to a pretty full understanding of the advantages that our citizens really enjoy in comparison with their city brothers—advantages that have always been unappreciated and taken as a matter of course; and as a direct result, our doctor was surprised to find that no suggestion that he felt called upon to make was now considered too radical by his audience.

Later in the day I met him again, and he had become very enthusiastic about the prospects of making our camp a model one from a doctor's standpoint; he is already planning to call the attention of the State Medical Society to the work that he is undertaking.

COMING MEETINGS

National Safety Council will hold its fourth annual safety council at the Bellevue-Stratford Hotel, Philadelphia, Penn., Oct. 19-21, 1915. Secretary, W. H. Cameron, Chicago, Ill.

Engineers Society of Northeastern Pennsylvania will hold a special meeting at its rooms, 415 North Washington Ave., Scranton, Penn., on Thursday, Oct. 28, 1915, at 8 p.m. The object of the meeting is to take corporate action on the proposed issue of $15,000 4-per cent. 10-year bonds, for the purpose of refunding the outstanding floating indebtedness of the society and furnishing money for its general purposes. Secretary, T. F. McKenna.

First Annual State-Wide First-Aid Meet will be held at Bicknell, Ind., Oct. 30, 1915, under the auspices of the local unions of the United Mine Workers of America and the operators of Knox County, the Bureau of Mines and the American Mine Safety Association. Secretary, William Bogle, Bicknell, Ind.

United Mine Workers of America will hold its annual convention in St. Louis, Mo., beginning Jan. 17 and continuing for three weeks. Secretary-treasurer, William Green, 1102-1109 Merchants National Bank Building, Indianapolis, Ind.

American Society of Mechanical Engineers will hold its annual meeting Dec. 7-10, New York City. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

Engineers' Society of Western Pennsylvania holds its monthly meeting third Tuesday of each month; section meeting, first Tuesday. Secretary, Elmer K. Hiles, Oliver Building, Pittsburgh, Penn.

Western Society of Engineers, Chicago, Ill., holds its regular meeting first Wednesday meeting of each month, excepting July and August. Secretary, J. H. Warder, 1785 Monadnock Block, Chicago, Ill.

The Labor Situation

SYNOPSIS—West Virginia as a state opposes the increase in freight rates on coal. The investigators of the Public Utilities Commission declare just what coal freightage in Ohio costs the railroads. The main features of the Rockefeller-King contract. Lawson is admitted to bail.

Resolutions condemning the proposed action of the railroads have been passed by the Chambers of Commerce of Charleston, Fairmont, Clarksburg, Wheeling and Huntington. The United Commercial Travelers at Charleston have passed a resolution condemning the increases. The miners' organizations at various places demand the old rates, and the state Public Service Commission, with its attorney, S. B. Avis, and its railroad representative, E. E. Winters, has visited Washington to protest to the Interstate Commerce Commission. The West Virginia papers have practically all declared the impost of higher freight rates destructive to business, and the West Virginia Coal Association, through its attorney, Z. T. Vinson, its president, T. E. Houston, and its secretary, W. H. Cunningham, is contesting the fairness of the increase.

Most of the arguments suggest that the increased freight will involve a reduction of 15c. per ton on all the coal mined in West Virginia and that the profits would be more than wiped out by such a change in freight. But of course many of the market prices will be automatically raised 15c. per ton by the increased transportation charge, and the action will be more likely to limit the further growth of the West Virginia market than to curtail its present well-extended area.

The West Virginia operators have faith that the railroads will decide not to make the proposed increase. Perhaps the intention is only to bluff off the attempt of the Ohio operators and public in seeking to reduce Ohio rates. But in any event it is felt that no change will be made. One organization has called for $50,000 from its members for a defense fund, but only $20,000 has been actually asked for, and it is likely no more will be paid in unless the fight appears more hopeless than it now seems to be to the contestants.

On Oct. 1 the Railway Commission of West Virginia filed a statement with the Interstate Commerce Commission rejecting a suggestion that it arbitrate the freight rate differentials between West Virginia, Ohio and Pennsylvania bituminous coal fields on so-called lake-cargo coal or coal which goes in solid trainloads from the mines to lake ports for transshipment. The commission declares that it cannot arbitrate and has no authority to make its findings binding upon the coal carriers.

The investigators appointed by the Public Utilities Commission to examine the books of the Hocking Valley Ry. have filed their report. The cost of moving coal is as follows:

Journey from Nelsonville to	Distance, Miles	Cost of Freight, Cents	Mills per Ton-Mile
Toledo	181	46.68	2.579
Fostoria	150	37.71	2.514
Marion	107	31.50	2.944
Delaware	85	25.83	3.039
Columbus	61	20.55	3.369
	584	162.27	2.779

To these figures for freight should be added 1.88c. when the coal is unloaded at the docks and wharves for Lake shipment.

Ohio Miners Start Coöperative Stores

The miners in Ohio are preparing to follow the example of the Illinois mine employees in establishing coöperative stores. This movement is to be praised whenever there seems a prospect of success. Just at present, however, the Ohio miners are suffering from the past dullness and the lengthy strike and are not sure of a busy winter season; so conditions are not favorable for starting stores. Moreover, the merchants having helped to tide the miners over the idle period are entitled to better treatment.

It is quite likely that the refusal of these merchants to bankrupt themselves by giving unlimited credit is the cause of their being penalized at this time by the starting of coöperative stores which will themselves be equally unable to carry their clients through a long period of idleness. Even the bitterness of the experience in coöperative store business is, however, to be welcomed for the miners. Only by having an initiation into the costs and losses of such business will they learn to maintain a charitable outlook toward these small capitalists.

Joseph Kobylak, representing the miners of Rush Run, is discussing this matter with William Roy, vice-president of subdistrict No. 5 of district No. 6, the eastern Ohio field. Stores are already being operated at Adena and Fairpoint and it is proposed that others be opened at Rush Run, Maynard, and Midway. If enough stores can be started to make the establishment of a wholesale house advisable this will be provided by the coöperation of the various local stores.

Colorado Fuel and Iron Co.'s Contract

The contract submitted by the Colorado Fuel and Iron Co. to the representatives of the miners on Oct. 2 and accepted by them subject to a general referendum provided for: 1. The representation of the men at each camp on the basis of one delegate for 150 wage earners. Each camp is to have at least two representatives. 2. The holding of district conferences, joint committees and joint meetings. 3. The prevention and adjustment of industrial disputes. 4. Social and industrial betterment.

For purposes of mediation the company's camps are to be divided into five districts—the Trinidad, the Walsenburg, the Cañon, the Western and the Sunrise, Wyo., districts. The Cañon district comprises all the mines in Fremont County. The Western district includes all the operations on the Western Slope in Colorado.

The delegates of the miners and the company at each district conference will select from their number joint committees, each composed of six members. These committees will be as follows: One on industrial coöperation and conciliation, one on safety and accidents, one on sanitation, health and housing, and one on recreation and education.

The company pledges itself to observe all federal and state mining laws and not to discriminate against any of its employees on account of membership or nonmembership in any society, fraternity or union. The right to hire and discharge, the management of the properties and the direction of the working forces are vested exclusively in the company and are not to be abridged by anything contained in the agreement.

Under the plan the company will post a list of offenses for which dismissal may be made without notice. Employees may not be dismissed for other offenses except after notification that a repetition will result in dismissal, but the company still reserves the right to relieve employees from duty for lack of work. Employees are guaranteed the right to hold meetings, to purchase supplies where they please and to employ checkweighmen.

How Miners' Grievances Are To Be Settled

Any miner or group of miners aggrieved at any working condition must take the matter to the elected representative of the camp. He is to try and reach an agreement with the foreman or superintendent. Failing that, he is at liberty to appeal to the president's industrial representative, who is at present David Griffiths, or to the higher officers of the company, finally reaching the president, J. F. Welborn.

But another method of settlement is provided. The miner or miners may have a hearing before the district joint committee on conciliation. This committee may either hear the case or appoint an umpire, whose decision shall be binding on both parties. If the committee fails to reach an agreement, it shall be settled by arbitration or by reference to the Colorado State Industrial Commission.

The company provides that the representatives of the men shall not be discharged unjustly or discriminated against in the apportionment of cars or work, and any representative who believes he has a grievance may appeal to the State Industrial Commission. The agreement is to remain in force till Jan. 1, 1918, and shall continue in force thereafter subject to revision should either party give 90 days' notice that such revision is desired.

Provisions Relating to Living Conditions

The employees are guaranteed that the charges for dwellings without bath shall not exceed $2 per room per month. The present uniform charge of 40c. per electric light per month with free light on porches shall not be increased. There shall be no charge for domestic water except where the company is obliged to purchase it. In such cases the rate chargeable shall be substantially the same as the cost to the company.

To encourage employees to cultivate flowers and vegetable gardens the company agrees to fence, free of charge, all its house lots. It will continue its practice of removing garbage free of charge. As the need becomes manifest it will continue its present policy of providing, as rapidly as possible, suitable bathhouses and social centers in the nature of clubhouses for the employees at the several mining camps.

Eight hours will constitute a day's work for all underground employees. This will mean eight hours exclusive of the noon hour and the time required to go and come from the mine opening to the place of employment. Nine hours will constitute a day's work for all outside labor, except that of firemen and engineers.

All employees will be paid semimonthly by check. No deductions will be made from earnings, except where authorized by employees. No change affecting conditions of employment with respect to wages or hours will be made without giving 30 days' notice, as is provided by statute.

The schedule of wages and the working conditions now in force in the several districts will continue without reduction; but if, prior to Jan. 1, 1918, a general increase is granted in competitive districts in which the company does not conduct operations, a proportional increase will be made. For this purpose a joint meeting of the miners' representatives and proper officers of the company will be called, within 30 days after the increase in competitive districts is effective, to discuss and determine a method for fixing the schedule in the new districts affected.

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Outlook in Coal Mining

In our last issue we printed nearly two pages of comments from prominent coal-mining people relative to the prospects for business in the coal industry this fall and winter. Additional opinions are coming in every day, the following being only a few of those received:

ALABAMA

B. F. Roden, Pres., Roden Coal Co., Marvel	Fairly good. Prices still low, and as bulk of contract business does not expire until next year, the average price for coal will be low this winter.
W. R. Young, Hills Creek Min. Co., West Blockton	Fair. Domestic business good. Steam business dull.
James Gallacher, V. P. & Gen. Mgr., Summit Coal Co., Dora	Good. This is new company just organized to develop 1,000 acres on Black Creek seam.

CANADA

John S. Barton, Minudie Coal Co., Ltd., River Herbert, N. S.	Very brisk. There is great scarcity of labor.

COLORADO

G. W. Harris, Pres., Colorado & Utah Coal Co., Denver	Good in the Routt County field.
Juanita C. & C. Co., Bowie	Poor.
J. J. Wolfersperger, M. S., Yampa Valley Coal Co., Pallas	Good.

ILLINOIS

Carl Scholz, Pres., Rock Island Coal Min. Co., Chicago	Average business this fall and winter. If strike occurs in competitive fields business will be rushing.
West End Coal Co., Springfield	Fairly good.
W. C. Alexander, Pres., The Carterville Herrin Coal Co., Herrin	About normal.
Egyptian Coal & Min. Co., Marissa	Fair.
W. R. Coleman, Clark C. & C. Co., Peoria	Above the average.
Bell & Zoller Coal Co., Chicago	Very good.
F. S. Pfahler, Gen. Supt., Southern Coal, Coke & Min. Co., Belleville	Better than last year.
Bessemer Coal & Min. Co., Tilden	Better.
Carterville & Big Muddy Coal Co., Carterville	Good. Many of the large mines which have been idle in Williamson County are now working full time.
James A. Hall, Trustee, Cantrall Co-Operative Coal Co., Springfield	Good.

INDIANA

A. M. Ogle, Pres., Vandalia Coal Co., Terre Haute	Materially improved.
John H. Jones, Klondike Coal Co., Oakland City	Good.

IOWA

A. B. Dudley, Treas., Egypt Coal Co., Mystic	Fair. Prices weak account too much eastern (Ill.-Ky.) coal being dumped on this market.
Phoenix Coal Co., Mystic	Fair. Enough business but prices low. Too much eastern coal.
S. P. Maring, Pres., Iowa Block Coal Co., Exline	Good.
T. E. Lee, Pres., Peerless Coal Co., Mystic	Normal.
K. G. Carney, Gen. Mgr., Wright Coal Co., Carney	Good.

KENTUCKY

Thomas S. Hayman, Gen. Mgr., Elk Horn Min. Corp., Fleming	Fine.
Frank L. Long, M. S., The Royal Collieries Co., Offutt	Good.
J. W. Cockill, Gen. Mgr., Henry Clay C. & C. Co., Lookout	Extra good. Labor and car shortage. All mines arranging to increase output.
R. F. Coke, G. M. Min. Div., Elk Horn Min. Corp., Fleming	Running full time.
Himyar Coal Corp., Domino	Good.
Magnet Coal Co., Four Mile	Good. Car shortage at present.
Banner Fork Coal Co., Wallins Creek	Fair.
W. L. Moss, Moss & Sons Coal Co., Pineville	Fairly good.
David Halley, The Purity Cannel Coal Co., Prestonburg	Good.
R. L. Wheeler, Brush Creek Min. & Mfg. Co., Wheeler	Good.
T. B. Mahan, Mahan-Jellico Coal Co., Packard	Good.
E. W. Holt, The Holt Coal Co., Central City	Normal. Car shortage.

MISSOURI

W. L. Schmick, Gen. Mgr., Big Muddy C. & I. Co., St. Louis	Fair on domestic coal but poor on industrial coal.

MONTANA

Walter Scott, Star Coal Co., Musselshell	Above average.

NEW MEXICO

Thomas H. O'Brien, Gen. Mgr., Stag Canon Fuel Co., Dawson	Fair.
P. A. Allaire, Emerson & Allaire, San Antonio	Good.

NORTH DAKOTA

J. W. Dering, Mgr. Min. Dept., National Briquetting Co., Kenmare	Exceptionally good.

OHIO

The Meister Coal Co., Flushing	Moderate.
W. F. Upson, Pres., Upson Coal & Min. Co., Dixie	Good.
F. W. Braggins, Lorain Coal & Dock Co., Columbus	Much better.
Thomas Brettell, Jr., Gen. Mgr., Brettell Bros., Mingo Junction	Good.

OKLAHOMA

J. G. Puterbaugh, Pres., McAlester Fuel Co., McAlester	About 70 to 75 per cent. of last year.
Wm. A. Evans, Gen. Supt., Rock Island Coal Min. Co., Hartshorne	Good.
Carbon Coal Co., Carbon	Business will depend upon weather. Cold winter, good business.
Okmulgee Coal Co., Okmulgee	Normal. Good outlook.

PENNSYLVANIA

W. W. Helman, Blain Run Coal Co., Coalport	Much better.
Hebron Robison, Gen. Mgr., West Virginia-Pittsburgh Coal Co., Pittsburgh	Continuous improvement.
W. G. Rogers, Gen. Mgr., Fair View Min. Co., Pittsburgh	Very good. August tonnage greater than June and July combined. September better than August. Good outlook.
J. P. Corcoran, Traders Coal Co., Ridgewood	Brick.
Ellsworth Coal Min. Co., Minersville	Good.

TEXAS

R. W. Carr, Carr Coal Co., San Antonio	Dull.
J. H. McLure, Gen. Mgr., Strawn Coal Co., Strawn	Good.
Geo. Derby, Gen. Mgr., Santo Tomas Coal Co., Laredo	Good.
Bridgeport Coal Co., Bridgeport	Ordinary. We have fuel oil as competitor.

UTAH

Central C. & C. Co., Salt Lake City	Good.
J. S. Smith, Sales Mgr. Spring Canyon Coal Co., Salt Lake City	Good.

VIRGINIA

C. H. Thompson, Gen. Mgr., Darby Coal Min. Co., Darbyville	Above normal.
J. S. Cheyney, Stonega Colliery Co., Glamorgan	Better this fall.
Everett Drennan, V. P. and Gen. Mgr., Stonega Coake & Coal Co., Big Stone Gap	Better than any time this year. All mines working full time. Stimulus due to big demand for coke. Steam and domestic coals quiet.

WASHINGTON

Pacific Coast Coal Co., Seattle	About same as last year.
B. H. Johnston, Pres., Mendota C. & C. Co., Centralia	Same as last year.

WEST VIRGINIA

A. J. King, Sunbeam Coal Co., Charleston	Good.
W. N. Page, Pres., Gauley Mountain Coal Co., Ansted	Coal markets and prices unsatisfactory Coke in good demand and prices improving.
Vulcan Coal Co., Vulcan	Good.
Ben Franklin Coal Co., Mountsville	Good.
Black Betsey Coal Min. Co., Black Betsey	Much better.
Carbon Coal Co., Carbon	Good demand for all grades. Labor shortage.

WYOMING

Cambria Fuel Co., Cambria	Fair.
Frank A. Manley, V. P. and Gen. Mgr., Union Pacific Coal Co., Rock Springs	Good all over the West.
The Owl Creek Coal Co., Gebo	Business very good.
Peter Kooi, Kooi	Better than usual.

Editorials

Coal--Civilization--War

That the actual civilization of today and the continuance of the present war are both dependent to a large extent on the output and use of coal is a fact not generally known or realized and may appear to be an anomaly or an exaggeration. Yet it is neither—no anomaly because it is the result of systematic study and experiment, a form of true evolution; no exaggeration when we take into consideration the vast number of processes using coal or dependent on its products.

Nor is the money value of the coal we produce, to say nothing of its byproducts, a matter of general knowledge. Take the value of raw coal at the mines as it is loaded upon cars. In 1913, for the United States alone, this amounted to $760,488,758. Its potential value is much greater, probably at least twice as much.

When we consider the vast proportion of our coal business, the ignorance of the average man regarding its conditions, activities and nature is astounding. Talk to people, ask them what coal is composed of, how it is mined, what products we obtain from it, the answers to such questions will prove the foregoing statement to be true. Even the daily papers, that could easily obtain accurate data, show a misunderstanding and lack of knowledge on the subject that are both ludicrous and lamentable.

As to the need, the absolute necessity of coal to a continuance of the war now going on, the words of that famous Britisher, David Lloyd George, in a speech made last week at a national conference of coal operators and miners, make a plain and startling summary:

"Coal means life for us and death for our foes. Steam means coal; rifles mean coal; shells are filled with coal—the very explosive inside of them is coal, and coal carries them right on to the battlefield to help our men. Coal is everything to us, and we want more of it to win the victory. Our navy owes its strength to coal. We must have more coal to win."

Even to fight at all, under modern warfare conditions, coal is absolutely necessary.

If all the coal mines in the countries at war were closed, all fuel stocks exhausted (as they very soon would be if the mines did not operate) and no coal could be obtained from neutral countries, the war on land would automatically end, unless the combatants returned to swords, knives, bayonets and clubs. Battleships, cruisers and submarines would be badly crippled, as it would be impossible to get sufficient oil to take the place of coal.

Coal is the prime mover of our civilization; and whether for peace or war, it is the substance that gives to us more useful things, more things vital to our existence, than any other substance. It is the one necessity about which we know so much and yet so little. Formed when there was no sign or footstep of man, its real value has only been discovered in the last few years. Without it our boasted civilization would be as of the Stone Age.

Many people believe that coal furnishes us only light, heat and power, whereas it is from coal that we obtain beautiful dyes, delicate flavors, the fragrance of flowers, the most powerful drugs, the material for modern explosives, antiseptics and disinfectants, roofing material, road, pavement and building materials, oils of various kinds, fertilizers, besides many other substances of great commercial value.

The following verse, published in *Punch,* covers the situation exactly:

> "There's hardly a thing that man can name
> Of use or beauty in life's small game
> But you can extract in alembic or jar
> From the 'physical basis' of black coal tar;
> Oil and ointment and wax and wine
> And the lovely colors called aniline;
> You can make anything, from a salve to a star,
> If you only know how, from black coal tar."

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Rockefeller in Colorado

The visit of John D. Rockefeller, Jr., to Colorado has had all the good effects prophesied by W. L. Mackenzie King, who, speaking of the future possibilities of a satisfactory settlement, said: "The will and conscience of John D. Rockefeller is more powerful in Colorado at present than any force which could be brought to better conditions." F. P. Walsh's criticism of that forecast now appears only weak and stupid, but men of his cast of mind are not seriously troubled even when they are shown to be ridiculous.

Mr. Rockefeller has vindicated himself and has done a considerable service to democracy by his genial proof that a rich man is in no way different from other men and is capable of enjoying the same pleasures. The wonder is that the public should have found it necessary to doubt it and growled so unpleasantly because for so long he did not take the tiresome journey and long time which were necessary to prove it.

But his trip is in a sense discouraging. Where is our democracy, if the public and some employees are to seethe with discontent and then to be brought back to friendliness by being cozened with a little easy familiarity? Are the slap on the back and a handshake really so potent that they become more effectual than liberality and character? No wonder the labor agitator, who also can dance with the miners' wives and grasp the hardened and begrimed hand of the toiler, has such power.

Surely the long attempts of the Colorado Fuel and Iron Co. to build good homes, maintain a fine hospital, provide excellent schools and secure safety for its employees should not have been overlooked by the public. Surely the work of the Rockefeller Foundation to supply a livelihood for the persons who had vituperated Rockefeller and all his officials should not have been forgotten. But still more surely these excellent qualities of Rockefeller's company and institution should not have been covered with oblivion only to have the trick of acquiring the good-will of the employees and the public turned by such trifling acts as the visit of that millionaire and a few meals eaten in common. But it is no new thing to see the public stampeded one way or the other by its personal interest in an individual. The people like to erect certain visible impersonations of times and conditions and seek some man to use as a type just as they sculpture a figure of justice and set it symbolically on a court house as a source of inspiration.

It is grossly undemocratic for the public to be so easily appeased by the mere presence of a rich man and yet to be so undemonstrative and even so hostile when that rich man and his associates have proved themselves for so many years the disinterested friends of the miner. We shall only be democrats when we judge a man by his acts and not by his manner. It is to be regretted that Rockefeller was not understood and appreciated till he used those arts which a politician learns and practices with only one-tenth part of the sincerity with which Rockefeller is animated.

But mine managers may well learn a lesson. Justice is excellent, but the quality of being human—humanity—is even better. We cannot get along without the personal element in management. Absenteeism is largely the absence of the human touch and nothing more. It may be apparent even when the management is physically present though spiritually removed. In cities where employer and employee live within a few squares of each other, absenteeism is as glaringly apparent as ever it was in the Colorado camps.

Democracy too often does not reason from analogy. It too frequently depicts individuals who are at a distance as if they were something other than human. But the coal miner must not be blamed for not understanding a millionaire whose father made his money in oil, for others than he show an equal inability to exercise a saving imagination.

Only today there came into the office of *Coal Age* a man whose business for many years has been advertising. He wanted to know who was the author of the "Notes from a Superintendent's Diary," which has been running in these columns and has met with so many favorable comments. "I am sure," said this visitor, "that scholarly fellow never superintended a mine; he has such a broad and human view." Was there ever a more laughable statement?

He was assured that the author of that diary had been a superintendent for several years and even now found in the mines his source of income. And if a man who has graduated from college, has seen something of the world and has had a wide range of reading has evolved from his consciousness such a conception—let it not be termed puerile for fear he may read this editorial—what may be, what even must be expected from men who without his advantages have been taught year after year to believe that Rockefeller is a barrel of oil with a battle-ax in one hand and a club in the other and cursed with a face lean with avariciousness?

Of course not by any means is it true that all the present employees who voted for Rockefeller's new plan were lukewarm or opposed to him through the long period of strife which marked the Colorado strike. In fact, most of the men who continued working during the strike—not, of course, those who have been reëmployed since its conclusion—must have been markedly loyal to stand by the company through the murder and arson which the strikers visited so liberally on the faithful. Still, that many of them were won over is suggested by the queer freaks in voting. Rockefeller danced and met his employees in closest union at Cameron. Here 128 voted in favor of the plan and none against. But in Rockvale, Fremont County, where Rockefeller did not go and where therefore he is still an absentee, the vote was 81 in favor of the plan and 156 in opposition to it. The whole vote stands 2,253 ayes and 483 noes.

It is interesting to note that in the mines around Ludlow the voting was most consistently for the Rockefeller-King plan. Either the men there know the facts of that trouble or else the presence of Rockefeller has done much to remove the animus created by the unfortunate event which happened in that unlucky spot.

It is apparent that larger than measures stands the man; stronger often than right doing is the "glad-hand." It would be indeed well if the anthracite operators could only learn that fact. It would help them to receive justice in their relations with the public and in their dealings with their employees, and they would not have the difficulty they now experience in securing amicable adjustments of their coal prices and wages. So far the operators have not recognized their place as industrial leaders or they would not have found their rightful supremacy menaced by those who not only term themselves, but actually are, the leaders of labor.

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The Need for Stern Measures

In one of Gilbert's farces we are gravely assured that the burglar when he isn't burgling is dangling his children on his knee. And Gilbert was probably correct in his appraisal of burglar morals. But despite the virtues of burglars and other bad bold men we cannot afford to let them go free to terrorize society nor can we because of the good that is undoubtedly in them overlook the evil which is equally undoubted.

One questions whether it is well to let bygones be bygones and let the Colorado strikers who burned, shot and terrorized men and women go scot free. If the past were past and past forever we might feel satisfied with such a solution, but what guarantee is there that the offenses, now to be forgiven and forgotten, will not be repeated by these or other men? This last labor struggle is not the only instance in the selfsame state of Colorado.

In Arizona, a state which corners with Colorado and has a governor more criminally lenient than even Governor Ammons ever was, six mine officials have been taken prisoners by the strikers and their sympathizers. A sheriff's posse rescued them and put them in Clifton court house for safety. The strikers, 2,000 in number, have raided the ice and electric plants, taking out nonunion men. Their cry is, "Down with the mine manager! Hurrah for Governor Hunt!"

The law has been treated as a weapon to be used or laid aside at the will of governors and prison authorities at the bidding of politics or maudlin sentiment. It has now lost all its strength—no, not all. It still restrains sidewalk expectoration, delayed reporting of tax returns, smoking in forbidden places and other like peccadillos. For crime it has lost much of its value, especially when those who are guilty of it have a long line of noisy and well-distributed supporters to make a lusty protest

Sociological Department

Colorado-New Mexico Meet

By Edgar Sherman*

That first-aid work has advanced in the Colorado and New Mexico coal fields was well demonstrated by the eight teams competing for first honors in the Colorado-New Mexico meet which featured Miners' Day at the Trinidad-Las Animas County Fair, Sept. 23.

The maximum score possible was 400 points for the four events, and no team in the competition was penalized as many as 50 points for careless work or failure to apply the proper treatment. Oakview No. 2, of the Oakdale Coal Co., was awarded the cup with a total score of 384, while the Walsen team of the Colorado Fuel and Iron Co. took second place with a total of only 2 points less.

BOY SCOUTS AS RAILBIRDS AT MEET, SHOWING THEIR INTEREST IN PROCEEDINGS

The teams competing and their final scores were as follows: Oakview No. 2, 384; Walsen, 382; Piedmont, 378; Morley, 373; Grey Creek, 373; Delagua, 371; Ravenwood, 370; Oakview No. 1, 354.

The events were as follows:

One-Man Event—A man has his left foot and ankle crushed by a loaded car and as a result has a severe shock. A large blood vessel on the front of the foot is wounded and bleeds freely. Dress and carry 50 ft. without stretcher.

Full-Team Event—A rock falls on a man, causing a compound fracture of the right thigh at the middle third, a simple fracture of both bones of the left forearm and a compound fracture of the left side of the lower jaw. Dress and carry 100 ft. on a stretcher.

Two-Man Event—A man is rolled by a car, and the fourth, fifth, sixth and seventh ribs on his right side are fractured. He is found with blood flowing from his mouth and suffering from a severe shock. Dress and carry 50 ft.

Full-Team Event—A man has received in a gas explosion second-degree burns on face, scalp, hands and forearms. Dress and carry 100 ft.

The judges in the contest were: Lieutenant J. R. Hall, of the United States Medical Corps of Fort Logan, Colo., Captain H. G. Garwood, Dr. J. W. Ameese, Dr. E. O. Coleman and Dr. R. M. Shea. All the four last-mentioned are of Denver.

While the first-aid meet was the primary feature of Miners' Day there were other contests arranged for the visiting miners and their families, and both the Boy Scouts and Camp Fire Girls of the various camps participated in the celebration.

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Institute Mining Schools

SYNOPSIS—The anthracite miners are attending night school in great numbers, and classes for women and girls are being held at Nanticoke, Penn.

The reports of those mining institutes in the anthracite region that are conducting mining schools at night under the direct control of the local public-school boards have just been completed by their respective presidents and secretaries and have been compiled and arranged in a comprehensive report by Charles K. Gloman, chief clerk of the Susquehanna Coal Co., Wilkes-Barre, Penn. This pamphlet is published by those companies that have taken a special interest in this work.

INSTITUTE, SCHOOL, STATE AND COMPANY COMBINE

This is the fifth report since the movement started, though the organizations were for some years in no way aided by the school district or the state. In fact this is the second season during which the schools have been directly controlled by the public-school boards and have enjoyed the immediate coöperation of the State Department of Public Instruction. At the same time the operating coal companies have not made

OAKVIEW NO. 2, WINNERS OF FIRST PRIZE

All Welshmen and proud of it. From left to right: Alec MacBurnie, captain; Eharlyn Richards, D. G. Roberts, A. H. Powell, P. Daley, A. G. Sugg. Seated: W. L. Morgan, superintendent, with cup captured from Walsen team

WALSEN TEAM, WHICH TOOK SECOND PRIZE

This team had won first prize in three previous meets and held cup two years against all comers. From left to right, standing: Robert Bausfield, Joe Wood, B. S. Marble; kneeling: Joe Polaski, Jim Cruso and Lawrence Cruso the assistance rendered by the commonwealth a reason for withdrawing their help but have continued to extend their moral and financial support. The wisdom of this threefold method of control has been amply proved by the results. With advisory committees representing both the employers and employees coöperating with the public-school authorities the three elements are united and assure the present and future success of the schools.

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*Cokedale, Colo.

The needs of the employee and those of the employer are thus combined with the knowledge and experience of the educational experts. The best proof of the success of this combination is that this year 11 of the students passed the state examinations for mine foremen and 44 those for assistant mine foremen. The total number of those studying has also increased greatly.

There were over 2,500 students enrolled in the schools of the Nanticoke Mining Institute, the Shamokin and Mt. Carmel Mining Institute and the Williams Valley Mining Institute in the season which ended this spring, and the aggregate membership of these institutes was 2,296. The following table shows the remarkable growth of the first two institutes and their schools since they were founded in 1910:

Institute Year	Nanticoke Mining Institute		Shamokin and Mt. Carmel Mining Institute	
	Members	Students	Members	Students
1910-11........	500	100	108	25
1911-12........	501	128	254	56
1912-13........	679	637	571	763
1913-14........	821	841	761	1,016
1914-15........	928	1,269	1,073	1,052

In addition to this the Williams Valley Institute, which has just completed its second year, had 295 members and 242 students.

INSTRUCTION ALSO FOR WOMEN IN THEIR WORK

Men are not the only pupils, nor is mining the only study taught. During five months of the last season Mrs. Anna Snyder Lape was employed by the Nanticoke Mining Institute as field secretary for the sewing classes for married women and employed girls. The last month of her time was devoted to a canvass of the houses in the community, and she secured no less than 559 applications from women to attend the night classes in sewing, cooking and English this fall.

These schools conducted by the mining institutes under the direction and authority of the local school boards aided by the State Department of Public Instruction have the hearty coöperation and support of the coal companies whose employees attend them. In the Nanticoke District, the Susquehanna Coal Co., the Delaware, Lackawanna & Western R.R. Co., the Lehigh & Wilkes-Barre Coal Co. and the Alden Coal Co. are their supporters. In the Shamokin and Mt. Carmel District the companies interested are the Susquehanna Coal Co. and the Philadelphia & Reading Coal and Iron Co. The majority of the students at the Williams Valley Institute schools are employees of the Susquehanna Coal Co.

LOWER COAL FIELD HAS ALSO BUSY SCHOOLROOMS

Similar night schools have been conducted in the boroughs of Plymouth and Shickshinny, but only under the auspices of the local school board. The Panther Valley Mining Institute had a paid-up membership of 770 last year, and held six monthly meetings. The work was divided into districts and these vied with one another in presenting papers. These papers and the discussions arising from them were of much assistance to the membership.

In connection with the institute, night schools were conducted by employees from the engineering department, under the direction of the superintendent of schools, who is also one of the Lehigh Coal and Navigation Co.'s superintendents. The school had a membership of 139 and an average attendance of 81. Two sessions were held weekly, and mining, primary, electrical, English and mechanical subjects were taught by 10 instructors.

This gave an average of one teacher to eight scholars, which is larger than is customary. In a number of instances students have been promoted especially where the graduates have passed their examinations and been certificated as mine foremen. The students have a slight charge to meet for books. The average expense is $2 per pupil.

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San Francisco Meet of National Safety Council

On Sept. 23 and 24, the Third Annual Joint Field Meet of the American Mine Safety Association and the United States Bureau of Mines was held in San Francisco at the International Panama-Pacific Exposition. This year the California Metal Producers' Association coöperated in promoting the meet and in making it a success. A further interesting fact in relation to the management of the contest is the fact that at the last moment the National Safety Council took the place of the American Mine Safety Association which has now been disbanded.

The first prize for mine-rescue work was awarded to the Sunnyside No. 2 team of the Utah Fuel Co., which was recently portrayed in the columns of *Coal Age*. The first-aid contest was won by a metal-mining team—that of the Homestake Mining Co., of Lead, S. D.—which scored 99 points out of a possible 100.

The first-aid contest was particularly keen, there being 9 teams representing 13 states. The Nevada Consolidated Copper Co., of Magill, Nev., was second, with a rating of 98.6 points. The team of the Bunsen Coal Co., of Westville, Ill., took third place, receiving 96 points.

The teams were awarded their prizes with appropriate ceremony in Festival Hall. H. M. Wilson, formerly secretary-treasurer of the Mine Safety Association and former engineer in charge of the Bureau of Mines at Pittsburgh, Penn., presented the Homestake team with cups and medals. The Utah Fuel Co. rescue crew was presented with its award by L. R. Palmer.

The Utah Fuel Co. rescue crew consists of M. H. Detweiler, captain; Zeph Thomas, T. J. Johnson, George Clark, J. W. Littlejohn and George Usher. The Homestake Mining Co. first-aid team is composed of C. L. Ayres, captain; James Letcher, A. E. Aladalo, M. Ellis, B. Hardwick, J. Peters, William Yaeger and F. E. Clough, manager.

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Sociological Notes

The Annual Sociological Conference of the Colorado Fuel and Iron Co. camps was held in Trinidad, Colo., on Oct. 15 and 16. Many leading educators of Colorado were in attendance. A morning session was held at Sopris, Colo., where the school and community houses were inspected.

The Fourth Annual Mine Safety Demonstration of the Ellsworth Collieries Co. was held at Ellsworth on Oct. 12. School inspection, folk dancing, lunch provided by the domestic science class, band concerts, first-aid and mine-safety demonstrations were the leading events. Mine No. 1 at Ellsworth, Penn., was winner with 1457 points, mine No. 2 receiving 1,404 and No. 3, at Cokeburg, Penn., 1,408.

The Philadelphia & Reading Coal and Iron Co. has published its official record of the Lakeside meet. It shows that Brookside received 99, Pine Knot, 98; Wadesville, 97; Suffolk, inside, 96; Draper, outside, 95; West Shenandoah, outside, 91; Alaska, 90; Mahanoy City, inside, 89; North Franklin, 87, and Bast, outside, 85.

The West Virginia-Pittsburgh Coal Co. entertained its employees in the company hall at Colliers, W. Va., recently. Music was rendered by the Locust Grove Band, and refreshments were served to all present. Prizes were awarded by G. A. Wright to those who had the best gardens. Fred Rocchio received the first prize of $25, Dominic Crossio received the second, $15, and Louise Corrodo the third, $10. The fourth prize of $10 went to Marconi and Gobbi, and $5 each was awarded to P. Bonazzi, J. Rometti and J. Tobler. W. S. Owings and G. A. Wright, retired farmers, were the judges, the former presiding over the meeting.

Night Schools for Miners have been started, in some cases by operators, in others by the Young Men's Christian Association or the local public-school boards at Nanticoke, Glen Lyon, Wanamie, Alden, Mt. Carmel, West Coal, East Coal, Brady, Sagan, Kulpont, Exchange, Shickshinny, Nesquehoning, Plymouth, Wiconisco, Lykens, Shamokin, Ellsworth, Centralia, Lost Creek, Mahanoy City, Shenandoah, Minersville, Pottsville, Hazleton, Wilkes-Barre and Scranton, all in the State of Pennsylvania. In all these the operators take an active interest. In some cases the whole cost is provided by the operators but in other instances only a part is thus furnished.

Discussion by Readers

Efficient Mine Foremen

Letter No. 7—I have read with avidity the discussion of "Efficient Mine Foremen," and would like to give a picture that some may consider more or less ideal, but is nevertheless my conception of what constitutes an efficient mine foreman.

First, as to his character: He must have the right personality; he must be a humanitarian and not a misanthrope. His love of humanity will teach him that all men are fundamentally equal and as a result he will treat them with due respect and courtesy. His integrity is above reproach, making him immune to the many petty and larger briberies that come to the mine foreman by virtue of his official capacity. He is just, treating all his workmen with strict impartiality. His standing in the community is that of a man of honor and of clean and sober habits. While he may be strong-minded and have positive views, he is not bull-headed, but open to suggestions, whether these come from the general manager or from a modest trapper boy. His wise administration will gain for him both the high appreciation of those who are his superiors in office and the absolute confidence and respect of his men.

Second, as to his capability and fitness for the office he holds: He is thorough and uptodate, theoretically and practically—a careful student and close observer of every detail. The safety-first idea is not, to him, an abstract notion with which he is expected to keep pace; instead, to him it is an important fact that vitally affects all who work in and around the mine. His constant endeavor is to teach men to be watchful as a means of avoiding possible accidents. When these occur, however, he is prepared to care for the injured and render every possible aid.

Third, as to his knowledge and experience in mining: He is thoroughly acquainted both with the mine in his charge and the system of mining employed. His knowledge of conditions throughout the mine enables him to get the best results in the ventilation of the workings and the timbering and drainage of the mine. He is a firm believer in good haulage roads as being essential to maintaining a uniformly large output of coal. He insists on the humane treatment of the mine mules. Every class of mine machinery and equipment receives his careful attention, realizing, as he does, that a regular daily tonnage depends on its constant operation. He is a strong economist, guided and controlled by a practical judgment. All reclaimed material is stored at a central point in the mine, from which it is distributed as occasion demands. This supply is exhausted before he will permit new material to be ordered or sent into the mine. He studies carefully trade-union agreements, knowing that a superficial knowledge or an inaccurate interpretation of their meaning is the cause of a majority of organized-labor troubles. The knowledge so required enables him to deal justly with his men and expect from them a fair return.

Fourth, as to the results of his management: The number of accidents occurring in the mine is reduced to a minimum, because the men coöperate with such a foreman in his safety-first campaign. They come to realize that their physical well-being is of more value to them than any award under compensation laws or relief plans. The quality of the coal mined is improved, because he has made the men to understand that the marketing of the coal and the continuous operation of the mine depend on their sending good, clean coal to the surface and that in doing this they avoid the danger of being fined, docked or discharged. The result is a maximum output of coal at a minimum cost of production. The efficiency of the foreman and the coöperation of the men produce these much-to-be-desired results. There is thus established a feeling of mutual confidence between the foreman and his men, and as an outgrowth of this condition in the mine, there is formed a closer affiliation through the agency of social clubs, educational classes, entertainments and sports, all of which enable foreman and men to meet on a fraternal basis as citizens and coworkers in a prosperous and contented community.

With this picture before us, I would ask, Does efficiency pay?

WM. JARDINE,
Section Boss, Bunsen Coal Co.

Universal, Ind.

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Explosibility of Coal Dust

Letter No. 2—The following remarks that appeared in the editorial in *Coal Age*, Aug. 21, p. 303, entitled "Explosibility of Coal Dust," appeal to me as worthy of careful analysis on the part of all investigators of the dust-explosion problem:

> Until more is known and until the value of the tests of inflammation as a true index of explosibility is proved, it is best perhaps to sit on the fence and declare that we do not know why one dust explodes with ease and violence and another dust with difficulty and without energy.

It is obvious to all that the uncertainty to which this remark refers must be removed if possible, because the complete understanding of why one dust explodes with ease and violence while another is difficult of explosion and develops little or no energy is a fundamental necessity in the solution of the explosion problem and the adoption of means for protection against such an occurrence.

In our investigations, thus far, we have learned that the magnitude of explosive power of a combustible gas depends upon the amount of air with which it is mixed. Different gases require different proportions of air to develop the maximum explosive energy. We have learned that, likewise, the complete combustion of different kinds of coal involves a different weight of air for the same weight of coal consumed, and even when burning different grades of the same coal it is necessary to regulate the air supply to suit the requirements of each grade in order to get the best results.

It is logical, therefore, to conclude that every variety of combustible dust requires its own specific admixture of air in order to develop its maximum explosive force. This fact alone explains why one dust is easily exploded and develops great violence, while another explodes with difficulty and little energy. It is important to distinguish, in this connection, between the inflammation and the explosion of gases, in order to appreciate fully the influence of air supply. While the inflammation of a gas may take place under a variety of conditions or mixtures, perfect combustion resulting in a maximum of explosive energy only obtains with an exact proportionment of air and gas. The editorial states further as follows:

> All we do know is that it is almost impossible to explode under working conditions a mineralized carbon dust like anthracite.

This knowledge is comforting, but undoubtedly there would be a feeling of greater security if the true reason were known why the explosive combustion of anthracite dust is impossible under the conditions prevailing in the mines. While the test made on anthracite dust in the experimental mine at Bruceton developed no explosion, similar experiments made in England on anthracite dust from the mines in Wales produced explosive combustion of the dust. The suggestion that the anthracite dust of Wales contained a slightly greater volatile content than the dust of Pennsylvania anthracite is merely a guess in the attempt to explain the difference in the results of these experiments.

The English experiments were not made under the same conditions as those in the United States, which renders it impossible to form an accurate conclusion without knowing the influence of these differing conditions. It would have been interesting if the two governments had exchanged dust and had performed experiments, each under their own conditions, on the other's dust. This exchange would have served to render the experiments comparable. Had the Welsh dust then exploded in the Bruceton mine, and the dust from this country failed to explode under the English conditions of experiment, we might rightly conclude that the difference was owing to the greater volatile content of the dust.

On the other hand, if our experimenters should fail to produce explosion of the Welsh dust, while the dust from this country exploded in the English mine, it would be conclusive proof that the difference in the results of the experiments was not due to the constitution of the dust of the coal, but to the difference in the conditions under which the experiments were performed. Further tests would then be necessary in order to reveal the true reason for explosive combustion.

I feel that little has been done at any of the experimental stations to establish the exact influence of the air factor in dust explosions in mines. On June 11, 1914, a test was made in the Bruceton mine, on the occasion of the visit of the Mine Inspectors' Institute, U. S. A., to that mine. A description of this experiment will be found in *Coal Age,* Vol. 6, p. 65. This description was prepared by Chief Engineer Rice and Assistant Engineer Jones, of the Bureau of Mines, who state that the air current traveling in the mine just prior to and at the moment of explosion had a velocity of 850 ft. per min. In this experiment one entry was made the intake and the other the return, and the igniting shot was placed in an offset at the center of the last crosscut between the two entries, so as to produce an equal effect on both entries. To further duplicate the conditions on the intake and return, each entry was loaded with the same weight of coal dust, similarly placed. Thus the conditions were identical in each of these entries, except for the direction of the air current, which was intake on one and return on the other entry.

In order to correctly interpret the results of this experiment, it will be necessary to consider the relative effect of the igniting shot and the initial blast on the intake and return currents respectively. For example, the air in the crosscut, on the intake side of the shot, was traveling with a velocity of approximately 14 ft. per sec. toward the shot, while that on the return side was traveling with the same velocity away from the shot. As a result, the initial blast causing the ignition of the dust in the vicinity produced an easy acceleration of the current on the return side of the shot, while on the intake side it set up a conflict of forces. In the return the air and dust were forced steadily ahead and away from the flame, while on the intake side the conflict of forces resulted in the thorough mixture of the air and dust, in close contact with the flame. Thus, on the return side, the conditions were unfavorable to the quick development of explosive combustion, but on the intake side they were favorable to the same.

The results of the test showed that the average velocity of flame between stations on the return was 182 ft. per sec., while that on the intake was only 131 ft. per sec. At a station on the return air course 150 ft. distant from the shot, a pressure of 1.4 lb. was registered by a recording gage, while at a station located at the same distance from the shot on the intake side a pressure of 2.4 lb. was registered. On the return air course, 550 ft. from the shot, the pressure had fallen to 1 lb., while at the same distance from the shot on the intake it had risen to 5 lb.

The conclusions drawn by the bureau engineers from the observed facts are stated, in the article to which I have referred, as follows:

> It would not appear from the pressure and velocity records that the high velocity of the air current had much influence on the development of the explosion. About the only variation in the action of the explosion in the two entries was that the velocity of flame on the return side was somewhat greater than that on the intake side. While this may have been an effect of the ventilating conditions, it was probably more a matter of chance than an effect of the air current, since the explosion was so slow.

No explanation is given for the conclusion that the slower advance of the explosion on the intake side should make the slower flame velocity on that side "a matter of chance," or why the fact that flame travels faster with the draft or in the direction of least resistance should have no application in this case.

It is freely admitted that conclusive proof in regard to the effect of an air current of high velocity on the development of a dust explosion cannot be established by a single test. Assuming that these results were not "a matter of chance" and without other evidence than that of this test, all that can be said regarding the possible effect of the high velocity of the air is that the initially low and decreasing pressure on the return indicates that the air moving away from the shot at a velocity of 14 ft. per sec. apparently prevented the early development of explosive combustion on the return, while the initially higher and increasing pressure observed on the intake indicates that the air moving toward the shot at a velocity of 14 ft. per sec. apparently promoted the earlier development of explosive combustion on the intake.

The bureau engineers state that "the pressure, as recorded by the different manometers, showed that the explosion was light, partly due to the dust being mixed, and perhaps also due to the wet condition of the mine." Another deterrent feature in this respect might have been mentioned as follows: The prevailing air conditions, notwithstanding the fairly high velocity of the air current, were probably not favorable to the development of violent explosive effects in the mine. My reasons for this conclusion have been stated in previous letters to *Coal Age*, Vol. 6, pp. 518 and 761, and need not be repeated here, since they could not be applied in the interpretation of the results of this test as the engineers have not given the barometric pressure and the temperatures in the mine and outside at the time of making the test.

Further, experience has proved that at the season of the year when this test was made (June) mines are practically immune from dust explosions. I know it will be claimed that the presence of an increased amount of moisture in the mine in the summer season accounts for this immunity, and no doubt it does in part. However, proof has been steadily accumulating that the presence of moisture is not the sole and probably not even the principal cause of the absence of these explosions during warm weather, but that air conditions more likely determine the results.

Considerable progress in the solution of the problem would be possible if another experiment were to be made in the Bruceton mine next winter, at a time when the outside temperature is below the freezing point. This test should be made under identically the same conditions as the test in June to which I have referred. I think it is a safe prediction that such a test would not only bring out the dominant influence of the air factor, but would also show that the editor's conclusion, *Coal Age*, Aug. 21, p. 303, that "though moisture is probably a protection it is not an unquestionable guarantee of safety," is based on the truth.

JOHN VERNER,
Former State Mine Inspector.

Chariton, Iowa.

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Compensation in Relation to Constitutional Rights

Letter No. 2—I was much interested in the article of Sim. C. Reynolds, *Coal Age*, Sept. 25, p. 515, on the relation of the Workmen's Compensation Act to their constitutional rights. Mr. Reynolds' letter seems to draw an analogy between the curtailment of a constitutional right and an unconstitutional wrong. It is immaterial that the constitutionality of the one is political and the unconstitutionality of the other physical and moral. The former is governed by the exercise of an arbitrary power, while the latter can be controlled only by the force of moral suasion.

Speaking of the "quiet acceptance" of the compensation act by mining men, Mr. Reynolds states that it "indicates a satisfaction in the accomplishment at last of a duty long deferred by the state." He assigns no reason, however, why this duty has been so long deferred and then passed by the Assembly at its recent session. In my previous letter I endeavored to ascribe a reason for the nonpassage of this act, and though my explanation may appear to reflect a prejudiced opinion, I am convinced that it is worthy of consideration. I believe that the true reason why such an act has not been passed before is that it has not suited the ideas of employers of labor. No measure that is intended to materially benefit the laboring man will meet with the approval and sanction of his employer unless such benefit can be conferred without jeopardizing or inconveniencing the interests of the latter.

My letter was designed to call particular attention to sec. 302 of the compensation act, in which it is made optional with the employer and employee to accept or reject the provisions of the act. I feel sure that the general opinion would be that an employer would be more willing to avail himself of this proviso than an employee. This conclusion is warranted by the proviso in the act, which states: "It shall not be lawful for any officer or agent of this Commonwealth . . . to give such notice of rejection of the provisions of this article to any employee of the state," etc. The act is thus made compulsory for the state, but not for the individual or corporate body. There may be good and sufficient reason for this provision of the act which it is unnecessary to consider in this connection.

When an employee does not accept the provisions of art. 3 of the compensation act, it is true he is not deprived of his constitutional right to secure redress for injury through a process of common law; but this, as Mr. Reynolds has very empathically pointed out, is uncertain at the best. Thus, it is clear that the administration of the act becomes a potent force in opposition to a process of common law seeking redress for injury to an employee.

Mr. Reynolds presents a very plausible argument on the relative value to an employee of the free exercise of his constitutional right and the material compensation under the operation of the act. He has evidently assumed that my reference to the waiver of his constitutional rights, on the part of an employee, was of greater intrinsic value to him than the material benefit to be derived through the compensation provided under the act. I heartily agree with Mr. Reynolds that such is not the case and wish to say that it was not intended to be implied in my previous letter. I cannot, however, so heartily concur with him in his eulogy of compensation laws in general and the operation of such a law in Pennsylvania in particular, especially when its enforcement is based on such radical changes as have been required in the mining law, in order to bring mine employees under the operation of the act.

I do not want to be classed as one resting in complacent satisfaction that the actual test of this law will prove its adequacy. I believe it is fraught with conditions inimical to the desired good. One feature of the situation that supports this conclusion is that in order to make the compensation act acceptable to the coal operators it was necessary for the state to surrender all rights of supervision and control in the operation of the mines. This concession places the operation of coal mining outside of state supervision and makes it a law unto itself, which will be inevitably the expression of a single party only to the matters in controversy. I want to ask, Is not this pure class legislation?

For the purpose of argument let us assume that every coal-mining operation in the state elects to come under the provisions of this act. Having paid to the State Workmen's Insurance Fund the necessary premiums to insure themselves against liability for accident to their employees, the companies are free to operate their mines without respect to the provisions of any previously existing mine laws. As a result the safeguards thrown around the coal miner are destroyed by the practical annihilation of many of the provisions of the mine law. Evidence of this fact is to be found in the amendments Nos. 329 and 330 by reason of which the statutes thus amended become practically inoperative.

The reading of these amendments drives one to the conclusion that the preservation of life and prevention of injury to employees in the discharge of their duties in the mine are made matters of secondary consideration. By the payment of a stipulated premium, the operator is made secure against loss for accident or injury to employees while at work. I would ask, Why should an operator incur additional expense to protect his employees from injury when he has already paid for any damages that may arise therefrom? It is useless to urge the plea of humanity, in reply. I believe it is Blackstone who remarked, "Corporations have no souls," and it is impossible to convict or convince them on the principles of humanity.

In closing, I want to repeat a statement made in a prominent daily publication of this state to the effect: "The father of a large family applied for work at his usual vocation and was refused on the ground that he was a poor risk under the proposed compensation act." Is it not true that employers will select only the best possible risks consistent with the work to be performed? Many a laborer who is well-adapted by a lifetime of service in the mines will thus be deprived of his God-given right to earn the reward for his labor. As a miner I daily face the dangers of a miner's life. I am not an opponent of compensation, but would strongly advocate a law that would distribute the burden of each individual on the shoulders of all who profit or benefit by his toil. Wage earners are an absolute necessity to the welfare of the entire community, and compensation for injury or death in the performance of their duties is rightly the burden of the community whom they serve and of which they are a part.

A. M. Iner.

——, Penn.

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Study Course in Coal Mining

By J. T. Beard

The Coal Age Pocket Book

Use of Logarithms—By the use of logarithms the processes of multiplication, division, involution and evolution are greatly shortened and simplified. The two latter processes are in fact a repetition of the two former; while division and evolution are the reverse operations of multiplication and involution, respectively.

It is important to observe that the use of logarithms enables the finding of decimal powers and decimal roots of numbers, which is impossible by other means. When a decimal index of a power or root of a number can be expressed as a fraction the numerator and denominator of such fraction express respectively the indices of the power and root or the root and power, as the case may be. The decimal index, therefore, expresses in one operation the extraction of any given root of any given power of a number, which will be better understood later.

The application of this principle is shown in numerous instances where quantities vary in their relation to each other according to different powers. For example, in fan ventilation, the fourth power of the speed (n^4) of the fan varies as the fifth power of the quantity (q^5) of air in circulation; which is expressed as follows:

n^4 *varies as* q^5

or n *varies as* $q^{\frac{5}{4}}$; or $q^{1.25}$

and q *varies as* $n^{\frac{4}{5}}$; or $n^{0.8}$.

The expression $n^{\frac{4}{5}}$ or the four-fifths power of n is identical with $\sqrt[5]{n^4}$ or the fifth root of the fourth power of n. Hence, to extract the root of a power, divide the exponent of the power by the index of the desired root and the quotient will be the new exponent, which combines the two operations in a single transaction.

Rules for the Use of Logarithms—The following four simple rules cover all the operations of logarithms:

1. Multiplication: To find the product of two or more numbers, add their logarithms; the number corresponding to this logarithmic sum is the desired product.

In other words, the logarithm of the product of two or more numbers is equal to the sum of the logarithms of the numbers.

2. Division: To divide one number by another, subtract the logarithm of the divisor from that of the dividend; the number corresponding to this logarithmic remainder is the required quotient.

In other words, the logarithm of the quotient is equal to the logarithm of the dividend minus that of the divisor.

3. Involution: To find any given power of a number, multiply the logarithm of the number by the exponent of the power; the number corresponding to the resulting logarithm is the required power of the given number.

4. Evolution: To find any given root of a number, divide the logarithm of the number by the index of the root; the number corresponding to the resulting logarithm is the required root of the given number.

The Coal Age Pocket Book

Arithmetical Complement—The arithmetical complement of a logarithm is the remainder found by subtracting the log from 10; the logarithm of 3 is 0.47712, and its arithmetical complement is, therefore, 10 — 0.47712 = 9.52288. Its use involves subtracting from the final result as many tens as have thus entered the solution. The antilog is more convenient for use.

The Antilog—The solution of problems frequently involves the multiplication and division of many quantities. In the use of logarithms, the sum of the logs of the divisors would be subtracted from the sum of the logs of the multipliers, to obtain the log of the final result. By the use of what is called the "antilog" of each divisor, it is possible to complete such a solution in a single operation, by adding together the logs of the multipliers and the antilogs of the divisors.

The **antilog** of a number is obtained as follows: Subtract the mantissa of its log from 1, for the mantissa of the antilog. Then, add 1 to the characteristic of the log and change its sign, the addition being always algebraic. The following examples will make the process understood:

1. To find the antilog of 800: Log 800 = 2.90309
Mantissa of antilog, 1 — 0.90309 = 0.09691
Characteristic of antilog, 2 + 1 = 3; and changing sign = — 3
Hence.......... Antilog 800 = $\bar{3}.09691$

2. To find the antilog of 2: Log 2 = 0.30103
Mantissa of antilog, 1 — 0.30103 = 0.69897
Characteristic of antilog, 0 + 1 = 1; giving — 1
Hence.......... Antilog 2 = $\bar{1}.69897$

3. To find the antilog of 0.4: Log **0.4** = $\bar{1}.60206$
Mantissa of antilog, 1 — 0.60206 = 0.39794
Characteristic of antilog, — 1 + 1 = 0 (zero has no sign)
Hence.......... Antilog 0.4 = 0.39794

4. To find the antilog of 0.00125: Log **0.00125** = $\bar{3}.09691$
Mantissa of antilog, 1 — 0.09691 = 0.90309
Characteristic of antilog, — 3 + 1 = —2; giving + 2
Hence.......... Antilog 0.00125 = 2.90309

Note—The use of the antilog accomplishes the same purpose as the arithmetical complement and requires no correction of the final result as explained in reference to the latter. It should be observed that the antilog of a number is always the log of the reciprocal of that number. Thus,

Log 800 = *antilog* 1/800 or 0.00125

As shown above, log 800 = 2.90309; antilog 0.00125 = 2.90309.

Example—Solve the following by the use of logarithms:

$$p = \frac{ksq^2}{a^3} = \frac{0.00000002 \times 40{,}000 \times 50{,}000^2}{50^3} = ?$$

Solution—
log 0.00000002.......... $\bar{8}.30103$
log 40,000.......... 4.60206
log $50{,}000^2$ (4.69897×2).......... 9.39794
antilog 50^3 (log $50^3 = 1.69897 \times 3 = 5.09691$).. $\bar{6}.90309$
Log p 1.20412

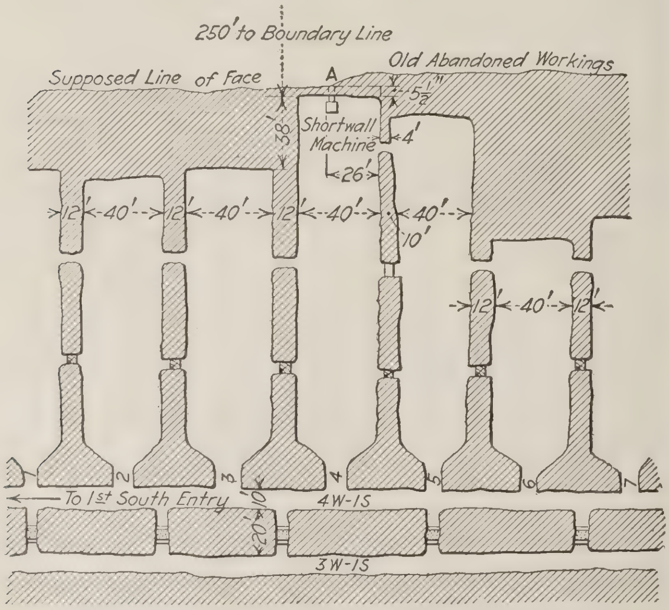
Hence p = 16 lb. per sq.ft.

Inquiries of General Interest

A Flooded-Mine Proposition

I would like to present for such advice as may be obtained through *Coal Age* and its readers an interesting and difficult proposition, which we have been up against recently in the operation of our mines. It is as follows:

Some time ago one of our shortwall mining machines cut through the breast of a room into an old abandoned mine, which was entirely filled with water. The machine was working at the time in No. 4 room of the fourth west off the first south entry. As shown in the accompanying sketch, the cut was started at the right rib in the face of the room and had proceeded 26 ft. across the breast when the water suddenly broke through into the room. As the coal dips toward the face, it was not 15 min. from the time the machine cut through until the water flowing in from the old workings had entirely filled the room to within 18 in. of the roof, and flowing through the last breakthrough between rooms 3 and 4, the water reached the lower portion of the south entries, which are not shown in this sketch.



PLAN OF ROOMS, SHOWING WHERE MACHINE CUT THROUGH INTO ABANDONED MINE

So rapid had been the inflow of water that the machine men were unable to withdraw the machine from the undercut, where it still remains, and everybody left the mine. In company with the mine boss, however, I immediately went into the mine and ascertained that there was a very large stream of water flowing through the break and that it would soon flood the entire mine. We at once set to work and built a concrete bulkhead across the two south entries, and by this means we were able to hold back the water and prevent its reaching other portions of the mine. At the same time we ordered pumps sent by express, and these were installed and put in operation in time to prevent further inundation.

The equipment installed consisted of two two-stage 5-in. centrifugal pumps and two 5-in. plunger pumps. These four pumps proved to be able to handle the water, and later it was found that they were gaining on the inflow. The water was gradually reduced in volume so that it was possible to continue operating the mine every day. Investigation showed that the inflow was largely reduced by reason of the heaving of the bottom, which partly closed the opening made by the machine. Owing, however, to the water having cut out some of the bottom coal, the flow still ranged from 700 to 800 gal. per min.

I would like to ask *Coal Age* and its readers what is the best method to pursue in this case, in the erection of a permanent stopping across the face of the room that will be sufficiently strong to withstand the pressure of the water so that there will be no fear of further trouble in the future. Will it be possible or practicable to wall off the coal face in No. 4 room and those adjoining it, in such a manner as to make the place secure? What should be the thickness of such a concrete wall, and how should it be constructed? I would greatly appreciate any practical suggestions that will assist us.

WILLIAM W. MILLER, General Manager,
Pittsburgh Mining Co.
Pomeroy, Ohio.

The proposition presented by correspondent is one that will interest a large number of *Coal Age* readers, who are invited to give their suggestions and to state what in their opinion is the best method to pursue. Unfortunately, correspondent has omitted to give several important data that are absolutely required before an intelligent answer can be given to his question.

It may be assumed, however, that the water is flowing into the mine under a head of, say, 100 ft., the present rate being 700 or 800 gal. per min. The mine is a drift opening in a generally flat formation, the coal being the No. 8 seam in Ohio, which is 4½ ft. thick in this mine.

In answer to the request of correspondent, let there be many suggestions by readers in regard to the most practicable means to be adopted in this case, in order to insure the future safe operation of the mine. To start the discussion, *Coal Age* would suggest the feasibility of sinking drillholes at the faces of rooms 3, 4 and 5 of a size—say 4 or 6 in. in diameter—to enable good cement grouting to be run into the mine.

This suggestion assumes that the pumps installed are capable of draining these rooms and controlling the inflow of water sufficiently to enable the erection of a strong timber bulkhead, say 3 or 4 yd. back from the face of the coal, so as to confine the grouting run in through the drillholes, in the space between the bulkhead and the face of the coal. In order to form a water-tight joint at the floor and roof of the seam, shallow trenches or troughs should be dug in the floor and the roof the entire length of and within the bulkhead, the purpose being to prevent an even joint.

Examination Questions

Alabama Fireboss Examination, Held July 26-29, 1915

Selected Questions

Ques.—What dangers may arise from improperly putting together a safety lamp?

Ans.—When a safety lamp is not properly assembled, either from some of the parts being omitted or not fitted accurately together in their right place and made secure, there is danger that the flame of the lamp or the flame of the gas burning within the lamp may pass through the small apertures furnished by the improperly fitting parts and ignite the gas outside of the lamp. In order to provide the desired security, all openings to the lamp must be protected by standard wire gauze, which under normal working conditions prevents the passage of flame from within to the outside atmosphere. When a lamp is improperly put together, there is danger of the parts working loose, and the improper assembling of the parts may also invite an incautious miner to tamper with the lamp in an attempt to improve its condition.

Ques.—Is it possible to have an explosion in a mine when the lamp gives no indication of the presence of firedamp?

Ans.—Yes. A blownout or a windy shot may result in a dust explosion under conditions that make this possible where the coal is soft and inflammable and fine dust and slack have been permitted to accumulate at the working face. It has been amply proved that the fine dust of an inflammable coal is capable of explosion, in the entire absence of combustible gas. Instances are on record where ignition of gas and dust has taken place and explosion followed as a result of a heavy fall of roof, in a particular rock formation capable of striking sparks. Such was the case in the Bellevue mine explosion, Dec. 9, 1910, at Alberta, Canada, as described in *Coal Age,* Vol. 3, p. 985.

In the mining of a highly inflammable coal a combined explosion of dust and gas is possible when the percentage of gas present in the air is much below what is indicated by the ordinary Davy lamp or what is commonly observed in the examination of a mine for gas by the fireboss.

Ques.—What dangers may arise from the improper care and handling of safety lamps by workmen?

Ans.—Owing to improper care on the part of the workman, a safety lamp may become clogged with dust and oil so as to be dangerous for use. Or the lamp may be placed in such a position as to become injured by falling slate or coal, or by an accidental blow of a pick or other tool, or it may fall from its position and be overturned. In any such case there is danger of the lamp passing flame, either by being injured or by reason of its fall, or by the flame impinging against the gauze of the lamp and heating it to redness should the lamp be overturned by accident.

There is also danger of a safety lamp passing flame when it is improperly handled. For example, the lamp may be swung to and fro when being carried, or it may be exposed to a strong air current or carried too rapidly against the air current passing in an entry, or it may be exposed for too long a time to gas, or the gauze may become heated by the lamp being held in an inclined position or by reason of too large a flame in the lamp. In any of these cases the lamp is unsafe.

Ques.—What are the dangers arising from the use of powder in dry and dusty mines?

Ans.—The use of powder in dry and dusty mines is always attended with more or less danger from the possible occurrence of a windy or blownout shot, as the result of overcharging the hole, or insufficient tamping, or the improper placing of the hole, the charge being laid too deeply on the solid, or the coal not being properly mined or sidecut, or the presence of fissures or crevices in the coal, or the shot blowing through into adjoining rooms or workings. There is also danger from the use of too quick a powder for the coal being mined, or the firing of two or more shots at the same time in the same working place, or mixing different grades of powder in blasting. It is important to permit no accumulations of fine dust and slack at the face when blasting, and only permissible powders should be used in such mines.

Ques.—In an airway 8 ft. wide and 6 ft. high, the air has a velocity of 420 ft. per min.; what is the volume of air passing per minute?

Ans.—The area of this airway is $8 \times 6 = 48$ sq.ft. Then, assuming that the velocity given is an average velocity for the entire area of the airway, the volume of air in circulation is $420 \times 48 = 20{,}160$ cu.ft. per min.

Ques.—If certain working places in a mine generated gas frequently and other working places gave off little gas, which would you examine first in making your rounds in the morning, and for what reason?

Ans.—This question cannot be intelligently answered without further information. If the mine is properly ventilated, it may be assumed that the section of the mine generating gas frequently, has its own separate air split and that the return from this section is not permitted to pass through the other portions of the mine, but enters at once into the main-return airway. In such a case it would be natural for the fireboss to proceed first to examine the gaseous section, for the reason that if gas has accumulated in that section, steps should at once be taken for its removal, and there would be less danger of an accident during the examination of the other portions of the mine.

Assuming, again, that the places frequently generating gas are distributed in different portions of the mine, it would not be possible to examine these places, except in their regular order. The fireboss making the morning examination of the mine, having examined the ventilating apparatus to see that it is working properly, proceeds at once to the bottom of the intake or downcast shaft and follows the intake air in its course throughout the mine, examining each place in regular turn.

Book Reviews

An Encyclopedia of Mining

LIBRARY OF COAL MINING AND ENGINEERING. 8 vol., comprising 3026 pp., including introductions and indexes. 5½x8½ in. Well illustrated. McGraw-Hill Book Co., Inc., 239 West 39th St., New York City. Price $16, cloth boards.

This handy grouping of interesting information bearing on coal-mining plant operation will be of interest to every mining man. In most cases the volumes thus assembled have not been specially written for his reading. Nevertheless, they appear to fit in admirably with the needs of the engineer and manager, though in places they contain some material not altogether germane to coal mining and they omit entirely some subjects which from time immemorial have been considered as having a paramount interest to mine officials.

From the earliest days we have taken geology as the fundamental study of mining and harrowed our minds with all the freakish developments of a planet out of gear. But it is refreshing to see a book which realizes that the mine is a machine shop and not a classroom for field geology. The books mark an era—the passing of the mining man who regarded himself as a brother to the civil engineer and his replacement by one who looks at coal mining largely as a mechanical problem.

CHIEF STUDY IN MINING IS MACHINE OPERATION

In fact it is time for mine managers to put aside the misconceptions fostered by early association and training and to treat the mining problem as a study of mining and not of coal hunting, surveying and mine gases, though these subjects have their value. But there is nothing so likely to keep us back in development as to have too large a stress laid in our training on the less essential elements.

In many mines, blest with a reasonably level bed and coal of even thickness, the problems of haulage and of cutting are of paramount concern and the emphasis given them in this library is well justified. However, it must be conceded that these books should be supplemented by some chapters on mine gases, ventilating methods, mine projection, safety lamps, oil and electric, and a more extended reference to rope haulage than is included in these volumes. Mine cars, hoisting devices, cages, self-dumping devices also are allowed to pass without recognition. But to make up for these deficiencies the books are in some places remarkably strong.

Hubert E. Collins' "Erecting Work" is particularly desirable for a mining engineer. He has often found himself at his wits' end to meet difficulties in erecting, and usually, be it said, some working man, with just plain brains and no training in the university, has had to take the work off his hands and complete it. The engineer will be interested in chapters on "Knots and Hitches," "Runways on an Incline," "Work for a Gin Pole," "Rigging for the Receiver," "Moving a Cylinder," "Unloading a Heavy Shaft," "Rigging for a Heavy Lift," and "Some of the Lighter Work in Erecting."

The "Electrical Catechism," by George D. Shepardson, professor of electrical engineering in the University of Minnesota, covers in 400 pages the whole subject of electricity in its more elementary phases and in a most practical manner. Most electrical books carefully and skillfully disguise the facts; this volume makes them plain.

NO QUAINT IRRELEVANCES ABOUT THE PAST

It is Hubert E. Collins who supplies "Boilers, Pipes, Piping and Pumps," and as usual he tells the reader just what he wants to know. He does not say anything about Hero, Savary or Newcomen, but he harps on troubles and how to meet them. When the superintendent goes down to the works the fireman does not ask him what was the shape and capacity of the boilers of Lord Worcester, but he tells him the boiler is priming or won't make steam and wants to know why. It is the professor of steam engineering who never had boilers to run who fills up his treatise with irrelevant matters about Watts early studies on the operation of a kettle.

E. E. Sommermeier's "Coal" has been reviewed in these columns already. It is a preëminently practical book, written by a man who has had long experience in analyses. The operations of the analyst are conducted in the laboratory and not in the field. The professors are able to discuss them therefore as practically as field workers and keep their treatises free of the side issues with which books about field matters are too often cumbered. H. J. Thorkelson's "Air Compression and Transmission" is also an old acquaintance. It needs no further words of commendation.

Hubert E. Collins treats of "Steam Turbines" in his usual practical way. A. T. Shurick's "Coal Mining Surveying" is an old acquaintance of the readers of "Coal Age." R. S. Brinsmade's "Mining Methods" is a reprint of "Mining Without Timber," with the matter not germane to coal mining omitted. "Practical Shaft Sinking" is handled by a man of experience—Francis Donaldson, chief engineer of the T. A. Gillespie Co.

The "Power Catechism" is provided by F. R. Low, the competent editor of "Power." The information he provides is in clear language which cannot fail to make the meaning of the author readily comprehended. "Practical Mathematics," by Claude Irwin Palmer, associate professor of mathematics at the Armour Institute of Technology, treats simply of arithmetic, elementary mathematics, graphics, elementary trigonometry, logarithms and mensuration.

"Mining Equipment" and "Mine Organization and Safety" have been specially written for this series by Frank H. Kneeland, an associate editor of "Coal Age." They are both strictly uptodate, but are both somewhat too brief for the importance of the subjects treated. W. M. Weigel's treatise on "Ventilating Equipment," already published in "Coal Age," covers the subject of fans thoroughly, though it largely omits reference to the mathematical theory and practice of mine ventilation.

Electric Signals for Mines

ELECTRIC MINE SIGNALING INSTALLATIONS. By G. W. Lummis Paterson. Pp. viii + 191 + 4 index; 4⅞x7½ in. 139 fig. D. Van Nostrand Co., 25 Park Place, New York City, 1914. Price $1.50, cloth boards.

This book can be recommended without reservation to anyone who desires information on electric mine-signaling. It must be said, however, that wireless methods are not discussed and that no reference is made to telephones or telephonic wiring.

The writer opens up his book with accounts of "ringing keys and tappers," starting with the regular telegrapher's key, which is only suited to dry places. He describes later gas- and watertight keys, some of which are actuated by pushbuttons and others by bell-pulls located outside the box which contains the actual key.

Then follows a section on the various types of bells—the trembling type, which is apt to make a continuous stream of sparks and is dangerous in gas, the single stroke, the shunt and the differential bells. The advantages of the different bells are all set forth, and also their disadvantages for certain classes of work. A review then follows of the different types of mounting, the author dividing all signal bells into wood-box bells, block-signal bells, waterproof bells, gas- and water-tight bells and magneto bells.

A chapter follows on electric mining indicators or annunciators, these being divided into mechanical and electric replacement indicators, needle and visual-signal annunciators, the latter with continuous relay and electrical replacement. Bell-signal indicators also have consideration. In the next chapter electric generators for signal work are considered and the utilization of available alternating electric power by the aid of transformers and rectifiers, two types of the latter being described—the vibratory and the "Adnil." Cells and their handling are treated at some length, the cells described being various types of the Leclanché cell—the porous-pot with flat and cylindrical zincs, the central zinc or carporous, the agglomerate-block and the sack cells. The Fuller, or bichromate, cell receives a notice.

The wiring for shafts and engine planes is elaborated at length, and an appendix concludes the book, giving the special rules for the installation and use of electricity in coal mines under the Metalliferous Mines Regulation Acts, the Coal Mines Regulation Acts and the British Home Office regulations under the Coal Mines Act as far as these refer to signaling. The regulations of the Bureau of Mines, made we presume for the mine at Gebo, Wyo., and the electrical symbols for mine maps suggested by H. H. Clark, fitly conclude this excellent little book on a subject hitherto somewhat inadequately treated.

Coal and Coke News

Washington, D. C.

The Bureau of Mines has prepared and has just issued Technical Paper No. 97 on the subject of "Saving Fuel in Heating a House." The paper first discusses various kinds of fuel and affords the following outline of the advantages and disadvantages of various fuels.

Fuel	Advantages	Disadvantages
Wood	(*a*) Cleanliness, (*b*) cheerful fire, (*c*) quick increase of heat, (*d*) cheap in some localities.	(*a*) Low fuel value, (*b*) large storage space necessary, (*c*) labor in preparation, (*d*) scarcity, (*e*) does not hold fire long, (*f*) unsteady heat.
Anthracite	(*a*) Cleanliness, (*b*) easy control of fire, (*c*) easier to realize heat in coal than is the case with other coals, (*d*) steady heat.	(*a*) High price, (*b*) difficulty of obtaining, (*c*) slower response to change of drafts.
Bituminous coal	(*a*) Low price, (*b*) availability, (*c*) high heat value (in the best grades), (*d*) low percentage of inert matter (in the best grades).	(*a*) Dirty, (*b*) smoke produced, (*c*) more attention to fire and furnace necessary than with anthracite.
Subbituminous coal and lignite	(*a*) Relatively low price, (*b*) availability (in some regions), (*c*) responds quickly to opening of drafts.	(*a*) Slakes and deteriorates on exposure to air, (*b*) takes fire spontaneously in piles, (*c*) heat value generally low, (*d*) heat in fuel difficult to realize, (*e*) fires do not keep well, (*f*) gases generated over fire pot sometimes burn in smoke pipe, causing excessive heating.
Peat	(*a*) In general, the same as for wood.	(*a*) Low heat value, (*b*) bulkiness.
Coke	(*a*) Cleanliness, (*b*) responds quickly to opening of drafts, (*c*) fairly high heat value.	(*a*) Bulkiness, (*b*) liability of fire going out if not properly handled, (*c*) fire requires rather frequent attention unless fire pot is deep.
Oil	(*a*) High heat value, (*b*) immediate increase of heat, (*c*) cleanliness, (*d*) small storage space necessary.	(*a*) High price, (*b*) difficulty of safe storage.
Gas	(*a*) Ease of control, (*b*) cleanliness, (*c*) convenience, (*d*) immediate increase of heat.	(*a*) High price in many places.
Electricity	(*a*) Every advantage.	(*a*) High price.

The paper next considers types of heaters suitable for residences and small buildings and reaches the conclusion that hot-water equipment, while most expensive to install, is probably least costly to operate.

Methods of operation of heaters while in use with various sorts of fuel are finally discussed, the main points developed being as follows:

"1. The amount of fuel consumed in heating a house depends on many factors. Some of the factors are within the control of the householder; others are not.

2. Both convenience of operation and consumption of fuel depend on the system of heating (and ventilation) installed, and convenience, fuel consumption, and first cost should be considered in making a selection.

3. The heater should be large enough to meet continuously and without attention for periods of eight hours the demands for heat in all weather except the most severe.

4. Heating equipment that burns satisfactorily and economically one kind or size of fuel may not be well adapted to burning another.

5. Ascertain by experiment what fuel and what method of using it are best suited to your needs. As a rule, the effort to obtain this information will be amply rewarded by the saving that will result.

6. Attend to the fire regularly and try to anticipate the demands for heat.

7. Keep the heat-absorbing surfaces of the heater free from soot and dust by regular cleaning.

8. Heating systems often fail to meet the demand for heat in severe weather because of insufficient draft. To supply additional heat, the heater must be able to burn more coal.

9. The more probable causes of insufficient draft are:

a. Chimney not high enough, or having its top too near some tall object.

b. Chimney, smoke pipe, or gas passages of heater clogged with soot or débris, sometimes through the breaking of a partition between two flues in a chimney.

c. Leaky connection of smoke pipe to heater or to chimney.

d. Accidental closing of hand damper in smoke pipe.

e. Clogging of fuel bed by clinkers.

f. Too great a length of horizontal smoke pipe between the heater and the chimney."

The following general suggestions are offered for the firing of different fuels:

"Fundamentally, the process of combustion is the same for all fuels. Whether the fuel be wood, coal, or oil, heat is produced by the carbon or other combustible elements combining with the oxygen of the air. The oxygen and these combustible elements unite in certain proportions at certain temperatures and a definite quantity of heat is evolved in each case. Some of the heat is absorbed by other parts of the fuel, heating them to ignition temperature, and some of the heat is absorbed by the nitrogen in the air supplied—ordinary air contains about 80 per cent. nitrogen—and by the gaseous products of combustion, raising them to a high temperature. Part of the heat radiated from the glowing fuel or conveyed by the hot gases passes over the heating surfaces of the boiler or furnace, is taken up by the water or air heated, and is distributed to the rooms of the house.

"The admission of more air through the fuel bed or fire door than is required to furnish the oxygen necessary for complete combustion tends to cool the fuel bed and the gases that rise from it. As oxygen unites with combustible elements in definite proportions, the theoretical amount of oxygen and hence of air needed for the complete combustion of a given weight of coal can be computed. However, in burning any kind of fuel on a grate, considerable heat is lost in unburned material if only the quantity of air theoretically required be admitted, because it is practically impossible to get all of the particles of combustible matter in the fuel to unite with all the particles of oxygen in the air theoretically required. An excess of air must always be supplied, but this excess should be neither more nor less than is necessary to insure complete combustion.

"The importance of providing an inlet for the air that must enter the furnace room is frequently overlooked, especially in small, tightly-closed furnace rooms. Roughly, 150 to 300 cubic feet of air are required for each pound of coal burned, and, to prevent trouble from insufficient draft, some means for admitting this air to the furnace room must be provided. Usually enough air leaks into the furnace room through cracks and poorly fitting windows, but the tighter the construction of the room the greater the need of an air inlet."

Then follow suggestions "which have to do especially with preventing incomplete combustion and the admission of a large excess of air into the furnace, and the minimizing of the attention necessary to maintain the proper temperature in the rooms heated."

HARRISBURG, PENN.

Employers of labor who have not yet a good understanding of the child labor law and the workmen's compensation bill passed at the last session of the Legislature may find assistance at the branch offices of the state which will be opened in the anthracite and bituminous coal field the latter part of this month.

A force of investigators has been employed to gather information as to the number of children employed about coal mines and other industries who will come under the continuation school requirements and as to the number of employees who will come under the provisions of the compensation act.

Children under 14 years may not be employed in any industry, but, children between 14 and 16 who are employed must be given instruction for a certain number of hours every week. Since they cannot very well be placed in classes with children who attend school regularly it is incumbent upon the authorities to make special provision for them. The working children may be placed in separate buildings or in separate rooms or they may be given instruction in offices of the collieries or mines or mills and factories in which they are employed, but the arrangements must be attended to by the school directors of the community.

It is doubtful if many of the larger coal companies will stand for this annoyance of adjusting their working conditions to the requirements of the law, and will discharge all boys under 16.

There is yet much doubt in the minds of many employers of labor as to their liability under the compensation, especially as to those who are only employed periodically and the insurance features of the act.

There are three ways to carry insurance. These are the state fund, mutual companies and the old-line stock companies. The state fund is a misnomer, for except for the first three and a half years, no state aid is offered. After that all cost must come out of the premiums. Hence the fund must be self-supporting. The one great advantage of insuring in the state fund is that on payment of the premium there is relief from personal liability, possible claims going against the fund and not the employer. There is no lien against his property. There is another side, however, to the state fund, it is pointed out. It can insure only on the compensation side of the law. It does not afford the broad insurance offered by the insurance companies. It cannot insure against suits at common law defense.

Mutual companies will be operated without profit, and whatever surplus accrues is returned to policyholders, while a stock company works primarily in the interests of its stockholders and secondarily in the interests of those who insure with it. The drawback of the mutual, which it is said is being considered by many coal companies, is that policyholders may be called upon for a second assessment within a year if a big loss is incurred which requires additional funds. But to offset this the insurer knows that in case there is a surplus he will get his share back.

PENNSYLVANIA

Anthracite

Tamaqua—The night schools for mine workers are beginning their sessions throughout the anthracite region, and mine workers are taking advantage of the courses of instruction. Students of these schools last spring secured approximately 20 mine foreman's certificates and 50 assistant mine foreman's certificates. The number of students now enrolled in these schools exceeds that in the membership of the mining institutes which were their forerunners.

Pittston—A track walker on the Lackawanna & Wyoming Valley R.R. (the Laurel Line), recently discovered a cave under the north-bound rails in time to prevent the wrecking of a train that was overdue. Mining in surface veins is believed to have caused the subsidence. The road has had much trouble with caving and once was obliged to re-route the tracks between Pittston and Avoca.

Lansford—All collieries of the Lehigh Coal and Navigation Co. are now working to full capacity. The demand for railway equipment is so great that a large number of foreign cars are being loaded.

Pottsville—After investigating the recent disaster at the Coaldale mine, James E. Roderick, chief of the State Department of Mines, has stated that there was no negligence on the part of the company officials or of the mining department. It had been rumored that the miners' organization intended to take action against the company.

The Schuylkill County court has upheld the Lehigh Coal and Navigation Co. in a suit to enforce a reservation in a deed restricting the sale of liquor on a piece of ground which the company sold at Coaldale. A saloon-keeper had endeavored to transfer his business to the property and the decision in this suit practically makes prohibition territory of all the company's land.

The Lehigh Valley Coal Co., on Oct. 9, announced the immediate resumption of work at the Blackwood colliery at Blackwood. There has been no work at this colliery since last June. Seven hundred men and boys will be given employment.

Shenandoah—All the collieries in this section worked full time the past week, the first time in 10 months. It was semi-officially announced on Oct. 9 that full time would continue in this region during the coming winter.

Bituminous

Uniontown—Operators in this region, confident that coke will reach the high-water mark of $3 by the first of March, if it does not go beyond that figure, are refusing contracts for a year's delivery at $2.25 a ton. Practically every oven in the region is now in operation and the output is practically on a capacity basis. The labor proposition is becoming a problem to the operators hereabouts and is causing them much trouble.

The sale of 3,000 acres of the West Virginia coal held by local people, which has been pending for the past few days, will not be consummated according to a statement of one of the interested parties. For nearly a week negotiations have been under way whereby a Pittsburgh concern was to secure the coal lands, but there is practically no chance of the deal being completed, the owners maintaining a stiff price for their holdings.

Elco—The last car of coal was hauled out of the old Vesta No. 2 mine a few weeks ago and the work of tearing up the tracks, removing the machinery and dismantling the plant generally is now under way. This famous old mine was known 30 years ago as the American works and passed through several hands before it finally fell into possession of the Vesta Coal Co.

Standard—Forty ovens were blown in at the Standard mines of the H. C. Frick Co., recently, giving employment to additional men and putting 90 per cent. of the ovens into operation. Thirty additional ovens have also been fired at the Dorothy plant of the Frick company.

Pennsville—The plant of the Pennsville Coke Co. is being dismantled and the equipment sold. Operations ceased about two years ago after 41 years of almost continuous activity.

Connellsville—The Connellsville coke region is now producing approximately 400,000 tons of coke per week. The H. C. Frick Coke Co. recently put 500 additional ovens into operation, and the majority of the plants are working full time except when handicapped by labor scarcity. There appears to be no actual car shortage but railroads are pressed to provide adequate transportation facilities.

WEST VIRGINIA

Kingwood—The Deaker Hill Coal Co. recently became the owner of several coal tracts situated in the Kingwood district along Morgans Run. It is intimated that the coal will be operated in the near future. It is believed that an opening will be made on Morgans Run near Irona, the coal being shipped over the West Virginia Northern R.R.

Charleston—It is estimated that 8000 Greeks will leave the mines of West Virginia within the next few months. It is thought that the shortage resulting from their departure will be even more serious than that due to the recall of the Italian reservists.

The Supreme Court of Appeals recently granted an alternative writ of mandamus against Lee Ott, state compensation commissioner, compelling him not to require the United States Coal & Coke Co. to pay the sum of $17,054.79 or any part thereof which the commissioner demands, as the proportionate part of all liabilities against the Workmen's Compensation Fund, or show cause why he should do so. This writ is returnable Oct. 19.

Grafton—One hundred and eleven men recently took the examination for mine foreman and fire boss. It was anticipated that not over 100 candidates would present themselves, and the increased number which appeared was highly gratifying to the men in charge.

Morgantown—It is reported that the Powellton and Elk Ridge operations will work every day for at least one year. It is reported that the coal company has closed some fine contracts, to fill which will require the constant operation of all the mines on Armstrong Creek for a period of not less than 12 months.

Wheeling—It is reported that a car shortage throughout the state is handicapping coal operations. The main cause, it is said, is the commandeering of coal cars for the handling of farm crops in the West, the crop which takes most of the coal cars being said to be sugar beets.

Huntington — Communications have been received from coal companies in the Logan field asking the employment bureau here to furnish as many as 200 miners at once for immediate employment in their fields. The Ethel and Bengal coal companies have made requests for large numbers of miners in the past few days.

ALABAMA

Dogwood—The Montevallo Domestic Coal Co. which was organized recently, has opened a slope which was started some few years ago on the Montevallo seam. This will shortly be shipping a good output of coal, the average thickness of the seam being 3 ft. 9 in. of clean fuel.

TENNESSEE

Harriman—Creditors of the Big Brushy Coal Co. of Petros, which recently went into a receiver's hands, have decided to continue the business.

KENTUCKY

Whitesburg—There is little car shortage complaint now among the coal operators of the eastern Kentucky field. Operators have no trouble to get all the cars they can load. All the mines of the Elkhorn field are running full time.

The Diamond Block Coal Co. has several hundred men at work constructing a mining town on the Buffalo Creek branch of the Louisville & Nashville Ry. in Perry County.

INDIANA

Fontanet—The Coal Bluff Mining Co.'s mine which has been closed for a large part of the summer has been reopened with a full force, about 400 men.

ILLINOIS

Marion—The West Virginia Coal Co., which has been operating a mine on the Iron Mountain R.R. at this place, is making arrangements to sink another shaft 1½ mi. north of the present one, on the Illinois Central R.R. Work is to be begun soon. The present mine has an output of 1500 to 2000 tons a day. The new shaft will enable the company to greatly increase its output and ship by the Illinois Central as well as the Iron Mountain. The company also has some inner group mines near Belleville.

Marissa—The Egyptian Coal & Mining Co. has resumed operation at its mine here after having been closed down for a year on account of business depression. Electric mining machines have been installed. The mine will give employment to 75 men. The output will be handled by the Kolb Coal Co., St. Louis.

Mount Olive—The Progressive Club of Mount Olive held a mass meeting a few days ago to discuss steps to prevent the closing down of Mine No. 5. The Madison Coal Co., which owns the mine, has decided to abandon it but will leave it as it stands and lease it if some arrangement to that end can be made. The mine is said to be in good condition, with enough coal to run for several years.

New Baden—The New Baden mine of the Southern Coal & Mining Co. is soon to be closed and coal taken for all requirements from the company's mines at Belleville, the Little Oak and the Shiloh. The New Baden mine has been working steadily and the other two only about half time. It is announced that the two mines will be worked regularly after the New Baden mine is closed. The two mines employ 700 men.

IOWA

Des Moines—Owners of the Miners' hospital at Albia have acquired the Drake university medical building and grounds in this city to be used primarily as a hospital for coal miners in this vicinity. The institution will be known as the Iowa Industrial Hospital of Des Moines and will be operated under plans similar to the one at Albia excepting that the field of operation will include employees of various other industries as well.

Knoxville—The state board of control is prospecting for coal at the Knoxville inebriate asylum, in hope of striking veins of sufficient thickness to supply various state institutions. Workmen report finding a 3-ft. vein. Additional borings will be made to determine whether it is continuous. The board of control uses 110,000 tons of coal annually at the state institutions, and if even a portion of the fuel can be mined at Knoxville, a big saving can be made.

TEXAS

Lytle—The Lytle Coal Co. has begun the sinking of a shaft near the mines of the Carr Coal Co. which were operated here up to about two years ago. The new mine will be developed at once. About 50 men are at work sinking the shaft.

OKLAHOMA

McAlester—Increased activity in the coal fields here is reflected by increased pay rolls of the mines operating in this section. Coal operators say the activity here is due largely to the increased demand for export coal. The monthly pay rolls of the mines in this district will amount to $600,000. At present 10,000 tons of coal is being produced daily.

COLORADO

Denver—Examinations by the board of examiners for mine official certificates will be held in nine cities of the state during November. These examinations will be as follows: Glenwood Springs, Nov. 8; Grand Junction, Nov. 9; Gunnison, Nov. 11; Canyon City, Nov. 12; Walsenburg, Nov. 15 and 16; Trinidad, Nov. 17 and 19; Colorado Springs, Nov. 20; Denver, Nov. 22 to 24; Steamboat Springs, Nov. 26.

FOREIGN NEWS

Nanaimo, B. C.—Thomas Graham, provincial inspector of mines of British Columbia, and J. H. Tonkin, manager of the Pacific Coast Coal Co., Nanaimo, B. C., were recently committed for trial by Magistrate Scott of Nanaimo on a charge of manslaughter arising out of the accident at the Reserve mine last February in which 20 lives were lost. It is charged that inaccurate maps of the mine and of adjoining mine workings were allowed to be used by the officials.

Toronto, Ont.—The annual report of the Mines Branch of the Department of Public Works of Alberta for the calendar year 1914 shows a total coal production of 3,821,739 short tons, being a decrease of 421,034 tons as compared with 1913. Of the total output 1,953,367 tons was bituminous, 1,697,401 lignite and 170,971 anthracite. The total number of mines in operation was 264. The number of new mines opened was 42 and the number of mines abandoned 45. The average number of persons employed was 8,170. Coke was produced to the amount of 29,058 tons and briquettes to the amount of 109,082 tons. The number of deaths caused by accidents inside the mines was 208, which includes 189 persons killed in the Hillcrest disaster, in addition to which 35 persons were seriously and 45 slightly injured by accidents inside the mines. Considerable progress has been made in training for mine-rescue work, a station having been installed and equipped at Taber and a mine rescue car in the Canmore district. Instruction in mine-rescue work was given to 330 persons. The report notes that apart from the Hillcrest disaster 41 per cent. of the accidents occurred in mines producing under 100,000 tons per year, which is probably due to the fact that mines where fewer than 30 men are employed are under the charge of men who do not hold first-class certificates and are not as conversant with the provisions of the Mines Act as those in charge of the larger mines.

PERSONALS

John Whelan, Jr., of Massillon, Ohio, has accepted the position of secretary of the Pittsburgh Vein Operators Association, succeeding John Zelenka.

N. S. Hachita, an engineer for the Lehigh Valley, spoke on "Concrete and Its Ingredients," at the opening fall session of the Pittston Mining Institute.

Owen C. Jones, of St. Clair, Penn., by appointment of the Schuylkill County board, succeeds James Kennedy as mine foreman examiner of the eighth anthracite district.

John C. Williams, foreman at Thomas shaft, and John McNulty, foreman at Butler colliery, of the Pennsylvania Coal Co., have been transferred, each taking the other's place.

W. O. Davis, secretary and treasurer of the Kentucky River Coal Corporation is spending several weeks in Hazard, Ky., clearing up a mass of detail work which has accumulated at the office.

Charles W. Mills, president of the Climax Coal Co., with offices in Philadelphia, was on Oct. 9, appointed by Secretary Wilson as a Federal conciliator to settle the strike of machinists in the job shops in Pittsburgh.

Samuel Dunn, of Chicago, editor of the "Railway Age Gazette," will speak in Louisville, Ky., on Oct. 19 under the auspices of the Louisville Transportation Club. He will talk on the relations between shippers and carriers.

J. L. Good, vice-president of the Pittsburgh & Buffalo Co., has severed his connection with that firm and accepted the position of general sales manager of the National Coal Co., of Cleveland, Ohio, with offices in the Rockefeller Bldg.

Samuel Anderson, for many years assistant mine foreman at the Seneca colliery of the Lehigh Valley Coal Co., has been appointed inside foreman at the Maltby colliery, at Maltby. He succeeds D. P. Thomas, who has been ill for a long time.

James Martin has severed his connection with the Paint Creek Collieries Co., and accepted the position of general manager of the Wyatt Coal Co., the McGregor Coal Co., the McCaa Coal Co., and the Macalpin Coal Co., with offices in the Union Trust Bldg., of Charleston, W. Va.

John F. Nuttal, a former mine manager of Southern Illinois who disappeared from Christopher, Jan. 19 last, has written to his wife, who is at Marion, Ill., that he is now a sergeant-major in the Royal Engineers of the English Army. The letter was written from Southampton, England.

OBITUARY

C. E. Sauters, of Martins Ferry, Ohio, superintendent of the Gaylord mines Nos. 1 and 2, died recently in St. Joseph's Hospital in Elmira, N. Y., following a long illness from a complication of diseases. He is survived by a wife and five children.

William Parker, of Toronto, Can., died suddenly Oct. 5. He was at one time a well-known coal operator, and controlled several Pennsylvania mines, but retired from active business some years ago on account of ill health. He was 60 years of age at the time of his death, and is survived by four sons and three daughters.

INDUSTRIAL NEWS

Dorothy, Penn.—The Dorothy plant of the H. C. Frick Coke Co. recently received orders to fire up 30 additional ovens. This makes 160 ovens out of 230 in blast at this plant.

Middlesboro, Ky.—All records for traffic on the C. V. division of the Louisville & Nashville were broken on a recent Saturday when 500 odd loaded cars, mostly coal, and 100 empties passed over into Corbin.

Des Moines, Iowa — The principal office of the Carney-Cherokee Coal Co. has been transferred from this city to Carney, Iowa. An amendment to the articles of incorporation has been filed, providing for the change.

Frankfort, Ky.—The Federal Court has now under trial the case of the Kentucky Coal Lands Co., of New York against the Mineral Development Co., of Pennsylvania. This suit involves the title to 12,000 acres of coal land in Letcher county.

Huntington, W. Va.—It is stated that the Kentucky Mine Owners Assn., recently held a committee meeting adopting resolutions protesting against the proposed advance in rates on West Virginia coal destined to the markets of the Northwest.

Charleston, W. Va.—The coal carrying railroads have decided to file with the Interstate Commerce Commission a revised tariff which would increase the freight rate more than 25 cents per ton on eastern shipments from the West Virginia coal fields.

Des Moines, Iowa—First-aid teams are to be established not only in coal mines about Des Moines but also in the different industrial establishments. These teams will be instructed in giving first aid for all injuries from fractured limbs to broken backs.

Paducah, Ky.—Officials of the West Kentucky Coal Co. estimate that their losses in the recent hurricane at New Orleans will reach $170,000, involving as it did 72 loaded coal barges which went down. These were not insured. They sunk off Donaldson, La.

Charleston, W. Va.—Officials of the Chesapeake & Ohio R.R. recently met in this city to discuss the car shortage which has now existed for about five weeks, and which is the first one in approximately three years. It was stated, however, after the meeting that no immediate relief was in sight.

Ridgway, Penn.—The Erie R.R. is said to have recently received an order for 1,000,000 tons of coal, and it is said that shipment from Brockwayville mine has already commenced. It is reported that the coal is to be sent abroad from an eastern port. Four hundred train loads will be required to fill the order.

Greensburgh, Penn.—The Pittsburgh Coal Co. has entered suit against Jesse H. and Jacob L. Steger to recover the sum of $3,500 for coal alleged to have been mined by the defendants from the coal lands of the plaintiff. A total of 1,769 tons of coal is alleged to have been mined by the Sager Bros. from the plaintiff's holdings.

Natchez, Miss.—The Pittsburg Coal Co. is making an effort at this place to ascertain if any of its 13 barges which went down in the storm of Sept. 29 can be raised and salvaged. Lines have been attached to one of the pump boats which sunk, and it is thought that it may be recovered, but the fate of the other pump boats and barges is problematical as yet.

Columbus, Ohio—The first of a number of suits of the New York Coal Co. against the Sunday Creek Coal Co. for royalty on leases of Ohio coal lands was recently decided in favor of the plaintiff. The jury returned a verdict for $4536 and interest against the Sunday Creek Coal Co. for leased land at Orbinton, Hocking County. The royalty is 7½ cents a ton for all coal mined.

Pittston, Penn.—With the hope of securing the $5000 bonus offered in its contract for the completion of the Ewen breaker, of the Pennsylvania Coal Co., replacing the structure burned last winter, by Jan. 1, 1915, the contracting company is redoubling its activity. The breaker is to be of concrete and steel entirely and will be absolutely fireproof. The framework is largely up.

Whitesburg, Ky.—A transportation of about 100 laborers, mostly foreigners, arrived in Fleming recently to be employed by the Elkhorn Mining Corporation. Other increases and extensions are promised by the company in its different plants in order to fill large orders which are now on hand for future delivery. Mining activities are daily increasing in the eastern Kentucky field.

Charleston, W. Va.—Operators of southern West Virginia state that large amounts of coal have been ordered by the French Government from producers along the Chesapeake & Ohio and Norfolk & Western railroads, and that the time limit for delivery is six months. One company alone is said to have accepted an order for 600,000 tons, and it is said that this order is the smallest of many.

Chicago, Ill.—Both the Knox County operators and those of the Clinton field have perfected sales organizations something along the lines of the Franklin County, Illinois system. The Knox County operators intend to conduct an educational campaign designed to teach the public how to obtain the best results from their coals, and are looking for an efficiency engineer to take charge of this work.

Wilkes-Barre, Penn.—The Nordberg Mfg. Co., of Milwaukee, Wis., recently received an order for two steam and two electric mine hoists from the Lehigh & Wilkes-Barre Coal Co. The Nordberg company has in the past constructed hoists mostly for large metal mines of the Lake Superior and Western districts, although in a few cases hoists have been built for coal mines. The steam hoists in this order will be among the largest and most complete in the anthracite region.

Wilmington, Del.—The property and business of the E. I. du Pont de Nemours Powder Co., of New Jersey, was recently sold and transferred to E. I. du Pont de Nemours & Co., of Delaware, which corporation was organized for the purpose of taking over and carrying on the business. The new firm assumes all liabilities of the old company except capital stock and sundry debts, and will carry out all contracts of the old firm, there being no change in the personnel of the management, operation, or methods of handling business. The capital stock of the new corporation amounts to $120,000,000.

New York, N. Y. — Charging that the Delaware, Lackawanna & Western R.R. has failed to collect demurrage on barges detained at the New York Lighterage station the Federal Grand Jury has returned 20 true bills against the company for failure to apply the rules of the published tariffs as approved by the Interstate Commerce Commission, and which the Government will endeavor to prove is a violation of the Elkins law. The indictments were brought on offenses alleged to have been committed on shipments of anthracite coal from Pennsylvania to New York from October, 1912, to October, 1914.

Superior, Wis.—Negotiations for the leasing of the Sunday Creek Coal Co.'s dock to the Lehigh Valley Coal Sales Co. have been concluded, and Superintendent Emil Emmert recently took charge of the dock on behalf of the Lehigh interests. Only that portion of the dock which has been used for handling and storing anthracite will be utilized by the Lehigh firm, and it is said that the terms under which the dock has been leased are virtually a contract, whereby the Sunday Creek company handles anthracite for the Lehigh firm during the coming winter. The contract only runs until next spring.

Toronto, Ont.—Thomas Richardson M. P., of Whitehead, England, representing the English coal miners' unions and Richard Baird, a representative of the British colliery owners, are in Canada on their way to the Pacific Coast. There are upwards of 3000 British Columbia miners out of work and the unions there communicated with the English unions asking if these men could be taken to England and employed in the coal mines there. A large proportion of the British Columbia miners are from the British mining districts, and it is anticipated that Messrs. Baird and Richardson will take back many of them to their native localities.

Pittston, Penn.—With an avalanche of orders that poured in with the first frost and heavy shipments for storage purposes, the coal mines of the Upper Anthracite field are working steadily, after a summer of spasmodic operations. The effect is apparent in the action of the railroads in calling on crews and extra men who were practically idle during the warm months. For weeks steadily, the Lehigh Valley has been stocking freshly mined anthracite at the rate of 125 cars per day in its storage plant above Coxton Yards and reports of heavy storage are being received from other roads traversing this district. There is furthermore a heavy demand for steam sizes, indicating that other industries are piling up anthracite for commercial uses.

Coal Trade Reviews

General Review

Anthracite distribution at record rate for the season and prices stiffer. Growing labor and car shortages the features of the bituminous situation. Spectacular advance in vessel rates restricts exports. Consumption in iron and steel lines at maximum rate.

Anthracite—Prices have materially stiffened, and while individuals are still occasionally offering slight concessions, the large companies are slowly but surely getting the situation well in hand. Distribution is at the record rate for the season to date. Shortages of certain kinds of equipment have been reported in the mining regions, and some of the companies have already been forced to draw on their storage supplies. Thick weather along the coast has effected shipments to down East ports, and some anxiety is developing at points where navigation closes in November. The outlook is for a favorable business throughout the balance of the year.

Bituminous—There is no particular snap to the trade, but the market is steady and firm. Determination on the part of the agencies to realize better prices, supported by the decidedly favorable turn to general business conditions, are more responsible for the improved situation than any insistent demand. Very slight price advances are noted on certain grades that railroads are stocking heavily. Agencies generally have fair orders on hand, particularly for shipment all-rail. Labor and car shortage continue the leading features of interest. Attractive wage offers in other lines, such as the steel industry, are drawing men away from the mining regions, while shortage in transportation facilities is crippling mine operations seriously. The market is sensitive and will respond quickly to any interruption in operations or sharp increase in demand.

Exports—Vessel rates on coal fixtures to Italian ports are at a prohibitive level and no charters for that country have benn announced during the past week for the first time in a long period. The situation in this respect is general all over the world as is evidenced by the sharp advance in English rates following the withdrawal of Greek vessels from British shipping; remarkable high freights are being reported from England to South American ports. The export movement in consequence, is light from all American ports, but it is clear that the relapse is regarded as only temporary; the generally feverish interest is still noted in export circles and the larger companies continue sending representatives abroad.

Lake Trade—Coal çonsumption in iron and steel lines is running easily ahead of all previous records. Cooler weather has also given a mild impetus to domestic trade while the railroads are consuming a larger tonnage and putting some coal into storage. It is evident that there is less pressure to sell consignment coal while renewal of orders are more frequent. The car situation grows more ominous as the season advances; some roads have even announced that only 75% capacity allotment will be made for the time being, and the shortage is spreading to all parts of the country. The vessel situation for shipment up the Lakes is also becoming acute. Every effort is being concentrated on getting all the ore down the Lakes possible, and vessel owners are showing a disposition to abrogate contracts with coal shippers rather than lose time loading and discharging coal.

Middle Western—Lower temperatures have brought a real snap to the domestic business, and there has been a general broadening of the demand in all directions. Rail shipments out from the upper Lake ports have been the largest of the season to date. The demand is heavy enough to stiffen prices, and still further advances are anticipated in the very near future. Some operators are reporting unfilled orders on hand. The reaction following the increase in freight rates to the Northwest has been scarcely preceptible. Mines are slowly getting under full operation, or as full as the restricted car supply will permit.

A Year Ago—Anthracite steady but lacking the customary snap at this time. Bituminous continues to drag and the export business is scarcely above normal. All markets are much dependent on colder weather. Lake shipping is somewhat better.

BUSINESS OPINIONS

Boston News Bureau—So far as one can see the only real danger in the situation lies in over confidence. Everything that goes to make up a perfect condition of affairs seems to be with us. The products of the soil, the representatives of real wealth, are all that we could wish, and in view of the prospective demands of the world, are of more importance this year than ever before. As a nation we are in a position to take advantage of all our opportunities, and we are prepared to do so. We never knew our abilities because we were never put to the test before. The whole world today recognizes our power, financially and commercially. Our profits from the European war are accumulating and are giving us more courage in new undertakings. This is beginning to show already, and the outlook is for a tremendous growth in this direction. It is difficult to set the limit for this onward push. General business sentiment is steadily growing stronger, because people can begin to see definite signs of the improvement.

Iron Age—The volume of current business for 1916 delivery is not as great as might be expected with steel as scarce as it is and with the expectation general that this tightness will continue for months. Few mills are making any effort to sell for any part of next year, but the Steel Corporation's gain of 400,000 tons in unfilled orders is taken to mean that it has done more selling for the first half than its competitors. Some of the steel companies are holding off because they are well sold up for several months and look for higher prices. Apparently buyers for European governments have failed to appreciate the rate at which the mills have been filling up. France has held back large requirements for the first half of next year which must soon be placed. Italy has been asking for barb wire, plates, billets and bars running up to 100,000 tons and has encountered rising prices on all sides.

American Wool and Cotton Reporter—Improvement in the wool market continues. Fundamental conditions point toward great strength for considerable time ahead. Inquiries are being made indicating that manufacturers will buy more before long. Dealers have recovered from their worry over the removal of the embargo on crossbreds. The foreign markets are strong. The woolen goods market is in a generally satisfactory position and a rather radical improvement is looked for during the next few weeks. The outlook is more favorable in cotton goods and the prospect for still greater activity exists.

Dun—Current trade reports reflect the best conditions and prospects in many weeks, few obstacles to progress now being in evidence. Removal of important restraining influences imparts needed stimulus to new enterprise, and launching of many deferred undertakings attests the widespread confidence. While labor controversies are a drawback in some directions, notably in the East, troubles of this nature are usually adjusted before serious losses are sustained either by employers or wage earners. Broadly considered, the mercantile situation is steadily approaching a state of normal activity.

Southern Lumberman—Tangible and definite improvement of a character most gratifying to manufacturers and dealers alike is revealed in reports on the yellow pine market. Latest statistical reports made to the officers of the Southern Pine Association show the balance of orders on hand at 137 mills for the week ending Friday, Oct. 1, to be nearly 20,000,000 ft. in excess of unfilled orders at the same mills at the end of the previous week. While improvement in the hardwood market is not so marked, it is nevertheless becoming more general as the fall season advances. The betterment is slow, but is now recognized by shortage of stocks that are frequently inquired for.

Bradstreet—In the economic situation performance follows promise at a rapid pace, and as unfavorable factors are eliminated, even lagging lines are brought in touch with the circle of growing activity. Industry shows notable activity. Shipyards are working at top speed, eight of the country's crops are of record proportions, this week's bank clearings reached peak point, textile mills are on full time, but the advance in cotton as well as the burdensome price of dyestuffs reduces profits. Building values for September show a sharp gain over last year, our relations to international political affairs are seemingly more reassuring than at any time since the European war started, and almost everywhere in the country optimism is rife.

Marshall Field & Co.—The dry goods business of the week has responded to the seasonable weather by an increase in wholesale shipments and more customers have been in the market than during the same period a year ago. The low stocks that retailers are carrying makes wholesale distribution a very sensitive barometer of the current dry goods business throughout the country. Collections show some improvement over those of the corresponding week last year. The cotton market continues firm with strong upward tendency.

ATLANTIC SEABOARD

BOSTON

Prices are generally firm on Pocahontas and New River, but market rather sluggish. Georges Creek steady, and only slight improvement on Pennsylvania grades. Water freights unchanged. Anthracite demand brisk.

Bituminous—The trend of prices on Pocahontas and New River is steady and firm, although occasionally inducements are made by various shippers to move accumulations. There is no snap to the market as yet; it is a situation that comes more from the determination of the operators to net better prices than any very insistent demand for coal. A week of fair weather causes things to look quiet again. Off-shore inquiry is also a little lighter, although the lull in that direction is considered only temporary.

Very little buying has developed in the past week. There are a few consumers who must place orders during October but there is apparently no haste on their part. Recent circularizing of prices on cars for delivery after Apr. 1 next have had some thing to do with this lack of interest among buyers. Arrivals are about normal, but practically all the coal received is on contracts. Perhaps less coal is available for spot sale than for a month past, but seasonable weather would be a great boon to this market.

Of Georges Creek there are ample supplies at all the loading ports. The demand is quiet but very nearly a normal tonnage is being received here on contracts. Export trade has also eased up somewhat on this grade.

The Pennsylvania coals are in somewhat better position than in July and August, rumors of the shortage helping to induce consumers to take on extra tonnages. All-rail there has been better business on this account, but after a month or so it will need some other factor to give any spurt to the trade. Prices are slightly firmer for spot coal but only on the better grades.

Water Freights maintain the level reached a week ago, 80c. continuing the rate to Boston from Hampton Roads on 3000 tons upward. From New York ports to Providence and New Bedford rates are firm at 45c.

Anthracite—The wholesale demand is brisking up and with some of the shippers there is now more or less delay. All the domestic sizes, not excepting chestnut, are in good request and in most cases there is a marked shortage of steam sizes. The retail trade continues active and the outlook is favorable for the balance of 1915. The prolonged thick weather along the coast has affected shipments to quite a degree, and at points where navigation may close the last of November there is beginning to be some anxiety over getting forward the usual quota.

Bituminous quotations, f.o.b. loading piers at ports designated, are about as follows per gross ton:

	Philadelphia	New York	Baltimore	F.o.b. Mine
Clearfields	$2.15@2.65	$2.45@2.95	....	$0.90@1.40
Cambrias and Somersets	2.40@2.90	2.70@3.20	....	1.15@1.65
Georges Creek	2.92@3.02	3.22@3.32	$2.85@2.95	1.67@1.77

Pocahontas and New River prices, on cars Boston, are $3.55@3.73, Providence, $3.50@3.68, and f.o.b. loading port at Hampton Roads, $2.80@2.85.

NEW YORK

Cool weather forcing out anthracite orders. Individual prices close to circular. Bituminous shares in the improvement. Labor and car shortages developing.

Anthracite—The anthracite trade is showing gradual improvement. The weather has been mild, but still cool enough to make fires necessary and a good deal of coal has been going into consumption. Consequently retail dealers have been in the wholesale market, and distribution in all lines of trade is now on a larger scale than since the early days of spring. Most operations are now working full time, with labor in the regions growing scarce.

With the demand showing so much improvement, there is but little individual coal now being offered off the circular. Chestnut coal is active in all directions, line shipments of this size taking care of the entire output of some of the individual operators. At Tidewater, it has strengthened materially the decrease in shipments having brought about an excellent demand for rail deliveries. Stove continues in good demand, with egg the weakest of the prepared sizes.

The buckwheats are in good call, with the supply of free coals diminishing. Some of the large companies are finding fresh mined supplies inadequate to take care of orders, and are quoting purchasers on storage stocks. Prices in practically all instances on the steam sizes are up to the full circular, with only the lowest grades offering at concessions, which have grown relatively small.

Current quotations, gross tons, f.o.b. New York tidewater, are as follows:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$5.05		$5.10	
Egg	5.30	$5.20@5.30	5.35	$5.25@5.35
Stove	5.30	5.20@5.30	5.25	5.25@5.35
Chestnut	5.55	5.30@5.55	5.60	5.35@5.60
Pea	3.50	3.25@3.50	3.55	3.50@3.55
Buckwheat	2.75	2.25@2.75	2.80	2.25@2.80
Rice	2.25	1.85@2.20	2.30	2.00@2.30
Barley	1.75	1.50@1.75	1.80	1.25@1.80

Bituminous — The tidewater bituminous situation shows more strength though prices on spot coals are not materially altered. Shippers are trying to impress the buyers with the fact that car shortages are already growing serious, and that production is being crippled thereby, but the result of this campaign has so far failed to create much of an impression in-so-far as spot prices at Tidewater ports are concerned. Prices at the mines are on a higher scale than the Tidewater quotations would indicate. This has resulted in a scaling down of shipments of unsold coal to tide to await prospective buyers, as operators are finding it possible to move coal now, at fair prices, to all rail consumers.

Labor shortage is materially restricting production. Miners are becoming scarcer as the steel and other industries increase their activities and bid against the operators for men. With most of the companies having a good portion of their output tied up until April first, they are not in position to hold out when it comes to paying workmen an increase that they cannot pass on to their customers.

Coke industry is very active and absorbing a lot of coal that would go into the steam trade ordinarily. Export shipments are showing a slump because of the tightened situation in ocean freight rates. Bunker trade is heavy.

Current quotations New York tidewater, per gross ton, are on the following basis:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.20@3.30	$3.20@3.30	$3.20@3.30	$1.75@1.85
Georges Creek Tyson	2.90@3.00	2.95@3.00	2.95@3.00	1.40@1.45
Clearfield:				
Medium	2.65@2.80	2.65@2.80	....	1.10@1.25
Ordinary	2.65@2.70	2.65@2.70	....	1.10@1.15
Broad Top Mountain				1.10@1.45
Cambria County:				
South Forks	2.90@3.05	....	....	1.35@1.50
Nanty Glo	2.80@2.85	....	....	1.25@1.30
Barnesboro	2.65@2.70	....	....	1.10@1.15
Somerset County:				
Quemahoning	....	2.80@2.90	2.80@2.90	1.25@1.35
Medium	2.65@2.70	2.65@2.70	2.65@2.70	1.10@1.15
Latrobe	2.45@2.65	....	....	1.00@1.10
Greensburg	2.85@2.90	....	....	1.20@1.25
Westmoreland	3.20@3.30	....	....	1.40@1.50
West Virginia Fairmont ¾		2.70@2.80	2.70@2.80	.90@1.10
Fairmont mine-run		2.60@2.70	2.60@2.70	.80@ .90
Steam		2.55@2.60	2.55@2.60	1.00@1.05
Western Maryland		2.35@2.40	2.35@2.40	.85@ .90

PHILADELPHIA

Anthracite has good week. Price stiffening. Stove leads, with chestnut fair and egg dull. Pea still the source of trouble. Collections shaping up well. Bituminous trade fair, with poor car supply causing trouble. Prices generally stationary.

Anthracite—Business has improved, but it is possible that of the individuals has suffered to some extent. The shippers prices have undoubtedly stiffened and while the big companies are adhering to circular the individuals occasionally take an even chance for the trade. Considerable business has been lost to the largest shippers by the individuals dropping the state tax. However, the large companies are rapidly coming into control as they usually do at this time of the year.

It has been an active week and the retailers have actually been busy. If it were not for the regrettable and apparently inexcusable price war in certain sections of the city, the business would have a fine start for the retail men as they go into the first of the six months of activity that looms before, to which they all have been looking forward so long and which the shippers especially predict are bound to be exceptionally active.

Pea is quite a problem just now; it is in strong demand at $2, usually with the tax, but it is not moving as rapidly as expected. Sales of this size should be very heavy at this time, especially this year when conditions are so very unusual. Shippers strongly hint that prices will advance. It is just possible that the large buyers are protected in a quiet way at the $2 price until the first of the year and this is leading the small buyer, who is not carrying capacity stocks by any means. Considerable "jockeying" of prices on this size is noted which may eventually result in quotations not getting any higher for some months to come.

It is the logical season to buy, before freezing weather comes making the preparation of all coal more or less uncertain and also difficult to unload. Yet despite these reasons there is no unusual demand, all orders being filled, and this is difficult to understand in face of the fact that the retail men are busy and most of the coal going out of their yards is pea size.

Chestnut is improving but it can still be bought at less than circular and the price usually varies with the size of the order. Stove maintains its position as the leader and the circular is firmly maintained. Egg is hard to move, with the individuals who are understood to have considerable on demurrage at the collieries. Buckwheat continues active and the supply of this size will probably be shorter as the season advances. Rice is plentiful and there have been a number of instances where it has been offered at 20 to 25c. off circular, but with very little success.

The short car supply has forced several collieries to shut down due in part to the lack of certain kinds of equipment.

Collections are better than for some time as dealers realize that when the rush begins the delinquents will have to take second choice. Movement of anthracite to Tide points continues good.

Quotations, exclusive of the Pennsylvania State tax of 2½%, per gross ton f.o.b. cars mines and at Port Richmond are as follows:

	Line	Tide		Line	Tide
Broken	$3.50	$4.75	Pea	$2.50	$3.25
Egg	3.75	5.00	Buckwheat	1.25	2.25
Stove	4.00	5.00	Rice	.85	1.75
Chestnut	4.15	5.25	Barley	.50	1.50

Bituminous—Most shippers have good orders in hand but there is no rush. A peculiar situation prevails in that the car supply is short without any concurrent briskness in the coal trade. Prices have not varied much with the exception of Fairmont coal; railroads have begun to accumulate stocks of this grade and the increased demand has advanced the price an average of 5c. per ton. There seems to be something of a lull in the export trade, but this is regarded as only temporary. Quite a number of local mining interests have representatives abroad, and this week still another of the large companies sent an agent to France.

Average prices per gross ton prevailing in this market are as follows:

Georges Creek Big Vein	$1.70@1.80	Fairmont gas, ¾	$1.25@1.35
South Fork Miller Vein	1.55@1.65	Fairmont gas, mine-run	1.10@1.20
Clearfield (ordinary)	1.15@1.25	Fairmont gas, slack	.75@ .85
Somerset (ordinary)	1.10@1.20	Fairmont lump, ordinary	1.05@1.15
West Va. Freeport	.95@1.05	Fairmont mine-run	.95@1.00
		Fairmont slack	.70@ .80

HAMPTON ROADS

Movement slows down appreciably. Foreign shipments mostly to Italy. Normal accumulation at Tidewater.

The movement of coal from Hampton Roads ports during the week has not been as heavy as anticipated. both coastwise and foreign shipments being somewhat light. Export cargoes were principally to Italy going to Reggio, Genoa, Civita Vecchia, Naples, and Taranto. Coastwise shipments have been made to the New England market and have consisted principally of run-of-mine Pocahontas and New River although there has been some movement of high volatile.

The demand in both the home and European market has been light all week and so far as can be ascertained no large sales have been made for prompt movement. The accumulation of coal on the railroad yards is around normal with a fair supply in the storage plant at Sewall Point. Coal is constantly being dumped into this storage plant but some has been reloaded for shipment and it is difficult to ascertain what quantity is actually on hand.

Railroad Tonnages—Dumpings over the local piers for the past five weeks compare as follows:

	Week Ending				
Railroad	Sept. 11	Sept. 18	Sept. 27	Oct. 2	Oct. 9
Norfolk & Western	156,459	182,047	163,400	131,055	140,934
Chesapeake & Ohio	93,260	87,686	91,341	72,996	93,344
Virginian	70,855	59,597	79,176	59,997	65,150
Totals	320,574	329,330	333,917	264,048	299,428

Ocean Charters, Clearances and Freights

VESSEL CLEARANCES

The following steamers have cleared from various ports, during the week ended Oct. 9:

NORFOLK

Vessel	Destination	Tons
DORIS[1]	Genoa	2,088
Goulandris[2]	Genoa	4,688
Carlo[3]	Genoa	7,145
Rollins[4]	Kingston	1,500
Bris[5]	Pernambuco	1,630
Dorothy[6]	Pernambuco	1,225
Coniston Water[2]	Civita Vecchia	4,467
Wardha[3]	Reggio	5,500
Tea[3]	Gibraltar	7,060
Acon[2]	Cristobal	9,248
Rosalia[2]	Naples	9,059
Uranus[3]	Gibraltar	5,300
Stephen[7]	Brazilian ports	990 (Part cargo)

NEWPORT NEWS

Vessel	Destination	Tons
Ciampa[8]	Taranto	3,760
Hubert[7]	Brazilian ports	1,928
F. H. G. Dow[9]	Seville	1,556
St. Helena[8]	Spezia	6,400
Westmount[8]	Port of Spain	2,600
Lysefjord[5]	Cienfuegos	950
Vernon[8]	Santiago de Cuba	1,000
Monkstone[7]	Montevideo	4,100
Berwindvale[8]	Havana	8,300

PHILADELPHIA

Vessel	Destination	Tons
E. Randall	Fjardo	
Progress III	Puerto Padre	
Harry Morse	New Orleans	
Richardson[10]	Braintree	
Maple Hill[10]	Salem	
Logan	Portsmouth	
Cleona	Boston	
Thomaston	Somerville	
Neshaminy	Brookline	
Moselem	Providence	
Tulpehocken	Winthrop	
Paxtang	Boston	
Tabor	Portsmouth	
Ashland	Portland	
Tohickon	Newburyport	
Frances Hyde	Manzanillo	809
Ulrik Holm	Puerto Barrios	2,200
William Booth	Calais	435
W. H. Summer	Cuba	489
M. P. Smith	Cay Francis	528
Anna	St. John, N. B.	747
Cumru[10]	Portland	
Ontelaunee	Milton	
Macungie	Lynn	
Franklin	Salem	
Bethayres	Newburyport	
Pennypack	Boston	

BALTIMORE

Vessel	Destination	Tons
B. Barrett	Cuba	2,977
Rocio	Argentina	5,058
Unbi Mendi	Italy	5,563
San Giuseppi	Italy	1,68[illegible]
Byglana	Cuba	3,377
Hoglana	Sweden	5,906
Kanawha	Cuba	3,000

[1] W. C. Atwater. [2] Pocahontas Fuel Co. [3] Flat Top Fuel Co. [4] Hasler Bros. [5] Smokeless Fuel Co. [6] Castner C. & B. [7] C. & Ohio Coal & Coke Co. [8] Berwind White. [9] C. G. Blake. [10] Phila. & Reading Coal & Iron Co.

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	To	Tons	Rate
P. W. Sprague	Manzanillo	709	3.75
M. P. Smith	Cay Francis	528	
Trym	Cienfuegos	1,138	
Daleby	Queenstown	2,353	
Helvetia	Jacksonville	800	1.10
Augusta	Camden	875	1.00
U. Holm	Port Barrios	930	
Brampton	Italy		
Fairfield	Charleston	478	1.10

BALTIMORE

Vessel	To	Tons	Rate
Alf	Bocas	1,378	
S. Giuseppe	Italy		

VIRGINIA

Vessel	To	Tons	Rate
L. V. Stoddard	Norfolk	1,616	
E.W.Murdock	Canary Is.	1,215	
Marguerite	St. John	1,475	

ATLANTIC RANGE

Vessel	To	Tons	Rate
Muskegon	Port Militar	2,129	

OCEAN FREIGHTS

A large number of steamers for export coal were chartered during the past week. The last charters for grain to Italian ports were at $15.84 and shippers are endeavoring to secure concessions in this rate, but thus far without success. There have been no charters for Italian coal since our last report, as shippers are not inclined to meet owners' views. Coal rates to Brazil and to the Plate are very firm, and it is reported that a steamer has been chartered to load coal at Virginia for Rio at $9.60, though there are steamers willing to accept a lower figure. We understand that some remarkably high rates have been paid from Cardiff to the Plate. West Indian freights are firm and advancing.

Coal freights are quotable as follows:

To	Rate	To	Rate
Havana	$2.50@3.00	Bermuda	$3.00@ 3.25
Cardenas or Sagua	2.75@3.25	Vera Cruz	5.50
Cienfuegos	3.00@3.50	Tampico	6.50
Port au Spain, Trinidad	3.75@4.00	Rio	8.64@ 9.12
St. Lucia	3.50@3.75	Santos	8.64@ 9.12
St. Thomas	3.25@3.50	Montevideo	8.64@ 9.60
Barbados	3.75@4.00	Buenos Aires or La Plata	8.88@ 9.60
Kingston	3.00@3.25	Rosario	9.12@10.08
Curacao	3.25@3.50	West Coast of Italy	13.20@14.40
Santiago	3.25@3.50	Barcelona	11.52@13.20
Guantanamo	3.25@3.50	Valparaiso or Callao	7.50
Demerara	6.00@6.50	Marseilles	12.00@13.20

* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British steamers; neutral steamers are more difficult to obtain and the rates are always higher.

W. W. Battie & Co.'s Coal Trade Freight Report.

LAKE MARKETS

PITTSBURGH

Demand improved on the whole, with iron and steel industry taking record tonnage. Operations 60 to 70% of capacity. Car shortages more pronounced. Prices slightly stiffer.

There is an improved line demand, with the steel industry taking still larger tonnages than formerly, and easily making a new high record rate for coal consumption. The railroads are all busy and are consuming more coal, and are also stocking a little. Domestic demand remains relatively light but is approximately normal for the season.

Car shortages have developed on additional lines and in some cases are rather serious. Cars in themselves are not plentiful and with some apparent shortages in motive power the movement is not good. The general expectation is that there will be a severe car shortage before the close of Lake navigation. Shipments in the Lake trade continue moderate. Coal cargoes are not being eagerly solicited, as strenuous efforts are now being made to move every ton of ore possible down the Lakes before the close of navigation and many boats are going up light.

Mine operations in the Pittsburgh district continue at between 60 and 70% of capacity, probably somewhat nearer the higher figure. Prices for free coal have stiffened slightly, and while the former minima can sometimes be done, advances of 5c. are not uncommonly paid. Youghiogheny gas slack is in particular demand, at fully 60c. We quote free coal: Slack, 50@60c.; nut and slack, 90c.@$1; nut, $1@1.05; mine-run, $1.05@1.10; ¾-in., $1.15@1.20; 1¼-in., $1.25; on contract to Apr. 1: slack, 85@95c.; mine-run, $1.15; ¾-in., $1.25; 1¼-in., $1.35, per net ton at mine, Pittsburgh district.

TORONTO

Coal moving more freely and there are indications of a turn for the better.

Coal has been moving more freely with the setting in of cooler weather, and the industrial outlook is showing some indications of improvement. Yards are kept well stocked against a possible shortage and dealers are advising consumers to lay in good supplies in advance, though so far comparatively few are doing so. Transportation is somewhat delayed by a shortage in cars. Steel hopper cars are about 25% short of the demand, while the gondola flat cars are unobtainable. Higher prices on all grades of soft coal are anticipated and a local advance in wholesale bituminous rates has been made.

Quotations per short ton for best grades are as follows: Retail, anthracite egg, stove and nut, $7.75; grate, $7.50; pea, $6.50. Bituminous, retail steam, $5.25; screenings, $4.25 to $4.50; domestic lump, $6; cannel, $8. Wholesale, f.o.b. cars at destination, three-quarter lump, $3.79; screenings, $3.

BUFFALO

Steady improvement in bituminous, though the rush is confined chiefly to the Pittsburgh market. Buffalo is handicapped by the slow Canadian demand. Anthracite moving faster.

Bituminous—This market feels the general stir of business, but it is not able to come up to the level of Pittsburgh, from which some very extravagant reports are coming at present. Buffalo depends largely on the Canadian trade, which is still light and does not promise to improve much right away. The car situation is getting worse; shippers are receiving notices that they will not be furnished with more than 75% supply. The mines are also warned to send out loaded cars promptly; if any are found loaded they are now counted as part of the allotment of the day.

While the shippers still report the bituminous market as somewhat unsteady it is agreed that it improves every week. Quotations are more firm than formerly and somewhat higher on some sizes as follows:

	Pittsburgh	Allegheny Valley	Penn. Smokeless
Lump	$2.65	$2.45	$2.55
Three-quarter	2.55	2.30	....
Mine-run	2.45	2.20	2.30
Slack	2.15	2.05	2.30

These quotations are f.o.b., Buffalo freight rates, and are for short tons to all points except east of Rochester, N. Y., and Kingston, Ont., where the long ton basis prevails.

Anthracite—There is some stir in this market, but the consumer is not at all anxious for coal yet. Favorable reports come in from the Western trade, which is waking up to the fact that winter will soon be here. The shippers to Lake Michigan will soon find that they must pay higher Lake freights if they are to get much tonnage. All the vessels now want to go to Lake Superior after the 6c. wheat freights. Even small steamers are refusing coal and going light for wheat.

The local trade has not started up much yet. The anthracite mines show increased activity. The stocking of surplus is not very general. All sellers of independent anthracite report that trade is picking up and prices are fully up to circular. Bituminous jobbers in this branch of the business are active and appear to be pushing sales in a way that the agents and salesmen of the large companies are not.

Prices of anthracite at Buffalo are per long ton, $5.60 for grate, $5.85 for egg and stove, $6.10 for chestnut and $4.30 for pea, all f.o.b. For delivery to vessels an addition of 25c. per ton is made. Prices include the Pennsylvania state tax.

COLUMBUS

Improvement in the domestic trade. Prices well maintained and some talk of an advance.

Dealers are buying better since weather conditions have improved and more orders are now released. There is a generally better tone to the market and it is believed that the worst of the depression is over.

Retailers' stocks are not large and since they are having a good demand from consumers they are compelled to replenish their stocks. Most of the orders booked at this time are for immediate shipment. A number of the producers and jobbers have instructed their salesmen not to book orders at present prices beyond Oct. 15. In case an advance is made it will be on an average of 10c. on the ton.

There is a better market for the small sizes. Nut, pea and slack is especially strong and prices are advancing. In retail circles there is a good demand for the fancy grades, such as Pocahontas and West Virginia varieties. Hocking lump is now being stocked to a larger extent than formerly. Considerable attention is being given to school, public institution and municipal contracts. A number of Ohio institutions have announced that nothing but Ohio-mined coal would be bought.

Lake trade is rather quiet, although there is a fair tonnage being shipped, though a part of this is from West Virginia mines.

Steam business is strong in every department. Manufacturing is still on the upturn and as a result fuel requirements are increasing. Railroads are still storing an immense quantity of coal for the winter. Car shortage is growing more pronounced in many sections, especially on the Chesapeake & Ohio R.R. and is extending to other roads.

Prices in Ohio fields per short ton, f.o.b. mines, are as follows:

	Hocking	Pomeroy	Eastern Ohio	Kanawha
Re-screened lump	$1.50	$1.60		
Inch and a quarter	1.40	1.45	$1.30	$1.30
Three-quarter inch	1.25	1.35		1.25
Nut	1.15	1.25		1.15
Mine-run	1.05	1.10	1.00	1.05
Nut, pea and slack	.65	.65	.50	.55
Coarse slack	.55	.55	.40	.45

Mines have been working at about the following precentages of full capacity:

	Week Ended			
District	Sept. 18	Sept. 25	Oct. 2	Oct. 9
Hocking	45	50	50	50
Jackson	25	25	25	30
Pomeroy	60	75	80	75
Crooksville	40	40	40	45

	Week Ended			
District	Sept. 18	Sept. 25	Oct. 2	Oct. 9
Cambridge	45	45	45	50
Massillon	45	45	45	55
Eastern O.	70	75	80	80
Average	47	50	52	55

CLEVELAND

Cooler weather braces domestic trade, but jobbing business remains unchanged. Scarcity of vessel tonnage.

Receipts were fair over Sunday, but there was no inquiry for coal. Jobbers held the prices because they cannot otherwise come out whole, but sales were made with an effort. Cold weather the last week has given the domestic trade an impetus. So much of the domestic business is hand to mouth, especially this year, that the weather has an unusual effect upon it.

The lake situation does not change. Some of the shippers are having trouble getting boats and have notified some of the vessel owners they must live up to contracts or vessels will be chartered in the open market to their accounts. This is rather extreme, but such a threat seems to be necessary to make some managers realize they have coal to carry. Freight rates higher than the contract rates of last spring have been paid to smaller ports. The larger shippers will not pay anything extra until the last two weeks of the season.

Jobbers are being quoted at the following prices, f.o.b. Cleveland per short ton:

	Pocahontas	Youghiogheny	Fairmont	Bergholz	Ohio No. 8
Freight rate	$1.45	$1.00	$1.15	$0.70	$0.90
Lump	3.70				
Lump, 6-in.				2.30	
Lump, 1¼-in.		2.40		2.10	2.15
Lump, ¾-in.		2.30	2.05	2.00	1.95
Egg	3.70				
Egg, 6-in				1.90	
Mine run	2.80	2.15	1.95	1.85@1.90	1.85
Slack		1.75@1.80	1.85	1.65	1.70

DETROIT

Greater regularity develops in steam trade. Cold weather strengthens market for domestic coal. Lake movement of small volume.

Bituminous—Small sized orders and more renewals give an encouraging aspect to the steam trade. While the total amount of business is less than normal for this period a gradual improvement is expected from now on. Consignment coal is still plentiful but forced sales has greatly diminished and cheap offerings are few. Weather conditions are creating a greater demand for domestic coal. Retail yards seem to have considerable of a supply on hand, but renewal orders are expected soon.

Anthracite—Distribution of anthracite to consumers is making good headway, some retail yards finding it necessary to put additional men and teams at work. Though somewhat delayed, the outlook is for normal sales. Some difficulties and delays are reported in transportation.

Lake Trade—Attractive freight rates on grain and iron ore leaves few Lake freighters available for handling coal. From the present outlook, much coal will have to be shipped all rail into the Northwest.

TOLEDO

Car problem more serious. Lake movement continues light.

The traffic situation is commencing to look more serious than a few weeks ago and the local trade is finding it more difficult to secure quick shipments. Indications are that this tightening will be more and more noticeable as the grain shipments increase. The Lake movement is light although quite a bit of coal is coming into the Toledo docks. The domestic trade has been strengthened recently by the cold weather.

Quotations here, f.o.b. mine, per short ton, are:

	Pocahontas	West Virginia	Hocking	Pomeroy	Jackson	Massilon	Kentucky	Pittsburgh No. 8
Lump	$2.25	$1.40@1.85	$1.60	$1.65	$2.50	$2.50	$1.75	$1.25
Egg	2.25	1.00@1.25	....	....	....	....	1.25	1.20
Mine-run	1.40	.85@1.00	1.10	1.10	2.50	....	.90@1.10	1.00
Nut	....	.90@1.15	1.25	1.25	....	2.50	.90@1.15	.....
Nut, pea and slack	....	....	.65	.65	.60	....	.40@ .60	.60@.75

CINCINNATI

Colder weather has stimulated the market and both orders and inquiries are more numerous. Shortest car supply of the season is hampering deliveries.

A touch of winter with a trace of snow, helped to bring all classes of consumers of coal to a realization that fuel will soon be required, and the retail trade promises to be livelier from now on. The steam trade is still lagging somewhat, due to relative inactivity in many manufacturing lines rather than to disinclination to buy. Larger industrial consumers have contracted for their requirements, and while deliveries have been held off, indications are that they will be required from now on in normal quantities.

The chief trouble with operators just now is in the short car supply, conditions on one or two lines last week being the worst of the season. Cars were almost entirely lacking, and coming at a time when orders are picking up for the first time in a seasonable fashion, the shortage was especially irritating. Prices as a rule are firm, although there is some cheap coal being offered here and there.

LOUISVILLE

Car shortage limiting outputs and retailers beginning to consider their stocks.

Retail dealers, as a rule, have not been buying as much as usual. The car shortage is limiting the outputs of most of the mines and the thoughtful retailers are taking this into consideration. The movement generally has been somewhat better during the past week and prospects are good.

Prices per long ton basis, f.o.b. mines, are around $1.75 for Eastern Kentucky block and $1.15 for the Western Kentucky lump; nut and slack in Eastern Kentuckies sell at from 50 to 65c. for the best grades, with the lower grades on almost a level with Western Kentucky pea and slack, on which the buyers are about making their own prices.

COKE

CONNELLSVILLE

Furnace coke contracting movement continues, with 125,000 tons monthly closed thus far. Slightly lower prices for year than for half-year. Spot coke stiffer. Production and shipments slightly increased.

Additional contracts for furnace coke for 1916 have been closed. Typical transactions are 10,000 tons a month over 1916 at a sliding scale, with 20% as much advance in coke as in basic pig iron, valley, making coke $2.15 at the present market of $15, $2.35 on $16 pig iron and so on, and a contract for about 18,000 tons a month over 1916 at a flat price of about $2.25. Coke contracts placed thus far in this movement, covering four or five weeks, total about 125,000 tons a month, partly for the first-half and partly for the whole year. Sliding scale contracts are made on the same basis whether for the long or short period, while in the case of flat prices slightly lower figures are quoted for the whole year than the half-year. Operators are doubtful whether the coke market will be as strong in the second-half as the first-half as so many byproduct ovens are to be completed by next June, and thus the disposition is to quote a shade lower for the longer delivery.

Prompt furnace coke has advanced again. There were no sales last week to speak of, with practically no offerings and no urgent inquiry. This week opened with quotations higher on the strength of there being no accumulations, rather than on the basis of heavier demand. Foundry coke demand is moderate. We now quote: Furnace coke, prompt, $1.85@1.90; November and December, $2; first-half, $2.35@2.50; year 1916, $2.25@2.35; prompt foundry, $2.30@2.60; contract foundry, $2.40@2.60, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Oct. 2 at 397,589 tons, an increase of 8,705 tons, and shipments at 395,243 tons, an increase of 8,225 tons.

Buffalo—There is an effort on the part of producers to make a sharp advance in the price of coke and quite a large part of them have withdrawn all quotations, after asking about $4.40 for foundry. Jobbers are doubtful about it and are not inclined to pay the advance, maintaining that $4.40 is sufficient for best Connellsville 72-hr. foundry, with stock coke $3.45.

Chicago—The Chicago coke market continues to harden. Connellsville quotations are higher. The demand for byproduct foundry has been very strong, and a better tone is seen in gas-house. Increased orders have been received for byproduct domestic sizes. Prices f.o.b. cars Chicago per net ton of 2,000 lb. are as follows: Byproduct foundry, $4.90@5.10; byproduct domestic, $4.85@4.95; Connellsville, $4.85@5; Wise County, $4.85@5; gas coke, $3.90@4.

MIDDLE WESTERN

GENERAL REVIEW

Chilly weather makes improvement more marked. Domestic business snappy. Steam coals stronger. Anthracite demand expanding.

The past week has been characterized by a steady and broadening demand in all branches of trade. With temperatures below normal for this time of year, the close of last week has seen a real snap to domestic business and more active buying at firm prices. Wholesalers report orders increasing day by day, and are very cheerful over the outlook. The forward movement in retail buying has been conspicuous, and is welcomed by local yards. A number of operators report unfilled orders on hand for domestic coals and certain other sizes, which augers well for the future now that chilly weather has appeared.

Increased demand has led to some stiffening of prices, particularly Indiana and Springfield domestic sizes; No. 2 Franklin County nut is being sold at higher figures and Southern Illinois No. 1 washed is in strong demand at firm prices. The advance in freight rates on some Western coals has slowed up orders slightly, but no particularly harmful effects have been noticed as yet. Screenings occupy about the same position as last week. A considerable volume of coal is still moving to Northwestern points notwithstanding the rate advances. Rush orders have been received from many interior points owing to frosty weather. The price situation is generally strong, and in this respect Eastern coals have benefited greatly.

CHICAGO

Domestic trade very strong. More operations resuming production. Car shortage developing a scarcity of Eastern coals. Railroads continue heavy buyers. Anthracite picking up rapidly.

Franklin and Williamson County coals remain stationary in price, but it is expected that an advance will occur about the middle of the month. Egg is moving better and steam sizes are held up remarkably well. Lump and No. 1 nut are held firmly at $1.75, and screenings are slightly stronger, averaging about 55c. The mines are averaging from four to five days per week in running time.

The domestic demand for Springfield coal has improved considerably, and orders during the last week have been in large volume; $1.75 is the ruling figure for domestic lump. Screenings are showing more activity at higher prices, and average 50c.

A heavier demand for Indiana domestic coal this week has been a prominent feature. Steam coals are not so strong but are improving; screenings, however, are well maintained in price. Operators are preparing for a month of great activity, and are making special efforts to keep retailers fully supplied. Some of the larger Indiana mines which have not yet resumed operations are expected to begin hoisting coal very shortly. No. 4 screenings are selling around 70c. a ton, with Nos. 5 and 6 about 10c. lower; retailers generally have advanced the price of all domestic coals 25c. per ton.

Pennsylvania smokeless shipments are light because of car shortages. The colder weather has created active distribution of smokeless coals while the dealers' supplies are beginning to melt away, and their orders have been more frequent and urgent; there is no free coal here at the present time. The situation in smokeless is more satisfactory than for several weeks past; prices are stiffer and very little lump and egg is being sold under $2.10. Prices are stronger for splint; the better grades are selling at $1.50, and high grade nut and slack has gone into northern Indiana at from 60c. to 65c. Manufacturing is gradually becoming stronger, and the splint operators think that fine coal will be at a much higher level within a short time.

The Hocking circular will probably advance shortly because of the firm domestic demand and active buying for stocking purposes. Hocking lump is being stocked heavily and railroads are continuing to absorb storage coal. Some dealers complain that there is little Hocking coal of better quality available.

The Kentucky situation has bettered with stronger prices for all grades except steam sizes, which are still comparatively slow. Railroads are reported to be taking maximum tonnages from Kentucky mines.

Retail dealers are making more progress with anthracite deliveries, and there is lately a better tone generally in this branch. It is felt that the reports of reduced production at the mines has had some effect in stimulating orders. Prices are about at the same level of last week.

Quotations in the Chicago market are as follows:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump	$1.75	$1.65@1.75	$1.50@1.70	$1.60@1.75	$1.40@1.60
Steam lump	....	1.25@1.30	1.20@1.30	1.15@1.25	1.25
2½ and 3-in. lump	....	....	1.40@1.50	....	1.30@1.40
1¼-in. lump	....	....	1.25@1.30	1.15@1.25	....
Egg	1.65@1.75	1.50@1.60	1.10@1.20	1.20@1.35	1.15@1.25
Nut	....	1.65	.95@1.05	1.15@1.25	1.00@1.05
No. 1 washed	1.75	....	1.50@1.60	....	....
No. 2 washed	1.40@1.50	....	1.40	....	....
No. 1 nut	1.75	....	....	....	....
No. 2 nut	1.65@1.75	....	....	....	....
Mine-run	1.10@1.25	1.05@1.15	.85@.95	.95@1.05	.90@1.05
Screenings	.50@.65	.40@.50	.40@.50	.55@.65	.75@.80

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.60@1.75	$1.75@2.25	$2.00@2.25	$1.75@1.85	$1.50@1.75
1¼-in. lump	1.25@1.30	....	....	1.25@1.40	1.40@1.50
Egg	1.60@1.75	1.25@1.75	2.00@2.25	1.75@1.85	1.05@1.10
Nut	1.40@1.50	1.10@1.35	....	....	....
No. 1 nut	1.60@1.75	....	....	....	....
No. 2 nut	1.50	....	....	....	....
Mine-run	1.10@1.25	....	1.40	1.25@1.40	1.10@1.15
Screenings	.50@.65	.40@.70	....	....	.50@.70

West Virginia splint, 3-in. lump, 1.35@1.50; 1¼-in. lump, $1.15@1.25.

DULUTH

Shipments out the heaviest of any week this season. Receipts light, some docks receiving no cargoes. Anthracite normal.

The past week has seen the heaviest shipments made by dock companies so far this season. The weather has been wet and cold, so that the retailers witnessed a real spurt and the wholesalers have kept everything moving, in order to take care of the requirements of the domestic trade. Shipments for the railroads are off a little, the wet weather having interfered with the grain movement, shipments of which are reported somewhat delayed. Receipts continue light, a number of the docks not having received a cargo during the past week. No change in prices has been announced since last week and the circular appears to be fairly well maintained, although in a number of instances reports are current that quotations have been made at a little below circular.

Quotations per short ton, f.o.b. cars Duluth, are as follows:

	Yough.	Splint	Hock.	Smokeless	Elkhorn
Lump	$3.40	$3.40	$3.40	$4.75	$3.75
Dock-run	3.10	3.10	3.05	3.25	3.25
Stove or nut	3.40	3.40	3.40	4.75	3.65
Screenings	2.40	2.40	2.25	2.75	2.40

The demand for anthracite for domestic purposes is very good and the shipments continue up to the average of other years. Many householders are now putting in their supply of fuel for the winter and the retail business in this class of trade is quite brisk. Prices f.o.b. cars, docks, per short ton, are as follows: Egg and stove, $6.85; nut, $7.10; pea, $5.55, and buckwheat, $4.

INDIANAPOLIS

Business fairly lively, with better prices for domestic lump and screenings. Retailers busy and have advanced prices. Railroads buying more.

Indiana coal mines are now going at a seasonable pace and the demand for domestic lump is urgent enough to stiffen the price, with sales at $1.50 for 2½-in. and $1.60 for 4-in., both No. 4. The price of screenings has also improved and operators are getting 60 to 65c. f.o.b. mines. Mine-run is selling at $1.15 to $1.20. The mines have just managed to get enough cars to keep coal going to the retailers, who are just now doing a rushing business.

The railroads are also doing better buying and seem to be laying by coal, as far as the supply of cars will permit. The industrial demand continues its slow but gradual improvement. Not all the mines of the state are in operation but the indications are that that condition will exist in November. Retailers have made the second advance in prices this season raising them 25c. on Indiana and Pocahontas coals. The new schedule is:

Linton No. 4 forked	$3.25	Pocahontas forked lump	$6.00
Indiana lump forked	3.00	Pocahontas shoveled lump	5.50
Indiana lump and egg, screened	2.75	Pocahontas mine run	4.50
Kanawha lump, forked	4.25	Pocahontas, nut and slack	3.75
Ohio Hocking, lump	4.25	Anthracite, chestnut	8.25
Ohio Hocking, wash egg	4.50	Anthracite, stove and egg	8.00
Kentucky lump	4.50	Anthracite, grate	7.75
Ohio Jackson lump, forked	5.00	Connellsville coke	6.00
Blossburg smithing	5.50	Indianapolis by-product coke (all sizes)	6.00
Cannel lump	6.00		

ST. LOUIS

Market strengthens up under stimulus of colder weather. Generally good demand and prices up slightly.

The week opened quietly, but the movement was stimulated the latter part by a change in the weather and the market strengthened up considerably. There was a good demand for all sizes except screenings. There was an advance of 5c. on inner group lump grades and on outer group prices there was only a minor change. Screenings were stationary. Country orders for standard grades improved. Still greater improvement in the demand for domestic sizes is expected. There is practically no change in the steam situation.

Quotations f.o.b. mines during the past week have ranged on the following basis per short ton:

	Frk. Co.	Wmsn. Co.	Staunton	Standard
6-in. lump	$1.50@1.75	$1.50@1.75	$1.25@1.35	$1.20
2-in. lump	......	......	1.15@1.20	1.05
3x6 egg	1.35@1.75	1.35@1.65	......	1.00
2x6 egg	......	......	......	.85
No. 1 nut	1.50@1.75	1.50@1.75	......	.80
No. 2 nut	1.40@1.50	1.40@1.50	......	.55
No. 1 washed	......	1.65	1.50	....
No. 2 washed	......	1.25	1.10@1.25	....
No. 3 washed	......	1.25	1.10@1.25	....
No. 4 washed	......	1.20	1.05	
No. 5 washed	......	.60@70	.50@60	.....
Screenings	.40@50	.40@50	.35@40	.25

KANSAS CITY

Prices increased. Shipments delayed. Readjustments of freight rates causing some confusion. Outlook encouraging.

Retail prices were increased 25c. a ton on Oct. 1. The rise was somewhat unexpected, though it was generally anticipated that by Nov. 1 prices would be increased 25c. Wholesale prices have advanced irregularly on different kinds, from 10c. to 25c. a ton, some grades not being affected. Wholesale dealers report the demand good and the supply still seriously retarded on account of the recent heavy rains. Railroads are short of cars. On interstate shipments, freight rates are up 10c. and there is some confusion as to what constitutes interstate shipments so that dealers have to refer all freight questions to their traffic departments. Coal men generally are beginning to congratulate themselves on what looks like the beginning of a favorable season.

Ruling prices, per short ton, f.o.b. mines, with freight rate to Kansas City, are:

		Freight			Freight
Cherokee lump	$2.25	$0.90	Farmer's Block (Red Label)	$2.65	$0.60
Cherokee mine run	1.85	.90	Morning Glory (Higginsville)	2.35	.60
Cherokee nut	2.00	.80	Arkansas Semi-Anthracite	3.00	2.10
Cherokee mill	1.60	.75	Arkansas Anthracite sizes	4.10	2.20
Cherokee slack	1.40	.75	Arkansas Anthracite lump	3.85	2.20
Lexington block	2.10	.40	Pennsylvania Anthracite chestnut	7.10	2.60
Parlor block	2.10-2.25	.40	Pennsylvania egg	6.85	2.60
Richmond	2.10	.40	Pennsylvania grate	6.60	2.60
Waverly lump	2.10	.40			
Waverly nut	2.10	.40			
Novinger No. 1 lump	2.10	.60			
Novinger Co. C	2.00	.60			
Novinger nut	1.85	.60			

PRODUCTION AND TRANSPORTATION STATISTICS

ANTHRACITE SHIPMENTS

Anthracite shipments for September and the first nine months of 1914-15 were as follows:

	September		9 Months	
	1915	1914	1915	1914
Phila. & Reading	895,718	1,101,296	7,995,805	8,869,552
Lehigh Valley	1,093,283	1,290,327	9,447,463	9,550,799
Cent. R.R. of N.J	626,237	824,604	5,636,799	6,560,049
Del. Lack. & West	820,440	893,098	6,791,191	7,138,223
Del. & Hudson	737,592	647,974	5,970,324	5,354,593
Pennsylvania	467,587	575,898	4,233,909	4,697,325
Erie	718,751	727,950	5,816,660	6,169,528
Ont. & Western	159,163	185,045	1,486,960	1,727,512
	5,518,771	6,246,192	47,379,111	50,067,581

Stocks at Tidewater Sept. 31 were 633,338 tons.

SOUTHWESTERN TONNAGE

The following is a comparative statement of the Southwestern tonnage for May and the preceding three months:

	April		May		June	
State	1914	1915	1914	1915	1914	1915
Missouri	179,723	196,032	165,394	161 575	185,731	166,885
Kansas	378,192	410,565	370 097	354,264	490,561	449,803
Arkansas	87,002	80,118	95,749	71,023	133,350	71,498
Oklahoma	239,443	181,873	241 80	173,821	273,692	201,126
Totals	884,360	868,588	872,421	760,683	1,083,334	889,312

SAULT STE. MARIE CANALS

Anthracite shipments through St. Marie canals in September were: 174,560 short tons of anthracite which is 11,650 tons more than in the same month last year but 126,973 tons less than in September, 1913. Bituminous shipments were 1,553,426 short tons which is 210,166 tons less than during the same month a year ago and 1,503,920 tons less than in September, 1913.

NORFOLK & WESTERN RY.

The following is a statement of coal handled by the N. & W. Ry. during August and the past four months in short tons:

	May	June	July	August
Pocahontas Field	1,259,992	1,493,776	1,648,551	1,721,573
Tug River District	322,881	348,737	361,454	337,585
Thacker District	278,775	238,688	265,743	227,312
Kenova District	90,642	81,794	80,009	80,152
Clinch Valley District	144,576	155,689	146,911	151,804
Other N. & W. Territory	2,323	3,418	2,651	4,239
Total N. & W. Fields	2,099,189	2,322,102	2,505,319	2,522,665
Williamson & Pond Creek	84,086	75,573	86,949	89,785
All other railroads	251,339	282,790	262,177	348,124
Grand total	2,434,614	2,680,465	2,854,445	3,005,618

Distribution of shipments for June and July follow:

	June			July		
	Shipped	Tipple	Total	Shipped	Tipple	Total
N. & W. Fields	1,375,303	11,153	1,386,456	1,519,769	12,233	1,532,002
Pocahontas	1,375,303	11,153	1,386,456	361,454	2,347	363,801
Tug River	348,737	2,370	351,107	234,568	6,960	241,528
Thacker	209,216	6,713	215,929	80,009	8,076	88,085
Kenova	81,794	8,643	90,437	80,009	8,076	88,085
Total	2,015,050	28,879	2,043,929	2,195,800	29,616	2,225,416

Shipments of coke entirely from the Pocahontas field amounted to 58,507 tons in July and 66,095 in June.

THE CAR SITUATION

The American Railway Association reports a surplus of 16,563 coal and gondola cars and a shortage of 3,251 on Oct. 1. There was a decrease in the shortage of coal cars in the Eastern group. The gross surplus of all kinds of cars on Oct. 1 was 88,061, which compares with 191,309 on Sept. 1, and 133,382 on Oct. 1 of last year. The gross shortage of all kinds of equipment on the first of the current month was 9,762, as compared with 6,300 on Sept. 1, and 2,355 on Oct. 1 of last year.

BALTIMORE & OHIO

The following is a statement of coal and coke tonnage moved over this system and affiliated lines during August and the previous two months:

	June		July		August	
	1915	1914	1915	1914	1915	1914
Coal	2,883,959	2,380,795	2,887,918	2,594,407	3,009,028	2,769,45
Coke	329,130	298,237	344,557	255,650	345,258	242,28
Total	3,213,089	2,679,023	3,232,475	2,850,057	3,354,286	3,011,73

CHICAGO LAKE ARRIVALS

Lake shipments to Chicago for September and the season to date this year and last year were as follows:

	1915		1914	
From	Hard	Soft	Hard	Soft
Buffalo	90,364	24,281	84,160	x
Oswego	22,488	x	20,558	x
Toledo	x	30,749	x	40,778
Cleveland	x	53,730	x	8,132
Erie	11,326	x	x	x
Sandusky	x	8,500	x	19,428
Ashtabula	x	8,167	x	14,665
Lorraine	x	9,500	x	x
Conneaut	x	9,050	x	x
Fairport	x	7,932	x	x
Month's total	124,178	149,909	104,718	83,003
Season's total	596,644	520,465	532,377	534,208

FOREIGN MARKETS

GREAT BRITAIN

Oct. 1—Tonnage conditions are worse than ever from the exporters' point of view as the result of the withdrawal of Greek tonnage. Stocks are now excessive and colliery owners are offering supplies on very cheap terms for early delivery. Quotations are nominally as follow:

Best Welsh steam	Nominal	Best Monmouthshires	$4.80
Best seconds	Nominal	Seconds	4.32
Seconds	$4.80	Best Cardiff smalls	3.36
Best dry coals	5.76	Cargo smalls	2.16

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—Chartering is very restricted and rates continue their upward course. For Islands and South America there is no business passing at present. Rates are nominally as follows:

Gibraltar	$6.00	Naples	$9.60	St. Vincent	$5.28
Marseilles	9.65	Alexandria	10.80	Rio de Janeiro	6.72
Algiers	5.98	Port Said	10.80	Monte Video	6.96
Genoa	9.60	Las Palmas	5.04	Buenos Aires	7.20

Exports—British exports for August and the first eight months of the past three years were as follows:

	August			Eight Months		
To	1913	1914	1915	1913	1914	1915
Russia	769,794	169,353	5,923	3,794,188	3,049,527	35,495
Sweden	379,475	198,347	135,875	2,880,837	2,421,789	1,895,325
Norway	154,887	253,467	269,812	1,513,688	1,673,336	1,872,214
Denmark	248,746	243,019	320,754	1,937,492	1,861,470	2,231,186
Germany	798,177	132,026	......	5,950,248	5,256,765	......
Netherlands	168,862	165,296	212,381	1,389,990	1,181,071	1,154,243
Belgium	148,132	31,727	......	1,382,186	1,039,985	......
France	946,378	562,783	1,542,530	8,526,921	8,471,077	11,537,001
Portugal[1]	95,924	77,729	71,117	929,284	836,009	690,656
Spain[4]	259,847	172,578	162,800	2,474,504	2,231,177	1,396,077
Italy	665,618	444,779	419,310	6,339,031	5,859,577	3,844,360
Aus. Hung.	64,286	17,602	......	742,646	564,362	.....
Greece	36,080	29,353	9,819	431,160	470,484	273,198
Roumania	23,283	14,437	......	119,414	218,218	.....
Turkey	24,787	41,456	3,767	133,453	417,437	10,324
Algeria	116,754	28,647	56,083	885,736	740,894	634,588
Portuguese[5]	13,390	15,013	8,681	171,458	115,462	145,017
Chile	21,039	17,720	2,611	430,437	352,351	38,384
Brazil	111,504	48,983	52,429	1,286,853	907,090	412,331
Uruguay	72,006	39,103	19,124	502,500	461,656	230,238
Argentine	290,741	98,344	130,576	2,458,161	2,209,706	1,156,992
Channel Is.	16,004	11,354	12,998	107,324	107,308	85,620
Gibraltar	29,161	15,544	39,769	239,851	214,759	242,095
Malta	39,292	19,418	9,230	470,112	297,392	108,567
Egypt[2]	196,796	161,645	140,462	2,000,998	2,060,711	944,435
Aden[3]	17.684	......	......	104,748	96,725	105,794
India	10,057	1,646	5	117,005	118,039	18,080
Ceylon	7,037	5,232	......	148,757	205,068	38,730
Miscell'ous.	93,421	54,141	24,416	851,626	817,716	421,229
Coke	113,423	68,498	89,574	712,698	694,061	576,218
Briquettes	140,278	70,159	113,748	1,363,324	1,324,937	864,503
Total	6,072,863	3,209,399	3,853,794	50,396,630	46,276,159	30,962,900
Bunker	1,749,847	1,147,437	1,158,729	13,720,560	13,249,027	9,657,927

[1] Includes Azores and Madeira. [2] Including Anglo-Egyptian Sudan. [3] And dependencies. [4] And Canaries. [5] West Africa.

Note—The figures in the above table do not include Admiralty and certain other shipments.

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

✚Indicates contracts regarding which official information has been received.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

No. 918—Kansas City, Mo.—This contract (Vol. 7, p. 1,127, Vol. 8, p. 115), which provides for furnishing the Fire and Water Board with approximately 20,000 tons of coal, was awarded to the Central Coal & Coke Co., but the award was later cancelled by the City Council. The Auditing Committee reported that the bid of the Cherokee Fuel Co. averaged $2.45 per ton, as compared with $2.48 for the Central Co. On two grades the Central Co. was 10c. a ton higher than the Cherokee Co., 9c. higher on one grade, and on the two other grades 10c. lower. Owing to the general dissatisfaction with the results obtained it has been recommended that bids be advertised for again and no grades specified except those used by the city. Address Pur. Agt. C. W. Lovelace, Kansas City Municipal Water and Light Dept., Kansas City, Mo.

1003—Kansas City, Mo.—The purchases on this contract (p. 77), which provides for the fuel requirements of the Wesley Hospital, will be confined to the open market instead of covered by a contract as previously noted. Address Board of Directors, Wesley Hospital, Kansas City, Mo.

1161—Colorado Springs, Colo.—All the bids on this contract (p. 199), which provides for furnishing the local Board of Education with approximately 3,000 tons of mine-run lignite coal, have been rejected. Address Board of Education, D. E. Graff Bldg., Colorado Springs, Colo.

1262.—Des Moines, Iowa—It is reported that this contract (pp. 324, 489), which provides for furnishing the School Board with approximately 8,000 tons of steam coal, will not be negotiated for perhaps two months. The board is taking advantage of the depressed condition of the trade to make their current purchases in the open market. Tests of various coals are being conducted. Address Secy. A. L. Clinite, Bd. of Edu., Des Moines, Iowa.

1438—New Orleans, La.—This contract (p. 490), which provides for furnishing the Interstate Bank & Trust Co. with approximately 200 tons of bituminous coal, will be awarded some time during the current month. Address Pur. Agt. J. W. Billingsley, Interstate Trust & Banking Co., New Orleans, La.

1441—New Orleans, La.—We are informed that purchases on this contract (pp. 490, 616), which provides for furnishing New Orleans Cold Storage & Warehouse Co. with approximately 3500 tons of coal, will be confined to the open market. The old contract expired at the end of September and the company has since been trying out various coals. Address Purchasing Agent, New Orleans Cold Storage & Warehouse Co., Gainnie and Front Streets, New Orleans, La.

1447—New Orleans, La.—This contract (p. 490), which provides for furnishing the Jacob Candy Co. with approximately 400 tons of Pratt lump coal will not be negotiated this year. Address Pres. Mose Jacobs, Jacobs Candy Co., 823 Carondelet St., New Orleans, La.

1450—Detroit, Mich.—This contract (p. 490), which provides for furnishing Wayne County with approximately 2,500 tons of bituminous three-quarter lump coal, will probably be awarded to the P. Koenig Coal Co. of Detroit, at an advance of 10c. per ton on the old contract which this company also had. Bids guaranteeing a B.t.u. value of 14,000 were submitted as follows: P. Koenig Coal Co., Meadbrook nut, $2.80; United Fuel and Supply Co., Richwood nut, Red Jacket mine, Mattewan, W. Va., $3.20; Smithers Creek nut and slack, W. R. Johnson Coal Co., Oakland mine, Smithers, W. Va., $2.65; R. L. Aylward, Island Creek lump, Holden, W. Va., $3.25; Blue Gem, washed pea, Packard, Ky., $2.90; Kentucky nut, pea and slack, Auxner, Ky., $2.70; Island Creek nut, pea and slack, Holden, W. Va., $2.75; anthracite chestnut, Pittston, Penn., $7.50, with stove and egg, $7.25; Parker Bros. Co., Ltd., White Star nut, Merrimac, W. Va., $3.25, anthracite, chestnut, Scranton, $7.25. Address Secy. William Gutman, Bd. of Audrs., Wayne County, Detroit, Mich.

✚1453—Trinidad, Colo.—All the bids on this contract (p. 530), which provides for furnishing the local School Board with approximately 700 tons of mine-run and slack coal, have been rejected, and purchases will probably be confined to the open market. Address Secy. R. S. Gregory, School Bd. Dist. No. 1, Trinidad, Colo.

1474—Salt Lake City, Utah—Bids have been received on this contract (p. 531), which provides for furnishing the University of Utah with approximately 1,500 tons of screened slack coal as follows: C. S. Martin Coal Co., $3.25; Bamberger Coal Co., $3.25; Central Coal and Coke Co., $3.25; Woodruff-Sheets-Morris Coal Co., $3.25; Jeremy Fuel and Grain Co., $3.25; Federal Coal Co., $3.25; Citizens Coal Co., $3.25; Fischer-Kittle Coal Co., $3.25. Most bidders offered to furnish several varieties of coal and the matter has been referred to the technical staff of the University to determine which will be the most economical bid. Address University of Utah, Salt Lake City, Utah.

1515—Saratoga Springs, N. Y.—Bids have been received on this contract (p. 577), which provides for furnishing the City Hall with 200 tons of grate or egg coal as follows: Saratoga Coal Co., egg, $6.90; grate, $6.37. Independence Coal Co., egg, $6.70; grate, $6.50. G. N. Montange & Son, egg, $6.55; grate, $6.30. Address Comr. of Accounts, M. J. Mulqueen, City Hall, Saratoga Springs, N. Y.

✚1516—Philadelphia, Penn.—The lowest bids on this contract (p. 577), which provides for the deficiency requirements to fill out the supply for different city departments during the current year were as follows: Philadelphia & Reading Coal and Iron Co., (pea coal); Belmont Pumping Station, 1,500 tons at $3.48; Queen Lane Filters, 100 tons at $3.85; Emmons Coal Mining Co., pea coal, Belmont Filters, 100 tons at $4.10; buckwheat, Queen Lane Pumping Station, 3,400 tons at $2.68; (buckwheat), Roxborough Auxiliary, 500 tons at $3.09. Rogers-Corr Coal Co. (bituminous), Lardner's Point, 6,400 tons of bituminous at $2.64 f.o.b. houses, or $2.49 alongside; City Hall (buckwheat), $3.74 per ton. All prices given are on a delivered basis except where otherwise noted. Address Dir. Herman Loeb, Dept. of Supplies, Philadelphia, Penn.

New Business

1550—South Fork, Penn.—The local School Board will receive bids during the current month for furnishing and delivering coal to the school buildings as may be required during the ensuing year. Bids are requested on coal f.o.b. the P. R.R. Freight Station, and also for hauling same to the school buildings. Address Secy. John C. Penrod, School Bd., South Fork, Penn.

1551—East St. Louis, Ill.—Swift & Co., packers of this place, will receive bids during the current month for furnishing their annual coal requirements involving three or four carloads of screenings per day. The company has been purchasing in the open market for several months. Address Pur. Agt. H. C. Higgins, Swift & Co., National Stock Yards, Ill.

1552—Larksville, Penn.—The local School Board received bids until Oct. 15 for furnishing anthracite nut and pea coal to the various local school buildings, as may be required during the ensuing year. Address Secy. Thos. Heffernan, Bd. of Edu., Larksville, Penn.

1553—Westfield, Mass.—The Horse Whip Co. at this place usually contracts for their fuel requirements some time during the fall. They require about 30 tons Nov. 1, Jan. 1 and Mar. 1. They use the best grade Sonman coal. Address Treas. C. J. Bradley, Horse Whip Co., Westfield, Mass.

1554—Salem, N. J.—The county government received sealed bids until Oct. 13 for furnishing approximately 200 tons of bituminous coal to the local county buildings. Address Clk. I. C. Smashey, Salem, N. J.

1555—McKees Rocks, Penn.—The Stowe township school district will receive bids until Oct. 30 for furnishing 1¼-in. soft coal during the ensuing year. Address Secy. H. E. Emeigh, 907 Russellwood Ave., McKees Rocks, Penn.

1556—Youngstown, Ohio—The Mahoning County Commissioners will receive bids until 10 a.m., Nov. 1, for furnishing mine-run and three-quarter inch screened coal as may be required at the Court House and Jail during the ensuing year. All bidders will be required to deposit a certified check for $100, guaranteeing the faithful performance of the contract. Address Clk. Frank H. Vogan, Mahoning County Comrs., Youngstown, Ohio.

1557—East St. Louis, Ill.—Morse & Co., packers at this place, who have been confining their purchases to the open market since their contract expired in last April, will contract again about the middle of the current month for their requirements, involving three or four cars of screenings per day. Address Pur. Agt. L. Chakes, Morris & Co., National Stock Yards, Ill.

1558—California, Penn.—The California School Board is negotiating for approximately 2,000 bu. of coal for delivery during the coming season. Address Secy. W. J. Weaver, California School Bd., California, Penn.

1559—Pine City, Minn.—The Pine County Board of Commissioners will receive bids until noon, Oct. 18, for furnishing Pocahontas and Youghiougheny or white ash splint coal, as may be required at the Court House and County Poor Farm during the coming year. Address County Audr. W. H. Hamlin, Pine City, Minn.

1560—Peabody, Mass.—Sealed bids were received by the Overseers of the Poor until 5 p.m., Oct. 13, for furnishing nut and furnace coal for the City Almshouse during the ensuing year. Address Chn. Michael Sherry, Overseer of the Poor, Peabody, Mass.

1561—Le Mars, Iowa—The Plymouth County Board of Supervisors received bids until 1:30 p.m., Oct. 12, for furnishing and delivering coal as may be required by the Court House, Jail and Poor, during the year beginning Oct. 15. Address County Audr. J. M. Hayes, Bd. of Supervisors, Le Mars, Iowa.

1562—Lewistown, Penn.—The Borough Council received bids until 7:30 p.m., Oct. 11, for furnishing and delivering anthracite coal as may be required at the various hose houses and town hall during the coming season. Address Secy. J. Harry Saxton, Lewistown, Penn.

1563—Appleton City, Mo.—The Board of Education at this place is negotiating for approximately 1,500 bu. of coal to be delivered in the bins at the school building. Address Secy., Bd. of Edu., Appleton City, Mo.

1564—Cleveland, Ohio—Bids will be received until noon, Oct. 20, for furnishing coal for the outdoor relief department as may be required during the ensuing year. Specifications may be obtained from W. H. Winans, Dept. of Charities and Correction, 209 City Hall. Address bids to Comr. A. R. Callow, Purchaser of Supplies, 511 City Hall, Cleveland, Ohio.

1565—Adams, Mass.—The Berkshire Cotton Mfg. Co. usually contracts during the current month for their annual requirements of coal involving approximately 25,000 tons of bituminous mine-run. The coal is delivered at the rate of one-third less in summer than in winter, and deliveries are made on Boston and Albany trestles. The company has a storage capacity of 10,000 tons. Address Pres. C. T. Plunkett, Berkshire Cotton Mfg. Co., Adams, Mass.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

No. 614—Titusville, Penn.—This contract (Vol. 7, p. 795, Vol. 8, p. 616), which provides for furnishing the local Board of Education with approximately 2,000 tons of Greensburg stoker coal, has been awarded to **H. B. Edwards Co.**, at $2.65 per ton, delivered in bin at the high school building. Address Chn. F. C. Kirkpatrick, Supply Comr., Titusville, Penn.

1032—Cleveland, Ohio—This contract (pp. 115, 323, 410), which provides for furnishing the local Board of Education with its fuel requirements during the ensuing year, has been awarded as follows: **Cleveland, Pittsburgh Coal Co.**, bituminous lump, $8,370; **The Zettelmeyer Coal Co.**, semibituminous lump, $15,600; **Cuyahoga Coal Co.**, semibituminous mine-run, bituminous nut and slack, $72,370. Address Dir. of Schools F. C. Hogan, School Headquarters, Rockwell Ave. and East 6th St., Cleveland, Ohio.

1107—Kansas City, Mo.—This contract (pp. 157, 576), which provides for furnishing the Densmore Hotel with approximately 300 tons of slack coal, was awarded to the **Kansas City Coal Co.** Address Purchasing Agent, Densmore Hotel, 912 Locust St., Kansas City, Mo.

1199—Chattanooga, Tenn.—This contract (pp. 244, 491), which provides for furnishing the local city government with approximately 1,800 tons of coal, was erroneously noted as having been awarded to Church & Co. The award was made at $2.20 per ton, the successful bidders being as follows: **Hibler-Barnes Co.**, Brushy Mountain screened run-of-mine coal, 800 tons; **Enterprise Coal Co.**, Fentress coal, 600 tons; **Whiteside Coal Co.**, Wilder coal, 400 tons. Address Comr. E. D. Harris, Dept. of Pub. Utilities, Grounds and Bldgs., Chattanooga, Tenn.

1257—Hay Springs, Neb.—This contract (p. 324), which provides for furnishing the Board of Education School District No. 3 with coal as may be required during the coming school year, has been awarded to **Henry & Richmond**, at $4.75 per ton. Address Secy. N. L. Parsons, Bd. of Edu., Hastings, Neb.

1321—Plymouth, Ind.—This contract (pp. 367, 530), which provides for furnishing Marshall County with approximately 280 tons of Pocahontas coal has been awarded to the **West Virginia Pocahontas Coal Corporation** of Detroit, Mich., at $1.55 per ton, f.o.b. cars. Address County Audr. G. F. McCoy, Plymouth, Ind.

1344—Irene, S. D.—This contract (p. 411), which provides for furnishing the County Court House and jail with coal up to and including April of next year, has been awarded to **Fred Donaldson Co.**, of Yankton, S. D., at $6.60 per short ton. The Loonan Lumber Co. bid $6.60 and Fred Borge $6.80 per ton. Address County Audr. W. O. Nelson, Bd. of County Comrs., Irene, S. D.

1345—Rich Hill, Mo.—This contract (p. 411), which provides for furnishing the local Board of Education with approximately 4,000 bu. of coal to be delivered in the bins of the various school buildings, has been awarded to the **McComb Coal Co.**, at $2.35 per ton. Address Secy. L. C. Stonebreaker, Bd. of Edu., Rich Hill, Mo.

+1357—New Kingston, Penn.—This contract (p. 411), which provides for furnishing and delivering 500 tons of bituminous coal to the local schools, has been awarded to **B. J. Moorhead** on Cornell bituminous at $1.63 per ton. Address Secy. B. F. Davis, School Bd., New Kensington, Penn.

+1393—Troy, Ohio—This contract (p. 447), which provides for furnishing the Miami County Board of Commissioners with approximately 1,000 tons of coal for use at the County Infirmary, has been awarded to the **Fidelity Coal Co.**, at $2.75 per ton for 1½-in. screened lump, and $2.45 per ton for 1-in. screened lump, prices being f.o.b. sidetrack at the infirmary. There were three bidders on this business. Address County Audr. M. T. Staley, Miami County, Troy, Ohio.

+1394—New Castle, Penn.—This contract (p. 447), which provides for furnishing Lawrence County Court House and jail with coal during the coming season, has been awarded to **S. G. Gano**, at $2.49 per ton for Pittsburgh 1¼-in. screened coal. C. J. Strieb bid $2.72; Ramsey Bros., $2.63; New Castle Transfer & Storage Co., $2.59; John V. Travers, $2.63; Woods-Golder Construction Co., $2.63. Address Clk. James R. Lamoree, Bd. of County Comrs., New Castle, Penn.

+1395—Pinckneyville, Ill.—This contract (p. 447), which provides for furnishing Dist. No. 50 with coal during the school year ending June 30, 1916, has been awarded to the **Hale Coal Co.**, at $1.75 per ton for mine-run. Address Clk. C. H. Roe, Jr., Pinckneyville, Ill.

+1397—Pomeroy, Ohio—This contract (p. 447), which provides for furnishing the Salisbury Township Board of Education with coal, has been awarded as follows, rates being per bushel for clean lump coal: **T. C. Radford**, 11c.; **Walter White**, 11c.; **V. T. Lambert**, 12c.; **Homer Radford**, 8c.; **Will Hines**, 8c. Address Clk. Leo. J. Byrne, Salisbury Township Bd. of Edu., Pomeroy, Ohio.

1398—Vandegrift, Penn.—This contract (p. 447), which provides for furnishing the Vandergrift School District with Pittsburgh nut or No. 1 coal, has been awarded to **J. H. Claypool.** The contract involves eight carloads of coal. Address Secy. W. W. Wiggins, School Bd., Vandergrift, Penn.

+1402—New Lexington, Ohio—This contract (p. 447), which provides for furnishing the local Board of Education with lump and mine-run coal, has been awarded to George C. Butt at $2.15 per ton delivered. Address Clk. J. H. Cookson, Bd. of Edu., New Lexington, Ohio.

+1403—Omaha, Neb.—This contract (p. 448), which provides for furnishing the fuel requirements of the local Board of Education, has been awarded to the **C. W. Hull Co.** and **Sunderland Bros.** The contract provides for furnishing and delivering 8,500 tons of bituminous coal and 350 tons of anthracite, the bids on the former ranging from $3.88 to $4.42, and the anthracite being $10.08 per ton. Address Secy. W. T. Bourke, fifth floor, City Hall, Omaha, Neb.

+1411—Youngstown, Ohio—This contract (p. 448), which provides for furnishing and delivering approximately 800 tons of coal for the Public Service, has been awarded to the **Youngstown Ice Co.** on the following basis: ¾-in., $2.45; 1¼-in., $2.55; 3-in. nut, $2.40. The Crystal Ice and Storage Co. bid as follows: ¾-in., $2.65; 1¼-in., $2.60; 3-in. nut, $2.65. Address Clk. H. C. Fox, Pub. Service, Youngstown, Ohio.

+1412—Toulon, Ill.—This contract (p. 448), which provides for furnishing the Stark County Poor House, Court House and Jail with coal during the ensuing year, has been awarded to **R. L. McClellan** on lump coal from a local mine at 11c. per bu. The Ballentine Coal Co. bid 11½c. per bu. for Springfield lump. Address County Clk. W. E. Nixon, Stark County, Toulon, Ill.

+1413—Valentine, Neb.—This contract (p. 448), which provides for furnishing three carloads of coal to be delivered in the basement of the Court House, has been awarded to **J. W. Yeast & Son,** who were the only bidders at $7 per ton for Trenton lump. Address Clk. A. B. Green, Court House, Valentine, Neb.

1414—Granite City, Ill.—This contract (p. 448), which provides for furnishing the Corn Products Refining Co. with their fuel requirements until Apr. 1 of next year, has been awarded to the **North Breeze Mining Co.,** of St. Louis. The contract involves about 35,000 tons of Illinois one inch, and two inch screenings. Address Pur. Agt. S. J. Petit, 213-217 Illinois St., Chicago, Ill.

1415—New York, N. Y.—This contract (p. 448), which provides for furnishing and delivering approximately 3,000 gross tons of No. 1 buckwheat to the Bellevue Hospital has been awarded to **Pattison & Bowns,** at $2.69. Other bids were: Meeker & Co., $3.08; Burns Bros., $2.92; Charles D. Norton & Co., $2.81. Address Central Purchasing Committee, Room 1226 Municipal Bldg., New York, N. Y.

+1419—Bellaire, Ohio—This contract (p. 489), which provides for furnishing the Mead Township Board of Education with approximately 2,000 bu. of three-quarter coal has been awarded as follows: **J. H. Neff,** 750 bu. at 14¼c.; **William Ramsey,** 150 bu. at 12c.; **W. H. McCabe,** 580 bu. at 11½c.; **H. Warren,** 325 bu. at 12½c.; **Carl Dumfel,** 300 bu. at 14⅛c. Address Clk. Thomas C. Kirkland, Mead Township, Bd. of Edu., Belmont County, Bellaire, Ohio.

1423—Topeka, Kan.—This contract (p. 489), which provides for furnishing the Municipal Electric Light Department with approximately 400 tons of coal, has been awarded to the **Southwestern Coal Co.** on the following basis: Nut, $2.70; mill, $2.50; slack, $2.24. Address Supt. E. G. Stahl, Municipal Electric Light Dept., Topeka, Kan.

+1424—Warren, Ohio—This contract (p. 489), which provides for furnishing the County Infirmary with approximately 500 tons of coal, has been awarded to the **Peoples' Ice and Cold Storage Co.,** at $1.95 per ton, f.o.b. switch at the Infirmary. Address Aud. W. B. Harrington, Trumbull County, Warren, Ohio.

+1426—Rugby, N. D.—This contract (p. 489), which provides for furnishing the Pierce County Commissioners with lignite coal, has been awarded to the **Bovey-Shute Lumber Co.,** at $2.97 per ton. Address Audr. A. O. Spillum, Pierce County, Rugby, N. D.

+1429—Massillon, Ohio—The contract (p. 490), which provides for furnishing the Board of Education with coal during the ensuing year, has been awarded to the **Artificial Ice and Coal Co.** on the following basis: Massillon lump, $3.04; mine-run, $2.89; slack, $1.69; Goshen lump, $2.29; mine-run, $1.99; slack, $1.65. Prices include delivery in bins as required. Address Clk. William Fielberth, Bd. of Edu., Massillon, Ohio.

+1433—Peoria, Ill.—This contract (p. 490), which provides for furnishing the City Government with coal during the year beginning Oct. 1, has been awarded to **Dooley Bros.,** at $2 per ton for 1¼-in. lump coal The Thompson Coal Co. bid $2.05 for the same grade. Address Clk. Wm. E. Moran, Peoria, Ill.

1434—Poplar, Mont.—This contract (p. 490), which provides for furnishing Public School No. 9 with coal has been awarded to the **Poplar Lumber Improvement Co.** on Bear Creek lump at $7.50 a ton. Three other bids were received on this contract but they were too late to qualify. Address Clk. H. C. Walker, School Dist. No. 9, Poplar, Mont.

1458—Davenport, Wash.—This contract (p. 530), which provides for furnishing the Lincoln County Board of Commissioners with coal, has been awarded to **J. W. Sawyer** at $6.95 per ton for a Cascade Roslyn mine-run coal. Address J. E. Howard Bd. of County Comrs., Davenport, Wash.

Contract Notes

Fairbury, Neb.—The contract for furnishing the city government with its coal supply during the ensuing year has been awarded to **Venners & Green** at $1.72½c. per ton for Weir nut at the mine.

General—A commercial representative of a foreign government in Washington, D. C., reports that he is in receipt of requests for the name and addresses of American exporters of coke. Large quantities are desired.

Lewes, Del.—The Municipal Light Department at this place consumes about 1,000 tons of semi-bituminous coal per annum for which they pay about $1.55 per ton. It is understood that they do not contract. Address Supt. Charles Lynch, Lewes, Del.

Switzerland—An American consular officer in Switzerland reports that an association in his district desires to communicate with American producers and exporters of coal. Specifications, etc., may be had on application to the bureau of foreign and domestic commerce or its branch offices.

Boston, Mass.—The Gonic Manufacturing Co. consumes approximately 1,500 tons of bituminous coal. Deliveries are made by water and railroad at the rate of 30 tons per week, and they have a storage capacity of 1,000 tons. Address Pur. Agt. Samuel Rindge, Gonic Manufacturing Co., 4 Winthrop Square, Boston, Mass.

Cannel City, Ky.—Contracts calling for 500 tons daily of cannel coal are reported to have been made by the Pearsite Co., with the Kentucky Block Cannel Coal Co. here, the deliveries in the maximum to be reached by about the first of November when the dye extracting plant under construction here is due to be finished.

Chile, S. A.—The chief engineer of a gas company in Chile has informed a commercial attache of the Department of Commerce that he desires to obtain samples of the best American coking coal. The commercial attache has transmitted a report on this opportunity, which may be had on application at the bureau or its branch offices.

South Norwalk, Conn.—The South Norwalk Electric Works consumes about 1,500 to 2,000 tons of bituminous coal per annum, which is bought from local dealers at from $3.38 to $3.50 per ton. The company is using fuel oil mostly. Contracts are made at indeterminate periods. Address, Chf. Engr., W. H. Mosher, The South Norwalk Electric Works, South Norwalk, Conn.

Egypt—The steamer "Franklin" sailed from Baltimore Sept. 30 with 7,000 tons of Fairmont in the hold and 1,600 tons in the bunkers on her first trip, bound to Alexandria, Egypt. This inaugurates the regular Mediterranean service arranged by the Consolidation Coal Co. A sister ship, the "Plymouth," will be in commission in the course of a month. These ships are owned by the Coastwise Transportation Co. of Boston and are named for counties in Massachusetts.

East St. Louis—The City Council of East St. Louis, Ill., has awarded to the **William Helfrish Coal Co.,** East St. Louis, the contract for furnishing about 1,000 tons of 2-in. shaker screened coal to the City Hall, fire department and pumping stations for the period beginning Sept. 1 and ending May 1. The price is $1.60 delivered. There were eight bidders in all. The contract last year was held by the Huschle Coal Co., East St. Louis. Address Clk. David M. Walsh, East St. Louis, Ill.

Boston, Mass.—In the face of the uncertainty over conditions next season, there was a mild flurry in the market here a week ago over the rumor that one of the large distributors of Hampton Roads coals had named a low delivered price for the year beginning Apr. 1, 1916. It turned out, however, that what was named was simply a low charge for handling: that is, 75c. was quoted to include transportation from the Virginia terminals to Boston, insurance, discharging, and weighing. The proposal contemplates the use of two steamers, one of 12,600 and the other of 9,000 tons, and of a modern handling plant near Mystic Wharf, Boston. The price named is $3.60 per gross ton f.o.b. cars but it is expressly conditioned on the present circular price of $2.85 f.o.b. Hampton Roads. In other words, if the circular price of Pocahontas and New River coals for next year is higher or lower than $2.85, the distributors' contract price would be correspondingly raised or lowered, the intention being to add 75c. to the circular price in order to cover freight and handling at this end. The present railroad charge for discharging at Boston is 18c. with 3c. added for weighing when required. Subtracting 21c. from 75c. would leave but 54c. to cover water freight and insurance. This circular has been followed by others from competing distributors and it is likely that consumers inland will profit next year from this anxiety to book contracts.

COAL AGE

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Some Things Night Schools Do Not Teach

If you haven't a school for your employees, start one now. If you have one, see that the instruction includes work here referred to. If you are developing a course on the line suggested, give us the details.

Night schools are great institutions for ambitious men who desire to advance in coal mining, but they should concern themselves with other subjects in addition to English, mathematics, gases and problems of ventilation.

It is necessary that the mining man be taught to assume the right attitude toward his associates, whether they work with him or for him. Patronage of night schools is the logical way for the men to receive this training.

A candidate for a mine foreman's certificate may have completed satisfactorily the entire course of theoretical instruction arranged by any large coal company, and still this man may not be competent to fill the place of foreman.

The boss, to be a good one, must inspire loyalty and secure the interest of his employees. To do this it is essential that he be in sympathy with them, that he be strict but fair in his discipline and that he give to each of the multitude of mining details its relative importance.

It is very foolish to believe that the man who has the real, genuine "stuff" in him will develop and exercise even a small portion of the necessary qualities in a hit-or-miss manner.

Why not include instruction in the essentials of management in the night-school course? They are just as vital to the making of a successful foreman as the practical knowledge of ventilation or drainage.

It's a long jump from a coal mine to a big New York department store, but the plan of the latter in operating schools of instruction for employees, who are taught proper address to use in their daily contact with a conglomerate humanity, could be copied and applied in modified form at our mines. When a few employees are encouraged to accept right ideals, the spirit will soon be caught by the rest of the organization, and contrary internal forces will no longer pull against each other.

The miner should be taught the easiest, safest and quickest way of taking out a cut, standing timber, constructing a brattice, loading a car and transporting the coal. So many men use wrong methods simply because they see their "buddy" do it, and this could be eliminated by proper instruction.

Employers should not only direct the efforts and ambitions of their employees while at work, but also after working hours. It is these idle hours and the way they are filled in that make the man.

Ideas and Suggestions

A Plea for Conservation

By Geo. N. Lantz*

We criticize our forefathers for their methods of using and misusing timber—a natural resource for the benefit of the many, rather than the few.

We say that they took from us our heritage.

We blame them for the wasteful methods which ruthlessly destroyed their timber and ours.

We feel that they had no more right to deliberately waste and destroy than a man on his deathbed has a right to give orders for the destruction of his mills and factories.

We believe that the timber owners should have agreed among themselves to name such a price for their product as would insure a fair profit on all timber—such a price as would insure the economic operation of timber lands and would prevent the destruction of the little trees while the big trees were being cut in the logging camps.

We feel that the consumer should have been willing to bear a slightly higher cost, if not for business reasons, then from patriotic motives. Our forebears contracted debts for us to pay; they should have left us the wealth with which to pay them.

We believe that the public in those bygone days should have evinced sufficient interest to see that our rights were protected.

The State Should Have Interfered

After the failure of the timber owners, the consumers and the public, we feel that the state should have so regulated the lumber business as to permit a fair profit and compel conservative operation—to admit maximum production and to insist upon the elimination of waste.

We believe we are impartial when we so criticize our ancestors.

But we can justify them, in part. Some of the lands they depleted of timber were rendered more useful for other purposes. Much of the land was needed for other purposes. The lands so depleted could again be planted in timber; and, in their ignorance, they did not realize that timber would ever be an expensive commodity—they considered the supply inexhaustible.

Likewise will our progeny criticize us for our present methods of using and misusing coal—a natural resource for the benefit of the many, rather than the few.

They will accuse us of stealing their heritage.

They will find much to criticize in our methods of mining that permit of our covering up for all time coal that belongs to us and to them.

They will place us in the same class with a man who, knowing the end of his life was near, would go out and kill his cattle and chop down his orchards.

They will know of remedies for the conditions that shaped our course.

They will say that coal operators should have coöperated to secure a fair price for their coal; such a price as would have given a fair profit; such a price as would have permitted the extraction of thick seams and thin seams and insured property against loss.

They will feel that the consumers should have been willing to pay more, for patriotic reasons, if not for business reasons. They will cite the multitude of state, county and municipal bonds we issued for them to pay and will claim justly that we should have left them the wealth we now destroy.

They will blame the public for permitting their rights to be violated.

They will say that in the absence of any action on the part of the producers, consumers or public the state should have so regulated the mining business as to permit a fair profit and to compel conservative operation—to admit maximum output and to forbid waste.

They will be justified in so criticizing us, for they will be unable to find any extenuating circumstances.

We do not add to the value of the land by extracting the coal. We can never replace the products of our mines; we know the supply is limited.

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[*] New Straitsville, Ohio.

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United We Stand, Divided We Fall

By Pennsylvania Engineer

The coal-mining industry is a house divided. With a steep and rocky path ahead, internal strife is making the going more hazardous. While operators and miners should coöperate for their mutual benefit, they are really fighting each other, and so long as operator and miner are at "loggerheads" so long will trouble be with us.

Operator must meet miner, and miner must meet operator, on a fair and square basis. The miner must sober up and work every day the mine works. He must cease being a "floater," settle down and become a man in whom the operator can place confidence. He must endeavor to load only clean coal and must mine his coal as completely as possible with safety.

Giving Full Value Received

If a day man he must do a full day's work for his pay. He must not "soldier" a couple of hours away, but must make his work count, so that at the end of the day the company has received full value for his wage. If a driver he must strive to do the best he can and with the least abuse to the animals and rolling stock. The foreman and assistants must in every way plan and execute their work in the safest and most economical manner.

On the other hand the operator must meet his men openly and frankly. The miner today unconsciously forms an antagonistic opinion of the operator owing to ignorance of the facts. Let the operator be honest and straightforward in his dealings with his employees. If the price of coal is low and the increase in wages asked for cannot be met, explain this to them as man to man.

It certainly concerns them and they should know the facts.

Provide good dwellings, and realize that there is a distinction between the men. One man is accustomed to better home surroundings than another, and in order to receive full efficiency from both men, this fact must be realized and considered. The company that can make its employees feel that it has their welfare at heart can save many unearned dollars from passing through the pay window.

While all the above seems mere "rot" when we think of the average foreign-born coal miner, yet if he could in some way be made to feel that by helping the company in this way he will help himself, his "buddy" and the whole coal-mining industry, then he would soon develop a loyal feeling toward his employer, providing his employer in turn did his part.

It is time that the operator and miner got together, for by fighting one another they are only fighting themselves, wasting their resources in a cause which does nobody any good, but saps the vitality and weakens the strength of both.

⁂

Handling Mine Supplies

By H. H. Warner*

The proper handling of repair parts and supplies at a coal mine is a subject that should receive the close attention of both the operating and office forces. Regardless of what system is installed, many leaks can occur if proper care is not taken. When the operating department fails to interest itself in the conservation of mine supplies, leaving the matter entirely to the office force, the result is that the records frequently fall behind, and it is then likely that the next inventory will show that the company has been keeping records which are of no value.

Where a stock ledger is used, it should be kept up to date, so that it will not only control the stock, but may be used as a check against purchases of material. The following is a popular system and I believe will meet all requirements:

First, take a complete inventory of all material, repair parts and supplies in stock. After the inventory has been rechecked, the total amount will be the control over these items in dollars and cents. Separate all items under the various headings which are used to govern the operation of a mine; for instance, timbers, track material, bolts and nuts, blacksmith iron, repairs for pit cars, mining-machine repairs, motor repairs, electrical supplies, construction material, etc. This will give a separate total of the amount of money tied up in parts, with such total divided into its respective departments.

USE A SEPARATE PAGE FOR EACH ITEM

In writing the ledger use one page for each and every item, no matter how small an amount is on hand. The ledger is indexed according to the different departments or the different classes of material used in that department. By doing this the items are located in the ledger much more conveniently and satisfactorily than when they are indexed alphabetically. When the latter plan is used, such repair parts as are employed in the operation of coal-mining machines will be scattered through the ledger from A to Z. This would make it necessary to leaf each and every page in order to locate the different items.

When the ledger is posted according to the inventory and checked to balance with the controlling amount, all invoices received are charged under the proper account in the ledger. Where freight is paid out to get such items into stock, this freight should be added to the amount of the invoice and separated among the items the invoice calls for. It is also well to remember that this amount is charged to the ledger instead of the original amount of the invoice. Such a plan is always followed except where a freight account is carried and charged off against daily operation.

Invoices are kept intact for one month and then listed on the debit side of what is known as the repair, supply and material balance sheet. When material is taken out of stock and used, the mine superintendent or mine manager must furnish the office or the supply clerk with a requisition form of such items. This requisition should have an extension column for the amount, so that when it is turned into the office the articles can be priced and the amount extended, always using the ledger as a guide in making these extensions, so that when the stock of a certain article is depleted, the ledger page on that particular item will balance. After the requisition has been extended, the stock ledger account is credited with the items and amounts shown.

ACCOUNTS ARE BALANCED EACH MONTH

At the end of the month these requisitions are listed on the credit side of the balance sheet. Then by adding the last controlling figure of the previous month to the total debits of stock minus the credits, a new controlling figure will result.

The ledger invariably should be balanced every month. No debit entry should be made to the stock ledger until the material covered by the invoice has been received and placed in stock. If there is a shortage of material received from that shown on the invoice, this item should be cut off of the invoice and the balance properly charged to the ledger. Invoices should be received either in duplicate or triplicate, as this will always leave at least one copy for the stock-record file for future reference.

The system described will have to be kept up every day, especially where the items used are charged against the cost of daily operation. If it is not kept up, there will result a loose handling of the items covered in these records; and to save the records from this fate, both the office head and the operating head should see that the system is carried out as outlined and that requisitions are properly made out for all items, with proper charges and credits made after the invoices and requisitions have been received in the office. In other words, the supplies and materials should be guarded with just as much care as will be exercised in looking after an amount of cash equal to what the items represent.

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One Authority Says: "Eighty-five per cent. of the coal of all Canada is in the province of Alberta. Sixty per cent. of the coal in the British Empire is in Alberta. One-sixth of the coal in the entire world is in Alberta. Here is another way of considering it: Alberta, during the past 20 years, has produced about 20,000,000 tons. At that rate it would take 1,072,000 years to exhaust all her coal areas. At the rate Canada is using coal now Alberta could supply the Dominion for 100,000 years. At the rate the world is using coal, Alberta could keep up a continuous supply for the whole world for the next 100 years, and then have coal on hand."

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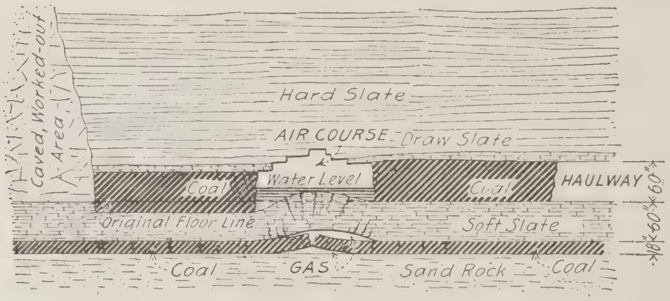
*Chicago, Ill.

Unexpected Emission of Gas

By F. C. Cornet*

SYNOPSIS—Owing to the fracturing of a lower and unworkable seam and to the crevicing of the slate measure above it, gas is allowed to escape into a mine working which prior to that occurrence had always been entirely nongaseous. The current is reversed so that this gas may no longer be driven toward the working faces.

The accompanying sketch shows a cross-section of the mine workings skirting a large worked-out territory. The weight of the overlying strata has forced down a narrow pillar of coal into the soft slate pavement. This pillar for nearly half a mile separates the worked-out area from an important air course, which serves to ventilate distant workings where a number of men are employed. The air course is also a drain for the abundant waters that find their way from the surface into the mine through the worked-out territory.



CROSS-SECTION OF MINE WORKINGS

Although the pillar to the left of the air course has sunk nearly two feet into a soft bottom, the pillar on the opposite side has not yet been appreciably driven downward. There is no doubt, however, in my mind that this pillar is slowly sinking and would have sunk deeper before this had it not been that the water from the worked-out area was intercepted by the air course and so diverted to the outside. No doubt some of the water finds its way toward the place designated as "haulway," seeping there through the soft slate pavement, softening the latter and thus making it give way slowly but surely under the weight of the 1,400 ft. of hill bearing upon it.

As shown by the sketch, when the pillar on the left sank into the soft bottom, rendered still softer by water, it compressed this bottom so that some of it was squeezed outward. As there was no empty space to the left, it is not likely that much if any of the slate forced out went in that direction. But there is ample evidence that much of it was driven into the air course, causing the pavement to heave until only one-half of the original headroom was left.

Lower Seam Is Broken by Floor Stresses

Under the soft slate that constitutes the pavement of this seam, another seam of coal is always found the thickness of which varies from a few inches to several feet. The thickness of the intervening slate runs from 2 to 80 ft. At the particular point shown by the sketch, this slate was found to be 5 ft. thick and the lower seam of coal to measure 18 in.

The lower seam rests, without adhering to it, on the highly polished surface of the hardest kind of sandstone. Its unusual smoothness indicates that in remote geologic times there must have been much friction caused by the coal sliding on the sandrock or the sandrock moving under the coal.

The lower seam does not adhere much to the overlying soft slate, but the contact surface between the two is uneven and rough enough to make it likely that when the 5 ft. of soft slate was squeezed out toward the air course there was a tendency on the part of the lower seam to go with it at least part of the way, especially as such a displacement was facilitated by the smooth and polished condition of the surface of the sandrock lying underneath.

It is not hard to imagine that in the lateral displacement of both the soft slate and the lower seam such conditions might be caused as shown by the sketch, in which the soft slate not only has heaved into the air course above, but has also separated itself from the coal underneath after displacing it and causing fissures to appear in it running in all directions. The lower seam might also have been raised partially above the sandstone. Cavities would thus be formed as shown, partly filled with débris of slate and coal, but open enough to afford easy intercommunication between all the cracks and fissures mentioned.

The heaving of the floor of the air course could not well occur without some cracks appearing in the slate of which the floor is constituted. One or more of these cracks reaching through the 5 ft. of slate would suffice to maintain a free outlet into the air course for any gas liberated by the lower seam.

No Gas Till the Lower Seam Was Fractured

The mine where this condition obtains is quite large. It is in one of the seams of the New River series. Operations had been prosecuted in it for several years and had reached far into the hills. Notwithstanding the most watchful vigilance, no gas had ever been detected in the workings. In a way more or less vague the authorities knew of what has been designated here as the "lower seam," but they never gave it more than a passing thought. They were far from expecting trouble from its presence.

But one morning a year ago a man had his hair and eyebrows singed, besides being badly scared. He set fire to a small body of gas near the roof in a place where nothing but fresh air coming direct from the fan was supposed to travel. During the next ten days four more inflammations took place, none of them serious. All were under like conditions and on a split of air between the fan and the first working places. No air reaching the spots where the accidents occurred could possibly have swept any coal except such as had been exposed to a ventilating current for at least two or three years.

No gas had ever been found at the faces. But any gas they might have found there could not by any means have been made to travel toward the fan against the air. After the first inflammation, the officials proposed making an inspection of the airways by traveling against the current from the spots where the accidents had happened, but they soon ran into some water 2 ft. deep and the inspection stopped there.

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*Mining engineer and geologist, Charleston, W. Va.

After four more explosions had occurred, a pair of rubber boots was telephoned for, and a man carrying a safety lamp was sent through the water. He did not see anything, but soon heard gas bubbling through the water and hastened to report his discovery to the foreman, who immediately understood how the mysterious accidents had occurred. A thorough investigation was made, and the sketch incorporated in this paper was prepared. The ventilation was reversed so that the fan drew the air to the mine mouth instead of driving it toward the working faces.

Though a year has passed since that time the gas from the lower seam is still passing through the cracks in the pavement and bubbling through the water in large quantity, which tends to show that when the soft slate was squeezed out from under the narrow air-course pillar, it must have disturbed and creviced a large area of the lower seam, or such a large amount of gas would not have been liberated.

Extracts from a Superintendent's Diary

Occasionally an intelligent, conscientious, hard-working employee labors on year after year without winning promotion, simply because no vacancies occur in the ranks above him. For such a man there is not a line of sympathetic advice in the whole range of literature, or if there is I have not been able to find it.

Last week one of our mining engineers tried to commit suicide, and because of the contents of a note that he prepared, thinking that it would not be read until after his death, I became interested in the subject of giving advice, especially to men who might consider themselves failures, judged by present standards, and I have read everything that seemed to bear on the subject.

It is surprising to note how all of the present-day writers on the subject of getting ahead in the world emphasize the fact that there are not enough "hundred-thousand-dollar-per-year" men to go around, and the natural conclusion to be drawn is that anyone who has the proper stuff under his cranium cannot fail to climb into the hundred-thousand-dollar class in short order.

In fact, that is exactly the conclusion our mining engineer came to some time ago, and because he did not succeed in getting advancement in spite of earnest effort, he became morose and discouraged, and finally reached a stage where he considered himself a rank failure and decided that he would be justified in ending his life.

Since his partial recovery, I have had several long talks with him and have obtained an insight into the effect that too much rose-colored exhortation may have on average men who are already making desperate efforts to reach heights which are not beyond their reach unless they become impatient.

And profiting by the insight given me, I have been able to recall some of my associates of past years and to account for many of the queer actions that characterized their last years on earth. It is all so clear now—the warning that was withheld from them, the realization of which would have carried them smiling across the long stretches of discouragement. The vision is so clear to my mind and has made such an impression upon me that I in turn have been able to interest the despondent man, and he has become eager to try his luck again.

But if I were compelled to write out a few suggestions for the guidance and encouragement of young men, I feel sure that I, too, would find myself quickly running to rosy themes.

To suggest to ambitious men that it would not be possible or desirable for all climbers to climb to the same heights seems like throwing cold water on a fire that one is trying to kindle.

It's all very well to say that most of the pleasure of living is derived from anticipation—in fact, there are plenty of men who have already said that—but how can one convey to a struggling soul the idea that anticipation may joyously be spread over a long series of years and even be carried triumphantly into the grave without having been turned into realization?

After all, in spite of the tons of literature that are being printed every year, it seems that there are some truths that have not been given to the world yet—at least not in terms that are intelligible to all of us; and that probably accounts for much of the literary effort still being put forth.

Anthracite Coal Shipments Far Behind Last Year

Total shipments of anthracite coal for the first nine months of this year, as compiled by the Anthracite Bureau of Information, were 2,688,470 tons less than for the first nine months of 1914. Shipments of anthracite for September were 5,518,771 tons, as against 6,246,192 tons in September, 1914, a decrease of 727,421 tons. The amount of coal on hand at tidewater shipping ports decreased 20,158 tons, from 653,496 tons on Aug. 31 to 633,338 tons on Sept 30.

This shortage of over 2,500,000 tons as compared with last year is partly owing to a decrease in consumption on account of the mild weather last winter and partly to the fact, reported by sales agencies and dealers, that domestic consumers have postponed buying their winter supply till the last minute.

The Lehigh Valley led in tonnage for the month, with 1,093,283 tons; the Philadelphia & Reading was second, with 895,718 tons; and the Lackawanna was third, with 820,440 tons. The Delaware & Hudson carried 737,592 tons, the Erie 718,751 tons, the Jersey Central 626,237 tons, the Pennsylvania 467,587 tons and the New York, Ontario & Western 159,163 tons.

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Responsibility for Defective Equipment—A coal operator is not liable for injury to an employee resulting from absence of a bumper on a tram car, it having been broken off, unless the defect had existed long enough to have afforded the operator opportunity to discover and remedy it, in the exercise of a reasonable degree of care for the safety of his employees. (Alabama Court of Appeals, Westbrook vs. Sloss-Sheffield Steel and Iron Co., 69 Southern Reporter, 311.)

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The Southern Appalachian Coal Operators' Association held its third quarterly meeting at the Cumberland Hotel, Middlesboro, Ky., Friday, Oct. 22, at 7:30 p.m. Reports from the chairmen of the several committees were read, and a paper on "Cost Keeping," by G. M. Shoemaker, of La Follette, was presented. The meeting was an open one, nonmembers being invited.

Making Fuel Out of Garbage

By W. D. Hornaday*

SYNOPSIS—All the city garbage of San Antonio, Tex., that can be burned is made into briquettes and sold for $6.50 per ton. Shoes, hats, paper, rags, manure, etc., are all included in the raw product from which the fuel bricks are made.

Manufacturing a high-grade fuel from garbage is a new industry that promises to solve the problem of disposing of the waste of towns and cities. In October of last year the first experimental plant of a new garbage-disposal process was established in San Antonio, Tex. It has proved so successful that a large plant is to be erected in Austin, Tex., by E. L. Culver, who is the inventor of the new process, and his associates. They have entered into a contract with the city by which they receive 25c. a ton for all the waste delivered at the plant. This is about 50c. per ton less than it now costs the city to dispose of its garbage.

FUEL-BRICK PLANT AT SAN ANTONIO, TEX.

FUEL BRICKS MADE FROM GARBAGE

The important feature of the new method of handling the waste that comes from the streets and alleys is that it is converted into a fuel that is said to be equal to bituminous coal. Mr. Culver began investigating the possibility and practicability of commercializing municipal garbage about five years ago. As a result of a long series of experiments he proved the adaptability of a method for making fuel bricks out of the refuse. This is accomplished in much the same manner that stiff mud-bricks are made. He employs practically the same machinery that is used in making cut mud-bricks. There is this difference in the process, however—the fuel bricks are not required to be as smooth and perfect as building bricks. The fuel bricks are dried in the sun or open air instead of in kilns. To produce this new fuel from garbage a mixture of equal quantities of coal dust and garbage, with an addition of 7 per cent. of water tar from gas plants or oil refineries, is used.

It takes one thousand of the fuel bricks to make a ton. They are clean and dustless and are easy and convenient to handle. In San Antonio the new fuel is being used by many people in their homes. The demand for it is said to be much greater than the supply. Its advantages are as follows: It will not slack, no matter how long it is kept in storage; it is impervious to water and burns to ashes without leaving a semblance of clinkers; and it produces no odor and little smoke when being burned. Dr. William B. Phillips, who recently experimented with the fuel bricks by burning a number of them in an open grate at his home, reports the following results:

"The briquettes had no disagreeable odor whatsoever, smelling faintly of tar; they were easy to handle, cleanly, easy to fire, gave no excess of smoke over ordinary bituminous coal, did not clinker and did not give any trouble at all in the grate. These briquettes were entirely consumed and preserved their rectangular shape, even when in the form of ashes. I was pleased with the results of burning the briquettes and would use them regularly if they could be supplied at a price comparable with that which we pay for bituminous coal in Texas—generally $8.50 per ton."

Old Shoes, Hats, Etc., Made into Briquettes

The remarkable spectacle of seeing old shoes, hats, paper, rags, straw, manure, house garbage, night soil and a variety of other waste products being thrown into one machine and emerging from another in the shape of a perfect fuel brick is to be witnessed daily at the plant in operation at San Antonio. The finished product bears no resemblance to the raw materials that enter into its manufacture. The process performs the important work of sanitation, which is considered of the utmost importance in disposing of municipal garbage. In San Antonio the experimental plant is to be enlarged so as to handle the garbage of the entire city, a contract to this effect having just been entered into by the municipal authorities and the fuel company. The City Commission of Austin, after a thorough investigation, decided to abandon its garbage incinerator and adopt the new process.

F. M. Gunn, of the Massachusetts Institute of Technology, who recently delivered a series of lectures on sanitation and garbage disposal at the University of Texas, expressed the opinion that the process which Mr. Culver invented is one of the most promising schemes so far advanced for handling city refuse.

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*Austin, Tex.

"It certainly appears to me that this is the best way of getting rid of waste and rubbish in a sanitary manner," he said, "and it may be that this method will work a new epoch in the garbage problems of the country."

In discussing the sanitary phase of the new method of handling the rubbish of towns and cities, Mr. Culver said:

"The importance of the proper disposal of waste matter in cities and towns has been recognized by health authorities and sanitary engineers everywhere, and for a few years past has been receiving the most careful and serious attention as one of the really urgent questions relating to the development of the modern city. Interest in matters affecting the public health is more widely manifested now than ever before, especially with regard to the spread of disease known to be infectious and contagious. Garbage and refuse of all kinds, if not properly taken care of, become an immediate menace to the health of the community, besides furnishing a fertile soil for the production of all manner of disease germs.

OLD DUMP METHOD OF DISPOSING OF GARBAGE

The Danger of Garbage Piles

"Garbage is also the breeding place of flies and other disease-carrying insects. The removal of waste, while protecting the city, merely carries the danger somewhere else; and the problem may be passed on, but it is not solved by the practice followed in so many cities of dumping into the rivers, streams and lakes of the country all the sewerage and the larger part of the garbage. Instead of being eliminated, the peril to the public health is greatly increased, the risk of diseases is spread over a still larger area, the air is polluted by foul odors and all the natural beauties are destroyed by such abuse.

"A satisfactory solution of the problem of sanitary disposal of the waste of cities has been difficult indeed, and the various methods adopted have been largely makeshifts of doubtful value. The method of incineration has been perhaps the best, and yet the process is open to serious objections, because the fumes from the incinerator are neither deodorized nor disinfected. So from a sanitary standpoint there is not enough accomplished to justify the large initial cost of erecting these incinerating plants with their additional heavy annual expense of maintenance, which is so great that most cities are now discarding them and using the old dumping ground."

The mechanical arrangement of the garbage-fuel plant is simple. The refuse is unloaded from wagons upon a sorting platform and then sprayed with creosote, not only as a sanitary precaution, but to allow the sorters to work with comfort. Through holes in the platform the garbage is dropped onto conveyors, which carry it to the various departments of the plant. The iron is carried into storage bins; dead animals are conveyed to the fertilizer department; bottles to the washing tank; ashes, stone and brick to a dump; tin cans to an incinerator, which removes the solder, the remaining tin pieces being baled; and the residue of the garbage is conveyed to the fuel-manufacturing department where it is made into bricks.

The entire plant is tightly inclosed so as to keep dust from escaping. The cost of manufacturing the fuel bricks is about $1.80 per ton. They sell in San Antonio for $6.50 per ton.

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Stocking Operations of the Western Railroads

Numerous rumors have been current as to plans of the different Western railroads for storing coal in anticipation of a cessation of work at the mines pending wage negotiations next spring, and an investigation develops that there is some activity in this direction.

The C., B. & Q. R.R. has arranged to store 200,000 tons at its principal coaling stations. The work was commenced several weeks ago, and that road has already approximately 190,000 tons unloaded on the ground.

While the Illinois Central R.R. has not yet commenced to stock up, it is considering the question of putting a 40 days' supply in storage, concentrating the coal at two or three central points, where there will be a regular organization for reloading, including Brownhoists, clamshells, etc.

The New York Central Lines contemplate storing a 60 days' supply on their Western lines and have already commenced unloading the coal on the ground. The Michigan Central may commence stocking at any time at its principal terminals.

The Rock Island Lines contemplate the storage of approximately 300,000 tons, or nearly a 40 days' supply, to be placed at convenient terminals. The unloading of this coal on the ground will begin immediately.

No immediate action is contemplated by such roads as the Northwestern, St. Paul, Alton, C. & E. I. and C., G. W. R.R., and it is thought that they will not commence to store coal on the ground until late in the winter, probably two or three months before the mines are shut down.

With the view of utilizing the least equipment in moving the coal, most carriers are attempting to place their storage piles at points nearest to the mines furnishing the coal. The usual method is to pile the coal on dry and well-drained locations if trestles 10 or 12 ft. high cannot be built from second-hand timbers. Tracks are not built on the coal piles for unloading or reloading, and almost always clamshells or mechanical devices are used in handling the coal. Coal is not piled to exceed 10 ft. high and 25 ft. wide at the base. Frequent openings are allowed, about 50 ft. apart, halfway down to the ground, to permit easy separation of coal which may catch fire. Every effort is made to assist the admission of air to the interior of storage piles through passages formed by timbers, piers, brickwork or other objects projecting into the coal.

Coal Shipments Through the Panama Canal

By James Steelman*

SYNOPSIS—The amount of coal passing through the Panama Canal is increasing. The most of this fuel is of American origin. It is by no means certain that the prices charged for bunker coal at the canal cover the real cost. The specifications on this fuel are such that only about the best steam coal in the country can meet them.

The Panama Canal was formally opened for business upon Aug. 15, 1914, so that by Oct. 15 an experience of two months had accrued. Leaving aside the passage of noncommercial vessels, the canal in this period witnessed the transportation through it of 583,949 tons of cargo, or an average of about 9,500 tons per day. The semiofficial statement was made, in reference to the business done by the canal for the first month and a half, to the effect that expectations had been exceeded. This seems promising, especially when we take into account that the great European War had been raging all the time.

One-half of all the business done during the first two months related to shipments between the east and west coasts of the United States, the Hawaiian Islands being reckoned in with the Pacific Coast. In respect to the character of the shipments, the general statement may be made that the cargoes passing from east to west were manufactured goods; and the cargoes passing from west to east consisted chiefly of canned goods (fruits, vegetables, salmon), lumber, grain, sugar and pineapples.

The number of passages of ships engaged in American business totaled distinctly less than 50 per cent. of all passages, while the American cargo tonnage was almost exactly 50 per cent. of the total. This shows that the domestic business was carried in vessels of a size greater than the average of those using the canal.

The trade route disclosed as next in importance is that between eastern United States and western South America. Along this route 19 per cent. of the traffic passed, so that this business, while second to our domestic interchange, was not yet a good second. Of the 19 per cent., five-sixths was northbound. This corroborates the indications perceivable before the opening. We buy from western South America, but we do not sell to any extent.

The third route in point of importance, as disclosed by the record, witnessed shipments having a total percentage of 13 out of the grand aggregate of all canal business. This route connects the Pacific Coast and Europe. Nearly the whole of these shipments went in one direction and consisted of grain. Manufactured goods from Belgium constituted 1 per cent. out of the 13.

S.S. "ANCON" PASSING THE CUCARACHA SLIDE WHEN CANAL WAS FIRST OPENED

The fourth route connects eastern United States with China and Japan. The business on it constituted 9 per cent. of the grand total of all traffic through the canal. The whole of this Far Eastern business went in one direction—from the Gulf of Mexico, Philadelphia and New York—and consisted of petroleum products.

Coal and Coke Shipments

An important development has concerned coal shipments to ports other than those at the termini of the canal itself. There were no shipments at all until Sept. 19, 1914—over a month subsequent to the canal opening. Between Sept. 19 and Oct. 3 inclusive, 34,545 tons of

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*No. 618 West 136th St., New York City.

S.S. "SANTA CLARA" ON ITS WAY THROUGH CANAL

S.S. "ANCON" IN UPPER LOCKS AT MIRAFLORES

coal passed through the canal, nearly all of it bound for western ports of North America. The remainder (6,010 tons) went to Valparaiso. It will be seen that the coal business was responsible for 6 per cent. of all business done by the canal in the first two months.

From the commercial opening of the canal to Aug. 1, 1915—nearly one year of operation, all of the period within wartime—56½ cargoes of coal and 8½ cargoes of coke have gone westward through the waterway. Coal, however, did not begin to pass through until Sept. 19. Within the 46 succeeding weeks, the coal and coke cargoes have averaged 1.41 shipments per week. But this does not give a correct view of what is now going on.

Prior to May 24, 1915, there were weeks, many of them, showing no cargo shipment of coal or coke. But since that date, no single week up to Aug. 1 (the final date of the record at the time of writing) passed without such a shipment. There were in all during this period 24½ cargoes of coal and 7½ of coke, all going west. The average for these 10 weeks was accordingly 3.20 cargoes per week. This is more than double the weekly average for the whole 46 weeks. Apparently coal shipments through the canal are decidedly upon the increase.

It will be of interest to note whence and whither the coal and the coke are going. I begin with the 7½ coke shipments. There were three of these from Baltimore—two went to Coquimbo, one to Antofagasta. Two and one-half cargoes went from Norfolk—one to Cruz Grande, one to Valparaiso and the half cargo to Callao. Of the remaining two shipments, one was from Leith, England, to San Francisco and the other from Barry to Santa Rosalia. So much for the coke.

Of the 24½ coal shipments, 15½ went out from Hampton Roads. Five of these were destined for San Francisco and three for San Diego. Four shipments went to Tiburon. The remaining three and one-half were distributed to Manila, Valparaiso and Callao. Three shipments originated at Baltimore—two for San Francisco and one for Seattle. Philadelphia was responsible for just two cargoes—one for San Francisco and one for Bremerton. There remain four cargoes to be accounted for. One was a shipment from Cardiff to Balboa, one from Guantanamo to Gatun Lake and two from Kingston to the Pacific Ocean. These last two cargoes were doubtless destined for the use of the British navy.

ORIGIN OF COAL AND COKE SHIPMENTS

It is of interest to note that the foregoing shipments represent, for the most part, business originating in the United States. Five and one-half out of 7½ coke cargoes

A TOWING LOCOMOTIVE AT GATUN LOCKS READY TO MAKE FAST TO A VESSEL went from Baltimore and Hampton Roads. Twenty and one-half of the 24½ coal shipments originated at Hampton Roads, Baltimore and Philadelphia. This preponderance of American shipments is due largely no doubt to the occupation of Great Britain and Germany with the war.

The destinations of the coke were mostly foreign points, only one shipment being for the Pacific Coast. Of the coal shipments, eight were for San Francisco, three for San Diego, one for Seattle, one for Gatun Lake, one for Balboa and one for Manila. The Balboa shipment may possibly not have had this point as its final destination. Counting it, however, we have 15 cargoes out of 24½ for the United States and possessions.

Apparently the canal business is moving along in good shape, notwithstanding the war, the coal industry being responsible for its share. There is, however, still another angle from which we may view coal and the Panama Canal. A considerable percentage of the ships passing through naturally require bunker coal somewhere on the voyage. Some will get their fuel at Hampton Roads, others perhaps at other points; but a large proportion will undoubtedly bunker at the canal itself. The Government is providing large facilities for this business, which will be at the disposal of all those requiring coal. Further, the two great storage yards and mechanical equipment which are to go into commission shortly will be at the service of private parties and concerns which wish to participate in the sale of bunker coal upon terms of a reasonable character. At present coal for bunker purposes may be obtained either at Cristobal or Balboa; that is, either at the Atlantic or at the Pacific terminus. At Cristobal coal is being sold at $5.15 and $5.40 per ton, the second price being for fuel trimmed in the bunkers. The cheaper price may be obtained by taking coal in from railroad cars alongside the wharf by the use of the ship's own gear. A steam hoist and crane may be utilized, but a charge of $1 per hr. is made for the use of the apparatus. Lighters are ordinarily used when coal is delivered and trimmed for the higher price.

STEAMER BEING TOWED BY ELECTRIC LOCOMOTIVE ON EACH SIDE

At Balboa, the prices are $6.40 and $6.15; but no handling apparatus is now available at this point. The foregoing prices are those established by the Panama R.R. It is recognized that a flat rate for all comers is inequitable. Some ships have bunkers easy to reach and easy to fill and trim; others have bunkers which present great difficulties; there will also be intermediates.

Furthermore, it is quite possible that the railroad feels that its short experience has resulted perhaps in a loss on the trimming, even on the average. The railroad was paying $2.70 for coal at Hampton Roads. The freight cost to the canal was $1.395. So that before the cost of storage and handling was added, the coal cost $4.095 at the Atlantic terminus. Some profit was naturally desired. The $1 excess in the price of coal at Balboa was due solely to the canal tolls and not in any degree to the additional transportation. Whether this $1 really covered the tolls seems to be in doubt. There is uncertainty on this fundamental matter because of the difference between practice and theory in the effect of the measurements of vessels.

CANAL CHARGE PER TON VARIES WITH VESSEL

Commercial vessels going through the canal pay $1.20 for each displacement ton of available cargo space, if the vessel carries any cargo whatever; and $0.72 for each displacement ton, if the vessel is in ballast. A collier going from Norfolk to Balboa and returning empty will be subject to both tolls, so that the coal will have to pay the total.

A displacement ton is 100 cu.ft. of space—that is, of cargo space. This may sound very simple; but in practice the determination of what is and what is not cargo space is not only difficult, but practice differs. Until a vessel has been actually measured under the rules of the Panama Canal it is ordinarily impossible to tell what the tolls will be. Measurement by other rules affords rather an uncertain guide. Probably the closest approximation to the Panama rules are those in force for the Suez Canal. The relation between the actual carrying capacity of a Norwegian tramp and its toll charges will be quite different from the relation between the same items for an American-built vessel.

Theoretically one could allow 43 cu.ft. for 1 ton of coal, and so expect to pay 43 per cent. of the round-trip toll charge of $1.92 per displacement ton. This would indicate that one ton of coal would have to bear a toll charge of $0.826. But the Panama R.R. was not clear that $1 covered it.

The uncertainty as to the relation between Panama Canal measurements and actual coal-cargo capacity is important enough to warrant the consideration of some actual examples. In making comparisons, I assume that the cargo actually on board when a ship makes the passage of the canal is approximately her real capacity. It seems reasonable to assume that shippers are going to put on board all they can.

At the end of September 1914, the "Vimeria," American registry, passed through the canal on her way from Norfolk to San Francisco with 8,340 tons of coal.

The net Panama Canal tonnage was 4,754. That is to say, the amount of coal on board should have been 475,400 divided by 43, or 11,058 tons. The amount of coal capacity should have been about 2.3 times the net canal tonnage, whereas it was actually only 1.8 times this figure.

Take another case: At the beginning of October, 1914, the American-registered vessel "Neches" from Baltimore passed through for San Diego with a cargo of 6,000 tons of coal. The net canal tonnage was 4,113, so that her cargo was really only 1.5 times her rating instead of 2.3 times. We might expect some discrepancy, but a comparison of the two examples will show that there is probably no fixed ratio between net canal tonnage and cargo capacity.

Consider a ship flying the British flag: Close following the "Neches" came the "Bankdale," British registered, with 5,943 tons. She sailed from Norfolk for Guaymas, Mexico. Her net canal tonnage was 3,637, so that she carried 1.6 times her canal rating. This is better than one of the American vessels and worse than the other.

Take another British case: "The Crown of Toledo" sailed out of Glasgow for San Francisco laden with 6,499 tons of coal, presumably British coal. Her passage through the canal was made about Oct. 19, 1914. Her canal tonnage was found to be 5,438. This makes her cargo only 1.2 times her canal rating.

Another case where the ratio is very low was furnished by the Peruvian vessel "Uruhamba," which made the passage in November, carrying 2,000 tons of coal from Cardiff for Mollendo. Her canal rating is 3,168—actually more than the cargo capacity as that capacity is to be judged by this cargo. The ratio is 0.63, which is not within gunshot of 2.3.

The fuel now being supplied for bunkering comes from the coal region in and around New River; that is, from southwestern Virginia and the neighboring district of West Virginia. The Panama R.R. has already contracted for some half million tons of this coal. The specifications are as follows:

Moisture, delivered coal, not more than	3%
Ash, dry coal, not more than	7%
Volatile matter, dry coal, not more than	21%
Sulphur, dry coal, not more than	1¼%
Fixed carbon, not less than	70%
British thermal units per pound, dry coal, not less than	14,700

Coal will be accepted where the thermal content per pound is as low as 14,400, but at a discount of ¼c. for each 25 B.t.u. or fraction thereof which may be lacking. The railroad may reject coal falling below 14,400 B.t.u. or accept it with an additional discount of double the former for the deficiency below 14,400. If the coal analyzes (the Bureau of Mines being the judge) less than 14,300 B.t.u., on a dry basis, and the railroad is compelled to accept the shipment because of its departure for the canal before receipt of the analysis, an additional penalty of 10 per cent. on the contract price is to be imposed.

The penalties indicated have in view the delivery of coal fully up to the desired thermal content of 14,700 B.t.u. In short, the railroad wants about the best steam fuel that can be supplied in quantity by American mines. The result will be a worldwide introduction of our premier grade of steam coal.

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Drag Car for the Man Trip

By Ralph W. Mayer*

SYNOPSIS—If safety drags are applied to one or more ordinary cars composing a trip, they will probably stop the trip in case of accident, but will probably also derail the cars. To prevent this a special car, properly weighted, may be equipped with drags which are easily raised or lowered.

The Northwestern Improvement Co.'s Mine No. 6, of which Peter Bagley is superintendent, has installed a drag car instead of the drag usually placed on the last car of the man trip. While the ordinary drag would stop the trip if the rope or coupling broke, it usually would result in the derailment of several cars and the possible injury of some of the men upon them.

The use of the drag car eliminates this, and the cars stay on the rails. An ordinary mine car upon which four drags are placed is used. The drags can be made from pieces of light steel rails, pointed on the trailing ends. They are hung from the car axle by means of clevises or pieces of strap iron, bolted or riveted to the drag after passing around the car axle.

Two drags are placed on each axle, next to the car wheels, so that they will touch the ground near each rail, on the inside of the track. The drags in each pair are connected by means of two ¼-in. iron rods, one near each end of the drags.

Eye-bolts are secured in the drags and the connecting rods fastened thereto by means of eyes or rings on their ends. This allows freedom of movement between the various members and permits each drag to move up and down independently of its mate, but restrains its sidewise movement.

Near the middle of each drag a hole is drilled and a chain connected by means of a clevis and bolt. A hole, 2 in. in diameter, is bored in the bottom of the car, directly over this clevis, sufficiently large for the chain to pass through without binding or catching.

A 6-in. iron pipe, reaching about 8 in. above the top of the car, is securely fastened to the car bottom, with this hole in its center. This pipe may be fastened by means of angle-irons and bolts or by heating the end of the pipe and splitting it, bending the split pieces out at right angles and bolting them to the car bottom.

A 2-in. pipe is set directly over the hole in the car bottom and inside the 6-in. pipe. It is securely held in position by wooden wedges driven between it and the 6-in. pipe, care being taken to center it over the hole in the car bottom. The 2-in. pipe should be shorter than the 6-in., the difference in their lengths being about equal to the height of the car bottom from the tops of the ties or roadbed.

The chain from the drag is led up through these pipes, and a 4-in. ring is fastened to its end. When the drag is touching the ground, this ring is inside the 6-in. pipe and resting on the end of the 2-in. pipe, which prevents it from getting out of reach and keeps the end of the chain inside the car.

A slot is cut in the top of the 6-in. pipe, sufficiently wide and deep to accommodate a chain link edgewise. This slot is placed in the side of the pipe next to the side of the car, for convenience in handling the chain.

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*Roslyn, Wash.

When it is desired to raise the drags for descending the incline, the chain is lifted out of the 6-in. pipe and pulled taut, raising its drag against the car bottom. A link of the chain is then dropped edgewise into the slot on the end of the pipe. The next link of the chain, being sidewise, is too wide to pull through the slot, and the drag is held up in a position well off the ground.

When the bottom of the slope or incline has been reached and it is desired again to bring the drags into action, it is only necessary to raise the chain out of the slot and let it drop inside the 6-in. pipe.

The car is filled with scrap iron and sand to give it the necessary weight, while it is covered over with 1-in. boards nailed flush with the top of the car. Its appearance will be much improved if it is painted and "Safety First" is stenciled upon the sides and top. The moral effect which such a car has on the men is worth considering, although the saving in time over the old method and the increased safety that results make its adoption worth while.

A low reel is placed on the front end of the car to hold the ½-in. cable which passes around the trip when hauling men. This cable, which is provided with a hook on each end, is carried forward on each side of the man trip, and the hooks are attached to a link of the chain on the end of the haulage rope.

This light cable passes around all the cars, and should a coupling break it would prevent a runaway. The cable should be short enough to fit snugly to the cars, yet not take any of the pull off the couplings, so that if the latter should break, the cars would not acquire any appreciable momentum before being caught by the cable.

This cable is held off the ground by means of hooks made from ¼-in. round iron. These are formed like an elongated letter G, the top end being slipped over the side of the car and the cable laid in the lower end or hook. Two hooks to the car, one on each side, are usually sufficient.

These hooks are kept in a box on the drag car when not in use. After the men have all been hoisted or lowered, the cable is reeled up, the hooks are placed in the box, and the car is side-tracked ready for use when again needed.

Record of Coke Works in Connellsville Region

The following tables, which constitute a complete directory of the coke manufacturers of the Connellsville region, were compiled by *The Courier* of Connellsville, Penn., and have been revised and corrected to June 1, 1915.

CONNELLSVILLE REGION

No. Ovens	Name of Works	Names of Operators, Address and Nearest R.R. Station
200	Acme	W. J. Rainey, New York, N. Y., Mt. Pleasant, P. R. R.
80	Acme	Penn Coke Co., Uniontown, Pa., Smithfield, B. & O.
290	Adelaide	H. C. Frick Coke Co., Pittsburg, Pa., Adelaide, P. & L. E.
356	Alverton	H. C. Frick Coke Co., Pittsburg, Pa., Alverton, P. R. R.
397	Baggaley	H. C. Frick Coke Co., Pittsburg, Pa., Baggaley, P. R. R.
182	Beatty	Mt. Pleasant Coke Co., Greensburg, Pa., Beatty, P. R. R.
300	Bitner	H. C. Frick Coke Co., Pittsburg, Pa., Bitner, B. & O.-P. R.R.
120	Boyer	Mt. Pleasant Coke Co., Greensburg, Pa., Udell, P. R.R.
240	Brinkerton	H. C. Frick Coke Co., Pittsburg, Pa., Brinkerton, P. R.R.
250	Buckeye	H. C. Frick Coke Co., Pittsburg, Pa., Star, P. R.R.-Pershing, B. & O.
30	Brush Run	Brush Run Coal & Coke Co., Mt. Pleasant, Pa., Mt. Pleasant, P. R.R.-B. & O.
260	Calumet	H. C. Frick Coke Co., Pittsburg, Pa., Calumet, P. R.R.
32	Carolyn	Peerless-Connellsville Coke Co., Uniontown, Pa., Alverton, P. R.R.
301	Central	H. C. Frick Coke Co., Pittsburg, Pa., Tarr, P. R.R.
150	Clare	Clare Coke Co., Greensburg, Pa., Trauger, P. R.R.
67	Coalbrook	H. C. Frick Coke Co., Pittsburg, Pa., Ruth, P. R.R.
400	Collier	H. C. Frick Coke Co., Pittsburg, Pa., Collier, B. & O.
400	Continental No. 1	H. C. Frick Coke Co., Pittsburg, Pa., Uniontown, P. R.R.-B. & O.
326	Continental No. 2	H. C. Frick Coke Co., Pittsburg, Pa., Walnut Hill, P. R.R.
300	Continental No. 3	H. C. Frick Coke Co., Pittsburg, Pa., Newcomer, P. R. R.
120	Crossland	H. C. Frick Coke Co., Pittsburg, Pa., Crossland, B. & O.
333	Davidson	H. C. Frick Coke Co., Pittsburg, Pa., Davidson, P. R.R.-Connellsville, B. & O.
40	Dexter	Connellsville Coke Co., Connellsville, Pa., West Overton, B. & O.
230	Dorothy	H. C. Frick Coke Co., Pittsburg, Pa., Latrobe, P. R.R.
40	Ellen No. 1	Whyel Coke Co., Uniontown, Pa., Whitney, P. R.R.
50	Ellen No. 2	Whyel Coke Co., Uniontown, Pa., Whitney, P. R.R
100	Elizabeth	Unity-Connellsville Coke Co., Greensburg, Pa., Dorothy, P. R.R.
200	Elm Grove	W. J. Rainey, New York, N. Y., Elm Siding, B. & O.
125	Fort Hill	W. J. Rainey, New York, N. Y., Dickerson Run, P. & L. E.
101	Gilmore	Gilmore Coke Co., Uniontown, Pa., Smithfield, B. & O.
124	Grace	W. J. Rainey, New York, N. Y., Moyer, P. R.R.
272	Hecla No. 1	H. C. Frick Coke Co., Pittsburg, Pa., Hecla, P. R.R.
340	Hecla No. 2	H. C. Frick Coke Co., Pittsburg, Pa., Trauger, P. R.R.
300	Hecla No. 3	H. C. Frick Coke Co., Pittsburg, Pa., Hecla, P. R.R.
8	Helen	Samuel J. Lohr, Youngwood, Pa., Weaver's Old Stand, P. R.R.
355	Hostetter	Hostetter-Connellsville Coke Co., Pittsburg, Pa., Hostetter P. R.R.
145	Humphreys	Bessemer Coke Co., Uniontown, Pa., Trauger, P. R.R.
42	Jimtown	Shannon Coal & Coke Co., Pittsburg, Pa., Jimtown, B. & O.
38	Johnson	Johnson Fuel Co., Uniontown, Pa., Percy, B. & O.
250	Juniata	H. C. Frick Coke Co., Pittsburg, Pa., Juniata, B. & O.
306	Kyle	H. C. Frick Coke Co., Pittsburg, Pa., Fairchance, P. R.R.-B. & O.
499	Leisenring No. 1	H. C. Frick Coke Co., Pittsburg, Pa., Leisenring, P. R.R.-B. & O.
496	Leisenring No. 2	H. C. Frick Coke Co., Pittsburg, Pa., Bute, P. R R.
502	Leisenring No. 3	H. C. Frick Coke Co., Pittsburg, Pa., Monarch, P. R.R.
304	Leith	H. C. Frick Coke Co., Pittsburg, Pa., Leith, P. R.R.-B. & O.
227	Lemont No. 1	H. C. Frick Coke Co., Pittsburg, Pa., Darent, P. R.R.-B. & O.
350	Lemont No. 2	H. C. Frick Coke Co., Pittsburg, Pa., Lemont, B. & O.
20	Little Sunshine	King Coke Co., Uniontown, Pa., Humphries, P. R.R.
32	Love	C'ville Mutual Coal & Coke Co., Scottdale, Pa., Mutual, P. R.R.
40	Magee	Magee Coke Co., Uniontown, Pa., Clare, P. R.R.
84	Mahoning	Mahoning Coal & Coke Co., Connellsville, Pa., Dunbar, P. R.R.
509	Mammoth	H. C. Frick Coke Co., Pittsburg, Pa., Mammoth, P. R.R.
400	Marguerite	H. C. Frick Coke Co., Pittsburg, Pa., Marguerite, P. R.R.
360	Mt. Braddock	W. J. Rainey, New York, N. Y., Mt. Braddock, B. & O.-Gist. P. R.R.
310	Mt. Pleasant	Mt. Pleasant Coke Co., Greensburg, Pa., Hecla, P. R.R.

This Way Out!

Written Expressly for Coal Age by R. T. STROHM

We're not just sore on the breaker,
  With its jarrin' an' its noise,
But we're mighty sure that it makes a poor
  Sort of job for a bunch of boys.
It ain't that our backs git tired,
  Or we hate the dusty air;
But we dassent shirk when the mine's at work;
  We've got to be right there.

In spring, when the season opens
  For the black bass an' the trout,
The green earth calls through the breaker's walls
  An' invites us fellers out.
An' then, for a day of fishin'
  We would sell our precious souls;
But no one goes—till a sly guy throws
  A switch-point in the rolls.

What's more, in the heart of summer,
  With the sun a-peltin' down,
The posters flare an' the trumpets blare
  An' the circus comes to town.
But we never git to see it,
  For we're busy pickin' coals—
Unless some friend takes a chance to send
  A switch-point through the rolls.

Perhaps it's a red-hot finish
  In the bush-league pennant race,
An' the home boys need just a game to lead
  An' to land in the highest place.
We know where the ball-park's fences
  Show a hundred chinks an' holes;
So no one grieves when an unknown heaves
  A switch-point in the rolls.

195	Mutual..........	H. C. Frick Coke Co., Pittsburg, Pa., Mutual, P. R.R.
32	Myers..........	Brownfield-C'ville Coke Co., Uniontown, Pa., Tarr, P. R.R
329	Nellie..........	Brown & Cochran, Dawson, Pa., Dickerson Run, P. & L.E.
252	Oliphant..........	H. C. Frick Coke Co., Pittsburg, Pa., Oliphant Furnace, P. R.R.
328	Oliver No. 1......	Oliver & Snyder Steel Co., Pittsburg, Pa., Redstone Jct., P.R.R.-Oliver, B. & O.
480	Oliver No. 2......	Oliver & Snyder Steel Co., Pittsburg, Pa., Redstone Jct., P. R.R.-Oliver, B. & O.
300	Oliver No. 3......	Oliver & Snyder Steel Co., Pittsburg, Pa., Thaw Station, P. R.R.
50	Painter..........	Newcomer Coke Co., Uniontown, Pa., McClure, B. & O.
175	Paul..........	W. J. Rainey, New York, N. Y., Dickerson Run. P. & L. E.
400	Phillips..........	H. C. Frick Coke Co., Pittsburg, Pa., Phillips Mine, P. R.R
95	Rainey..........	W. J. Rainey, New York, N. Y., Dawson, B. & O.
443	Redstone..........	H. C. Frick Coke Co., Pittsburg, Pa., Brownfield, P. R.R.-Moore Jct., B. & O.
550	Revere..........	W. J. Rainey, New York, N. Y., Revere Works, P. R.R.
110	Rist..........	H. C. Frick Coke Co., Pittsburg, Pa., Morgan, B. & O.
26	Sapper..........	Sapper Coke Co., Uniontown, Pa., Leckrone, M. R.R.-High House, B. & O.
110	Semet-Solvay.....	Semet-Solvay Co., Dunbar, Pa., Dunbar, P. R.R.-B. & O.
36	Shirey..........	South Fayette Coke Co., Uniontown, Pa., Baggaley, P. R.R.
448	Shoaf..........	H. C. Frick Coke Co., Pittsburg, Pa., Shoaf, B. & O.
560	Southwest No. 1..	H. C. Frick Coke Co., Pittsburg, Pa., Morewood, P. R.R.
150	Southwest No. 2..	H. C. Frick Coke Co., Pittsburg, Pa., Alice Mines, P. R.R.
204	Southwest No. 3..	H. C. Frick Coke Co., Pittsburg, Pa., Tarr, P. R.R.
903	Standard..........	H. C.Frick Coke Co., Pittsburg,Pa., Mt. Pleasant, P. R.R.-B. & O.
155	Stewart..........	Stewart Iron Co., Lim., Uniontown, Pa., Uniontown, P. R.R.-B. & O.
204	Summit-Eagle....	H. C. Frick Coke Co., Pittsburg, Pa., Summit, B. & O.; Summit Ter. P. & L. E.
40	Thomas..........	Whyel Coke Co., Uniontown, Pa., Smiley, B. & O.
464	Trotter..........	H. C. Frick Coke Co., Pittsburg, Pa., Trotter, P. R.R.-B. & O.
50	Union..........	W. J. Rainey, New York, N. Y., Alverton, P. R.R.
350	United..........	H. C. Frick Coke Co., Pittsburg, Pa., United, P. R.R.
200	Valley..........	H. C. Frick Coke Co., Pittsburg, Pa., Valley Works, P. R.R.-B. & O.
80	Veteran..........	Mt. Pleasant Coke Co., Greensburg, Pa., Udell, P. R.R.
33	West Penn......	West Penn Coke Co., Pittsburg, Pa., Udell, P. R.R.
80	White..........	H. C. Frick Coke Co., Pittsburg, Pa., Sherrick. B. & O.
352	Whitney..........	Hostetter-Connellsville Coke Co., Pittsburg, Pa., Whitney, P.R.R.
300	Wynn..........	H. C. Frick Coke Co., Pittsburg, Pa., Wynn Works, P. R.R
500	Yorkrun..........	H. C. Frick Coke Co., Pittsburg, Pa., Yorkrun, M. R.R.-B. & O.
245	Youngstown......	H. C. Frick Coke Co., Pittsburg, Pa., Stambaugh, B. & O., P. R.R.

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LOWER CONNELLSVILLE REGION

40	Adah..........	Adah Coke Company, Uniontown, Pa., Cheat Haven, B. & O.
400	Alicia..........	W. Harry Brown, Alicia, Pa., South Brownsville M. R.R.
200	Allison No. 1.....	W. J. Rainey, New York, N. Y., Allison, M. R.R.
200	Allison No. 2.....	W. J. Rainey, New York, N. Y., Allison, M. R.R.
142	American No. 1...	American C'ville, Coke Co., Pittsburg, Pa., Linn, P. R.R.
240	American No. 2...	American C'ville. Coke Co., Pittsburg, Pa., Martin, M. R.R.
50	American No. 3...	American C'ville. Coke Co., Pittsburg, Pa., Newcomer, P. R.R.
40	Anica..........	Wilkey & Feather Coke Co., Uniontown, Pa., Whitsett Junction, P. & L. E.
120	Atcheson..........	Republic Iron & Steel Co., Youngstown, O., Gans, B. & O.
42	Bellevernon......	Bellevernon Coal & Coke Co., Pittsburg, Pa., Bellevernon, P. & L. E.
257	Besco..........	I. W. Semans, Uniontown, Pa., Besco, P. R.R.
100	Bridgeport.......	H. C. Frick Coke Co., Pittsburg, Pa., South Brownsville, M. R.R.
470	Brier Hill........	Brier Hill Coke Co., Brier Hill, Pa., Brier Hill, M. R.R.
20	Browning.......	Browning Coke Co., Uniontown, Pa., Vance Mill Jct., P. R.R.
50	Brownsville......	Brownsville Coke Co., Uniontown, Pa., Brownsville, P. R.R.-P. & L. E.-M. R.R.
426	Buffington.......	H. C. Frick Coke Co., Pittsburg, Pa., New Salem, M. R.R.
34	Burchinal........	Smithfield Coal & Coke Co., Smithfield, Pa., Smithfield, B. & O.
34	Byrne..........	Byrne Coal & Coke Co., Scottdale, Pa., Yukon, P. R.R.
205	Century..........	Century Coke Co., Brownsville, Pa., Brownsville, M. R.R.
40	Champion.......	Champion Connellsville Coke Co., Brownsville, Pa., Brownsville, P. R.R.-M. R.R.-P. & L. E.
500	Colonial No. 1....	H. C. Frick Coke Co., Pittsburg, Pa., Smock. P. R.R.
156	Colonial No. 3....	H. C. Frick Coke Co., Pittsburg, Pa., Grindstone, P. R.R.
300	Colonial No. 4....	H. C. Frick Coke Co., Pittsburg, Pa., Grindstone, P. R.R.
120	Crystal..........	United Connellsville Coke Co., Pittsburg, Pa., Gans, B. & O.
250	Dearth..........	H. C. Frick Coke Co., Pittsburg, Pa., Low Phos., M. R.R.
236	Denbo..........	Reliance Coal & Coke Co., Pittsburg, Pa., Denbo, P. R.R.
402	Donald Nos. 1 & 2	Consolidated C'ville Coke Co., Uniontown, Pa., Grays Landing, M. R.R.
160	Donald No. 3....	Consolidated C'ville Coke Co., Uniontown, Pa., Grays Landing, M. R.R.
500	Edenborn........	H. C. Frick Coke Co., Pittsburg, Pa., Edenborn, M. R.R.
149	Edna..........	Waltersburg Coke Co., Uniontown, Pa., Waltersburg, P. R.R.
32	Emery..........	South Fayette Coke Co., Uniontown, Pa., Leckrone, B. & O.-M. R.R.
132	Eleanor..........	Sunshine Coal & Coke Co., Uniontown, Pa., Low Phos., M. R.R.
200	Fairbank........	Struthers Coal & Coke Co., Cleveland, O., Fairbanks, M. R.R.
32	Finley..........	Jas. Byrne & Co., Uniontown, Pa., New Salem, M. R.R.
400	Footedale........	H. C. Frick Coke Co., Pittsburg, Pa., Footedale, M. R.R.
80	Fretts..........	South Fayette Coke Co., Uniontown, Pa., Messmore, P. R.R.
119	Garwood.........	Etna-C'ville Coke Co., Connellsville, Pa., Simpson, M.R.R
58	Genuine..........	Genuine Connellsville Coke Co., Waltersburg, Pa., Waltersburg, P. R.R.
400	Griffin..........	Bessemer Coke Co., Pittsburg, Pa., Masontown, M. R.R.
45	Hillside..........	Westmoreland Gas Coal Co., Pittsburg, Pa., Madison, P. R.R.
210	Herbert..........	Connellsville Central Coke Co., Pittsburg, Pa., Low Phos, M. R.R.
38	Hope..........	Hope Coke Co., Uniontown, Pa., High House, B. & O.
74	Hoover..........	James H. Hoover, M'Clelland'twn, Pa., Ache Junction, M. R.R.-P. R.R.
195	Hustead........	Hustead-Semans Coal & C. Co., Uniontown, Pa., East Millsboro, M. R.R.
260	Isabella..........	Isabella-Connellsville Coke Co., Pittsburg, Pa., Isabella Sta., M. R.R.
140	Katherine........	Union-Connellsville Coke Co., Uniontown, Pa., Simpson, M. R.R.
200	LaBelle..........	LaBelle Coke Co., LaBelle, Pa., LaBelle, M. R.R.
220	Lafayette........	Atlas Coke Co., Helen, Pa., Helen, P. R.R.
462	Lambert..........	H. C. Frick Coke Co., Pittsburg, Pa., Lambert, M. R.R.
516	Leckrone........	H. C. Frick Coke Co., Pittsburg, Pa., Leckrone, B. & O.-M. R.R.
30	Leon..........	Franklin Coke Co., Mt. Pleasant, Pa., Tippecanoe, P. R.R.
400	Lincoln..........	Lincoln Coal & Coke Co., Scottdale, Pa., Waltersburg, P. R.R.
40	Little Gem.......	Bixler Coal & Coke Co., Pittsburg, Pa., Edna, B. & O.
250	Low Phos........	Connellsville Central Coke Co., Pittsburg, Pa., Low Phos, M. R.R.
34	Luzerne..........	Luzerne Coal & Coke Co., Pittsburg, Pa., Luzerne, M. R.R.
64	Marion..........	Southern Connellsville Coke Co., Uniontown, Pa., Cheat Haven, B. & O.
244	Martin..........	Republic Iron & Steel Co., Youngstown, O., Martin, M.R.R.
202	McKeefrey.......	McKeefrey Coal Co., Leetonia, Ohio, Martin, M. R.R.
300	Mt. Hope.......	Snowden Coke Co., Pittsburg, Pa., Linn, P. R.R.
60	Murphy..........	Echard Coal & Coke Co., Connellsville, Pa., Star Junction, P. & L. E.
30	Newcomer.......	Newcomer Coke Co., Uniontown, Pa., Newcomer, P. R.R.
100	Old Home.......	W. J. Parshall, Uniontown, Pa., Parshall, M. R.R.
480	Orient..........	Orient Coke Co., Uniontown, Pa., Orient, M. R.R.
34	Parshall No. 1 ...	Puritan Coke Co., Uniontown, Pa., Parshall, M. R.R.
168	Parshall No. 2....	Puritan Coke Co., Uniontown, Pa., Parshall, M. R.R.
30	Perry..........	Perry Coke Co., Pittsburg, Pa., Perryopolis, P. & L. E.
72	Plumer..........	Plumer Coke Co., Uniontown, Pa., Leckrone, M. R.R.-B. & O.
101	Poland..........	Poland Coal Co., Pittsburg, Pa., Poland, M. R.R. Extension
400	Republic	Republic Iron & Steel Co., Youngstown, O., Republic, M. R.R.
86	Rice..........	Rice Coal & Coke Co., Connellsville, Pa., Bourne, B. & O.
120	Rich Hill........	Rich Hill Coke Co., Outcrop, Pa., Outcrop, B. & O.
350	Ronco..........	H. C. Frick Coke Co., Pittsburg, Pa., Ronco, M. R.R.
373	Royal..........	W. J. Rainey, New York, N. Y., Royal Works, P. R.R.
60	Sackett..........	H. R. Sackett Coal & Coke Co., Smithfield, Pa., Outcrop, B. & O.
378	Searight..........	Taylor Coal & Coke Co., Uniontown, Pa., Low Phos., M. R.R.
260	Shamrock........	Fayette Coke Co., New Salem, Pa., New Salem, M. R.R.
100	Solon..........	Prospect Coal & Coke Co., Uniontown, Pa., New Salem, M. R.R.
310	Sterling..........	Consolidated C'ville Coke Co., Uniontown, Pa., Masontown, M. R.R.
400	Thompson No. 1..	Thompson-C'ville Coke Co., Pittsburg, Pa., Republic, M. R.R.
400	Thompson No. 2..	Thompson-C'ville Coke Co., Pittsburg, Pa., Republic, M. R.R.
320	Tower Hill No. 1..	Tower Hill-C'ville Coke Co., Uniontown, Pa., Republic, M. R.R.
394	Tower Hill No. 2..	Tower Hill-C'ville Coke Co., Uniontown, Pa., Republic, M. R.R.
500	Washington No. 1	Washington Coal & Coke Co., Dawson, Pa., Star Junction, B. & O.-P. & L. E.
500	Washington No. 2	Washington Coal & Coke Co., Dawson, Pa., Star Junction, B. & O.-P. & L. E.
76	Wineland........	Banning Connellsville Coke Co., Uniontown, Pa., Banning, B. & O.
60	Winmore........	Wineland-Gilmore Coal & Coke Co., Uniontown, Pa., Smithton, B. & O.
36	Yukon..........	Whyel Coke Co., Uniontown, Pa., Yukon, P. R. R.

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UPPER CONNELLSVILLE REGION

120	Atlantic No. 2....	Atlantic Crushed Coke Co., Greensburg, Pa., Bradenville, P. R.R.
60	Atlantic No. 3 ...	Atlantic Crushed Coke Co., Greensburg, Pa., Bradenville, P. R.R.
50	Chester No. 2....	E. A. Humphries Coal & Coke Co., Scottdale, Pa., Bradenville, P. R.R.
208	Connellsville.....	Latrobe-Connellsville Coke Co., Latrobe, Pa., Bradenville, P. R.R.
293	Derry No. 1......	Latrobe-Connellsville Coke Co., Latrobe, Pa., Bradenville, P. R.R.
50	Derry No. 2......	Latrobe-Connellsville Coke Co., Latrobe, Pa., Bradenville, P. R.R.
244	Duquesne........	Bessemer Coke Co., Pittsburg, Pa., Bradenville, P. R.R.
161	Fort Palmer......	Westm'd-C'ville Coal & Coke Co., Pittsburg, Pa., Fort Palmer, L. V. R.R.-P. R.R.
202	Graceton........	Graceton Coke Co., Graceton, Pa., Graceton, P. R.R.
136	Latrobe No. 1....	Latrobe Coal Co., Altoona, Pa., Latrobe, P. R.R.
50	Ligonier No. 2....	Ligonier Coal Co., Latrobe, Pa., Derry, P. R.R.
53	Lockport........	Bolivar Coal & Coke Co., Pittsburg, Pa., Lockport, P. R.R.
136	Loyalhanna......	Loyalhanna Coal & Coke Co., Philadelphia, Pa., Loyalhanna, P. R.R.
40	Marietta No. 1...	Marietta-Connellsville Coke Co., Connellsville, Pa., Wilpen, L. V. R.R.-P. R.R.
80	Marietta No. 2...	Connellsville Coal & Coke Co., Connellsville, Pa., Wilpen, L. V. R.R.-P. R.R.
75	Monastery.......	H. C. Frick Coke Co., Pittsburg, Pa., Latrobe, P. R.R.
200	Old Colony......	Greensb'g-Connellsville Coke Co., Latrobe, Pa., Latrobe, P. R.R.
80	Saxman..........	Latrobe-Co'lsville Coke Co., Latrobe, Pa., Latrobe, P. R.R.
71	Superior No. 1....	Latrobe-Connellsville Coke Co., Latrobe, Pa., Latrobe, P. R.R.
167	Wilpen..........	The Shenango Furnace Co., Pittsburg, Pa., Wilpen, L. V. R.R.-P. R.R.
300	Wharton........	Wharton Coal & Coke Co., Coral, Pa., Coral Station, P. R.R.

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GREENSBURG-CONNELLSVILLE REGION

57	Carbon..........	Keystone Coal & Coke Co., Greensburg, Pa., County Home Jct., P. R.R.
193	Donohoe........	Donohoe Coke Co., Greensburg, Pa., Greenwald Station, P. R.R.
100	Huron..........	Keystone Coal & Coke Co., Greensburg, Pa., Dundale, P. R.R.
400	Jamison No. 1....	Jamison Coal & Coke Co., Greensburg, Pa., Luxor, P. R.R.
516	Jamison No. 2....	Jamison Coal & Coke Co., Greensburg, Pa., Hannastown, P. R.R.
491	Jamison No. 4....	Jamison Coal & Coke Co., Greensburg, Pa., Crabtree, P. R.R.
40	Marthabel.......	Northern Connellsville Coke Co., Connellsville, Pa., County Home, P. R.R.
283	Salem..........	Keystone Coal & Coke Co., Greensburg, Pa., Allsworth, P. R.R.

2080

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Normal Production in Iowa

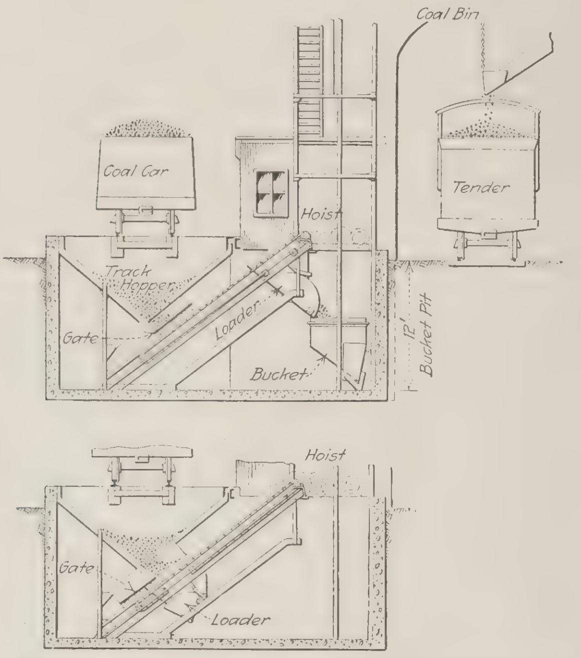
Coal production in Iowa in 1914 showed a decrease of 1 per cent. as compared with 1913, the output in 1914 being 7,451,022 short tons, valued at $13,364,070, according to figures of the Geological Survey. The number of men employed in the mines of Iowa increased from 15,757 in 1913 to 16,057 in 1914, and the average number of working days increased from 195 to 204.

Iowa is no exception to the states of the interior in which powder mining by shooting from the solid is practiced to a reprehensible degree, and the record in that respect in 1914 is worse than in either 1913 or 1912. The quantity of coal shot off the solid in 1914 was 5,545,842 tons, or 74.4 per cent. of the total; in 1913 it was 72.3 per cent., and in 1912, 69 per cent.

Shallow-Pit Coaling Station

A new design of coal-handling plant for railway coaling stations of the elevator-bucket type has a bucket pit only 12 ft. deep. This reduces the cost of the underground work and may preclude trouble with water which would be encountered with the deeper pit usually required where the coal is fed by gravity from the track hopper to the elevator bucket.

The special feature, as shown in the accompanying drawing, is that the coal is led through an undercut roller gate to a traveling loader, or bucket. This loader runs up inclined guides and dumps the coal into the elevator bucket, which in turn delivers it to the elevated bin in the usual way. The loader is of 2½ tons' capacity. It is geared to the automatic electric hoist that operates the elevator bucket, and the movement of the loader effects the opening and closing of the gate. This coaling plant is manufactured by the Roberts & Schaefer Co., of Chicago. —*Engineering News.*



MACHINE FOR COALING SHIPS AT WORKINGTON HARBOR, ENGLAND

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Indians Predict Cold Winter

The old-time Indians of the Southwestern States are prophesying an unusually long, cold winter this season. They say that the squirrels have already begun storing up goods, the bark on the trees is thicker than ordinarily, the summer has been abnormally cold and wet, the migration of birds started very early and numerous other signs which according to the aborigines never fail all go to forecast a winter of unusual severity.

It is noticeable that the full-blooded Cherokees in the Spavinaw country of Oklahoma are making extraordinary preparations for winter. For the first time in years they have stored up a surplus of fuel and food and are advising their white brethren to do likewise.

Last fall the Mesa Verde prairie dogs deserted their villages in Colorado for new ones, and the Indians visiting that locality for trading purposes shook their heads over it all winter, and said, "Rain, much rain all summer." Their prediction in this case seems to have come true. Now they are of the opinion that a very cold winter is in prospect, because the deer are more plentiful than for years, while rabbits are so numerous that one can scarcely go about without seeing them in large numbers. Coyotes and mountain lions are also unusually plentiful, which may be explained by the abundance of small game on which they live. If these Indian predictions can be relied upon, the coal man will come into his own this winter.

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More Anthracite Is Consumed in Hard-Coal Region

The increase in the amount of anthracite coal sold to the local trade and used by employees in the anthracite region of Pennsylvania, according to the latest annual report of the Department of Mines, is wholly disproportionate to the increase in population. If the amount of fuel consumed in the home is a true index of the prosperity of the region, it has prospered mightily in the decade from 1903 to 1913. The following table of the number of tons of anthracite sold to local trade and used by employees does not include the coal used at the collieries for steam and heat, which amounts to over 10% of the entire production:

Year	Tons	Year	Tons
1903	1,378,167	1909	1,805,284
1904	1,544,728	1910	1,868,369
1905	1,590,556	1911	1,990,093
1906	1,522,454	1912	2,160,096
1907	1,700,309	1913	1,943,238
1908	1,715,889		

It may be observed that there has been a steady increase in local consumption except in the year 1906, when there was a six weeks' suspension of mining while the operators and mine workers were negotiating a new agreement. There was no suspension in 1909 at the termination of this agreement, but in 1912 there was an increase in spite of the suspension. The winter of 1913 was the first of three successive warm winters, and there was a marked decrease in local consumption; but the total increase for the decade was 665,071 tons, or over 47 per cent.

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The Life of Wood Pipe

D. C. Henny, a consulting engineer of the Reclamation Service at Portland, Ore., has made an investigation into the life of wood pipe on behalf of that service. His conclusions were published in *Engineering News* of Aug. 26.

The inquiry covered three general types of wood pipe—continuous wood-stave, sectional wood-stave and sectional-bored. The probable life of various kinds of pipe is as follows:

Wood	Condition	Years
Fir	Uncoated, buried in tight soil	20
Fir	Uncoated, buried in loose soil	4 to 7
Fir	Uncoated, in air	12 to 20
Redwood	Uncoated, buried in tight soil, loam or sand, and gravel	Over 25
Fir	Well coated, buried in tight soil	25
Fir	Well coated, buried in loose soil	15 to 20

When conditions are unfavorable to the complete saturation of the wood, the life of the pipe is materially reduced. Open soil and low water pressure make it certain that the wood will not be kept continuously moist throughout. But coating the pipe appears to give the same result as a tight soil cover, and in addition the tar used in the coat possibly acts as a disinfectant. Incomplete saturation has a most serious effect on redwood, reducing its life to 15 years or less.

The author reaches the following conclusions:

(a) Under favorable conditions of complete saturation well-coated fir may last as long as uncoated redwood.

(b) Either pipe will have a longer life when well buried in tight soil than when exposed to the atmosphere. A life of 30 years and over may be reached, if a high, steady pressure is maintained.

(c) Either pipe will last longer if exposed to the atmosphere than if buried in open soil, such as sand, gravel and volcanic ash. This greater durability will only be obtained in a hot and dry climate, when the pipe is shaded from the sun.

(d) Under questionable conditions, such as light pressure of partly filled pipe, fir, even if well coated, may have only from one-third to one-half the life of redwood.

(e) Under light pressure the use of bastard-sawn staves in fir pipe should be avoided.

(f) The use of wooden sleeves in connection with wire-wound pipe is objectionable and has caused endless trouble and expense. It is possible that the objection may be partly overcome by dipping the ends of the sleeves in creosote and by applying to them a heavy coating of tar. The sleeve wood, however, will never be as perfectly saturated as the straight pipe, and full creosote treatment of the wood or else some form of metal sleeve, either riveted iron or steel, heavily coated, or cast iron will probably be well worth the extra cost.

(g) If wooden sleeves are employed on pipe from 10 in. up, they should be provided with individual bands to permit the taking up of leaks.

Wood pipe should not be used unless it can be kept full and under pressure during periods of use. The coating cannot under such conditions be expected to afford protection against decay. The coating should be continuous and heavy, and to be fully effective should be not less than $\frac{1}{16}$ in. thick, and it should preferably consist of more than one individual coat of a mixture of asphaltum and tar, or of an application of gas tar followed by one or more layers of refined coal tar. Little experience, however, can be quoted in support of all-tar coating.

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Steam Shoveling in Alberta

Alberta has 85 per cent. of the coal of Canada and [illegible]0 per cent. of all the coal in the British Empire, according to a geological statistician. One-sixth part of the coal of the entire world is in Alberta. In the past 20 years 20,000,000 tons have been mined, and if continued at this rate, the supply would last 1,072,000 years. At the rate Canada is now using coal, Alberta could fill the demand for 100,000 years. If the world's demand for fuel did not increase, that province could supply the coal needs of both hemispheres for one hundred years and still there would be fuel on hand.

The estimator took into consideration only the known fields of today. There are stretches in the northwestern and extreme northern parts of the province that as yet have not been thoroughly explored. Most of the coal is a bituminous fuel of high grade and well-suited for battleship use. During the past year D. A. Thomas, the great coal operator of Wales, spent some time in the north country and sent out half-a-dozen survey parties into the as yet unknown regions of Alberta. It was stated at the time that the Thomas interests were directly connected with the British Admiralty.

While the coal of Alberta is mined in general in the usual way, there is one point in central western Alberta where strip-pit mining is practiced. This is in the neighborhood of Tofield, a small town upon the new Grand Trunk Pacific Ry., not far from the cities of Edmonton and Strathcona. Here the coal outcroppings appear in many places right on the surface, dipping gradually below the plain. The coal is of much better grade than is generally found lying so near the surface.

TAKING COAL OUT WITH WAGONS AFTER EXCAVATION GOT TOO DEEP FOR SHOVEL

In this district the farmers nearly all have mines of their own, from which they get their supply of domestic fuel by pick and shovel. Near the town several companies have gone into the business on a larger scale. A steam shovel has been installed, and as will be seen, the seam is followed to a considerable depth.

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Pulverized Chalk, Slack and Solidified Tar have been used as fuel in Canada after being compressed into briquettes the size of an egg. They burn freely without smoke and have a high calorific value.

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Coke-Breeze Briquettes have been made successfully in Germany by the compression of the breeze after the addition of finely divided hard pitch, the whole being heated from 300 to 400 deg. C. Experiments with other binders such as thick and thin tar with additions of sawdust and coal dust failed because the briquettes ignited with too much difficulty.

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Impure Carbide gives out small quantities of phosphureted hydrogen and hydrogen sulphide on being dampened, and these gases have an unpleasant odor, but they are not generated in sufficient quantity to be injurious to health. The gases burn with the acetylene generated, and the residues are harmless. The odor of the carbide is largely owing to its impurities.

Editorials

The Colliery Engineer Consolidates with Coal Age

The Hill Publishing Co., owner of *Coal Age*, has just purchased *The Colliery Engineer*, and commencing Nov. 6 the two journals will be combined and appear as a single paper, constituting the greatest weekly in the world devoted to coal and coke.

As a result of this combination, the readers of both papers will be benefited. Those who have read only one of the two journals hereafter will receive all the information and news the industry affords instead of only a part. Those who have subscribed to both papers will in the future effect a saving in money and time through the elimination of a considerable duplication.

The plans and scope of the new weekly will be modified and enlarged through the retention of all that was best in both papers, while at the same time new features will be inaugurated that could not have been attempted by either periodical alone.

A complete announcement of the hopes and ambitions of the editors of the new journal will be printed in the first issue of the enlarged weekly Nov. 6, at which time let us all, not only the editors, but all the friends and readers of *Coal Age* as well, greet our fellow-workers in the industry with warmest hospitality.

Living no longer as two families, the readers of the greatest weekly and the oldest monthly can feel additional security in the added strength that will now carry the unified papers through good times and bad. The result will be a vehicle that will have power to do more for the industry than both papers could ever have accomplished singly.

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Gentlemen, All

At the banquet of the Nanticoke Mining Institute, held at Nanticoke, Penn., Oct. 16, Congressman John J. Casey received no little applause at his assertion that the anthracite strike would be avoided if the employers and employees would sit down and discuss their differences amicably, realizing that there was really no necessity for a suspension or a strike.

And clearly the making of a new contract should not be the occasion of bitterness. When two men who have contracted with each other in the past, one as a buyer and the other as a seller, meet to make a new bargain, there is no rancor. They often sit down and take a meal together, and their differences of viewpoint are harmonized by the effect of an excellent cuisine. Even the Arab knows that two men who eat together think in harmony.

But the miners and the operators meet to quarrel, and of course they succeed. There is trouble in the air, but there should not be. Antagonisms are capable of causing the failure of nearly all institutions. Even our own Federal Constitution is overlauded. We are told it keeps us free and happy. But if our people were filled with hatred and suspicion of one another, if our motives were of the lowest, the Constitution would inevitably fail to secure its own existence; much less would it afford us liberty and justice. The document, like all others, is less noble than the people who wrote it and who have later to defend it.

And it is so with any instrument framed to keep miner and employer in happy harmony. The contract between them is nothing unless it is an agreement between gentlemen, an understanding interpreted with friendliness and tact. There is in fact no room in a democracy for anyone but a gentleman; for when all men are equal, the personal restraint of each man is about the only assurance that even a single individual will receive his full rights.

It was interesting to hear Con Cole, a street-car motorman, mimic a miners' convention at the institute meeting and draw laughter from miners and operators in the sallies he made at the expense of both. This wage controversy is not an occasion for bigotry, and no gentleman is a bigot. It was a pity Con Cole could not also hold up to ridicule a body of operators engaged in the English sport of "viewing with apprehension." There is nothing more amusing than to meet a lot of operators and superintendents discussing the labor problem, unless it is to hear a number of workingmen canvassing the same subject.

Both may be expressing apprehension at the course affairs are taking, but surely both are giving good cause for such fears of the future. The only way to solve the mine-strike question is for miners and operators to get together and learn one another's views and put the quietus forever on partisan oratory. The crudity with which operators and miners alike try to suppress adverse opinion is deplorable. The matter of wage scale is an economic question to be debated scientifically. The choleric gentlemen, if gentlemen they can be termed, had better withdraw and leave the parleying to those who are willing to acknowledge the rights of the opposing party.

Of the rabid mine owner and the equally rabid mine worker it may be well said with Shakespeare, "A plague o' both your houses!"

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Reducing the Water Problem

Many mines are more troubled with water removal than is necessary because no attempt is made to prevent it from reaching a lower level than the opening, or from passing to some point which, though higher than the mine entry, is yet so low that the water has to be pumped out.

There are many opportunities to impound water at a high point and pipe it to the mine mouth. On its way to that entry it may pass lower elevations than its point of delivery, but like the water in a city water-supply, that drop in the line will not prevent the water from being delivered by gravity to the elevation desired.

Even when water has to be pumped from a dip, it is not uncommon to pump it over one small elevation and let it run downhill to another depression from which it must be pumped again. A continuous pipe through the second depression would have delivered the water to a point from which it would have traveled to the surface without further handling. The difficulties of handling mine water can usually be marvelously lightened when a good profile map has been constructed.

The minor depressions of an upper seam may not be coincident with the dips in other beds below, and it is well to keep this fact in mind. An undrainable point in one measure may coincide with an area in a lower with ample drainage facilities, and a borehole will take advantage of that fact.

The minor folds are the result of world stress when the beds were laid down or shortly after. They are usually different or slightly different with every bed and should not be assumed to be of the same character until the similarity is duly proved. A little care in selecting the drilling point may turn the trick. Even when two seams have their bathodic points immediately over one another, there may be a place in the upper seam which, if dried by drilling, would practically remove water from the whole upper dip, and this place may be beyond a dividing ridge in the lower bed and so may furnish the ideal spot for a borehole from the upper measure to the lower for drainage purposes.

Where a lower seam has been worked out, relief can be obtained in the upper by the process of drilling. It will be a matter of no interest then whether a low or a high spot in the lower bed is penetrated. The water will drain off in any event through the open places in the falls.

Drilling Sometimes Affords Drainage

Drainage into limestone crevices has been often advocated. Unfortunately where there are limestone and crevices there is often much water, and the practice of making a short hole or a well to the cretaceous stratum may make more trouble than it removes. But if a plug is kept handy when the hole is drilled and the driller is a man who does not fear a wetting, the risk is worth trying, for if conditions are unfavorable the hole can be plugged, and if they are propitious the water can be drained off.

There are wonderful possibilities of shutting off water from the surface by piping and fluming water past certain places where otherwise it would be engulfed. It must be remembered that water enters the mine not only through caves, but also through the open strata, and oftentimes a little care will make a wet measure dry. Sometimes a little carelessness in impounding water near a mine will make a dry mine wet and a water reservoir dry—a combination most trying to a superintendent.

The use of V-drains around falls is not as common as it should be, necessary as such drains are, and in wooded country little care is taken to protect such slight sinkages and cracks as may not yet have developed into caves, but which are already large enough to admit the water to the mine.

All this water passes to the surface eventually; the sooner it passes the more acid it is, for the sulphuric acid does not have time to become neutralized by alkalies. The less water there is to handle the longer the water may remain in the sumps for settlement. The water will then be heavy with ferric hydrate perhaps, but acid free. The hydrate is harmless and if necessary can be allowed to settle. The acid is the harmful constituent, and if the water remains long in the sumps it is quite likely to be so purified of acid as to be less harmful to pumps and boilers. Larger bodies of water cannot be impounded and are liable to do the maximum injury to engine and boiler parts. Probably a little lime dropped in a sump occasionally would make the water less harmful to equipment.

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Mechanism of Thrift

Many of our national difficulties are of our own making. It is largely our fault that all our savings are the outcome of the rich man's profits rather than of the poor man's economies, for in most cases a miner or village industrial worker would have to take a whole day and spend a day's earnings if he wanted to bank his biweekly pay. The banks at such towns as are exclusively devoted to mining are few indeed.

Banks are usually started by business men who generally establish these institutions in their home towns. Hence the big cities have perhaps altogether too many of them and the villages only too few. Many of the foreigners are banking with irresponsible persons, though the stricter state laws are breaking up the business of these fly-by-night institutions. Yet in many places nothing adequate has been provided to replace them.

The wage roll of the mines, according to the Federal census of 1909, was $412,898,346. Of course some of this money was paid to men who live in sizable towns where banks are numerous. But in such places they are swell institutions to which the miner might well hesitate to go in his mining clothes and where, rightly or wrongly, he does not care to enter even when dressed up. He looks at the city or borough bank as a place for the rich.

As a result, even when they live in towns provided with banks, these men do not save, and the nation is deprived of the capital which they should accumulate. Thrift is discouraged, and the workman is blamed for faults of improvidence with which he is not rightly chargeable. But it will be said the Government provides a way of laying aside earnings, and that is true. Still the red tape at the post office makes the placing of savings with the Federal Government unpopular. A bank which will take money from the miner without his filling any application and will give him a receipt, even if he hasn't his bankbook with him, will be sure to do a good business, as soon as confidence is established.

In the mining village there is a large source of capital going to waste. If the miner can save 10 per cent. of his earnings, the aggregate will amount to $40,000,000 per annum, and that will furnish capital for a number of strong banks. Where they are established, miners are known to bank $5 and $10 per payday with unfailing regularity, even when the mines work irregularly, and the money once deposited is rarely withdrawn, for saving men usually do not migrate as readily as the unthrifty.

But banks at mining towns will not have to depend solely on the miners. They will be sure to draw agricultural deposits wherever the ground in the neighborhood is fertile, and the business derived from the small stores and local industries will tend to add profit and opportunity to the mine bank.

The National Bank of Ellsworth, Penn., is an example of such a successful institution. The time deposits amounted last September to over $147,000 and the deposits subject to check to nearly $59,000. There were only about 1,100 men employed by the company at Ellsworth and Cokeburg. So per man there was $134 of deposits on time certificates and $54 of deposits subject to check. This is evidence that a good bank with a fair capitalization and a safe surplus can do a satisfactory business in any mining town.

The children in the Ellsworth schools alone have deposited $2,000 in the bank. This institution pays 4 per cent interest and compounds it quarterly. The total resources make the respectable showing of $275,619.05.

Only when the workingman invests his money will he defend the rights of investors; only then will he realize that the profits of investment are not outrageously high. We need also, as life-giving blood for our industries, the contributions of the workingmen, and we deliberately overlook this source of the nation's wealth when we fail to provide banks at small industrial centers like our coal-mining villages.

Legal Department

Liability of Surety on Coal Sales Contracts

By A. L. H. Street[*]

There is a well-settled general rule of law that a surety for the performance of a contract is released from liability by the act of the principals to the contract in changing the terms of the agreement in a material respect that increases the danger of the surety being held liable. This rule was lately invoked by a surety company, which secured performance of a coal-sales contract, in a suit passed upon by the United States Circuit Court of Appeals for the Third Circuit (Pittsburgh-Buffalo Co. vs. American Fidelity Co., 219 Federal Reporter 818).

Plaintiff had a contract to sell the output of the Annabelle mines, and under a collateral agreement appointed J. K. Dimmick & Co. as its exclusive agents in New England territory and as nonexclusive agents in a certain portion of the Middle Atlantic States. Each party executed a $25,000 bond to secure performance of the terms of this agreement, defendant becoming the surety. Claiming that Dimmick & Co. broke their contract in refusing to accept further shipments, plaintiff brought suit on its bond. The surety company defended on the ground that this contract had been materially altered without its consent. Under these circumstances the Circuit Court of Appeals held:

That, since the secured contract concerning sale of Annabelle coal did not restrict the parties thereto against making other contracts for sale of other fuel, the fact that Dimmick & Co. contracted with plaintiff to sell other grades of coal and coke, without notice to the surety company, did not constitute such departure from the secured contract as discharged the surety company from liability under the general rule of law stated above.

That, for like reasons, the surety cannot complain because plaintiff shipped coal other than Annabelle coal into territory where the secured contract gave Dimmick & Co. the exclusive sale of fuel of the latter grade.

That whether plaintiff's act in accepting notes from Dimmick & Co. for the price of coal delivered under the secured contract, instead of observing a clause in the agreement requiring monthly settlements, constituted such departure as released the surety depends upon whether the notes were accepted as full payment and whether the change in the manner of payment injuriously affected the surety.

That since the secured contract did not prescribe any penalty for failure of Dimmick & Co. to take 50 per cent. of the output of the Annabelle mines, as provided in the agreement, any such breach merely entitled plaintiff to enter the firm's otherwise exclusive territory and sell coal in competition with the firm to the extent of the quantities which the firm failed to take, and such breach did not constitute a departure from the contract in the sense that the surety company was released from liability.

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Recent Decisions

Right of Boss Trimmer to Recover for Injury—A boss trimmer is not entitled to recover damages for injury sustained in being crushed between the end of a coal car and a post of a tipple, resulting from his removal of a wooden block from a wheel of the car in moving the car in the process of loading, even though the car was of improper width, if he had authority to reject the car, or if the car was equipped with a sufficient brake by which he could have regulated movement of the car. (Michigan Supreme Court, Lewis vs. Wolverine Coal Co., 153 Northwestern Reporter, 26.)

Suit for Polluting Stream in Mining Operations—In a suit to recover damages resulting from defendant coal company's act in polluting the waters of a stream, spring and wells on nearby land in conducting its mining operations, it was not permissible for the defendant to show that in general the water in wells sunk near coal mines are impregnated with mineral, nor to show generally the kind of water found around coal mines. The effect of admitting such evidence would be to inject into the case collateral issues that would only in a very remote degree, if at all, shed any light on the main issues in the case. (Alabama Court of Appeals, Morton vs. Pratt Consolidated Coal Co., 68 Southern Reporter, 1015.)

Liability for Injury to Minor Employees Unlawfully Employed—When the employment of a minor is shown to be illegal, because forbidden by a statute like the Pennsylvania act of 1909, forbidding employment of boys under 16 in breakers, that in itself is sufficient evidence to charge the employer with actionable negligence, rendering him liable for injury to the minor sustained in the course of the employment. When sued for injury to a minor worker, the employer must justify the legality of the employment by proving that the employee was within the permitted age and that the employer had complied with all the statutory requirements in relation to the employment of persons of the age in question. If the law contains no provision by which the employer may protect himself, through certificates or other means, then he takes such workers into his service at his own risk, so far as their age is concerned, and a false statement by the employee in regard thereto will in no sense bar a recovery for subsequent injury. (Pennsylvania Supreme Court, Krutlies vs. Bulls Head Coal Co., 94 Atlantic Reporter, 459.)

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Sociological Department

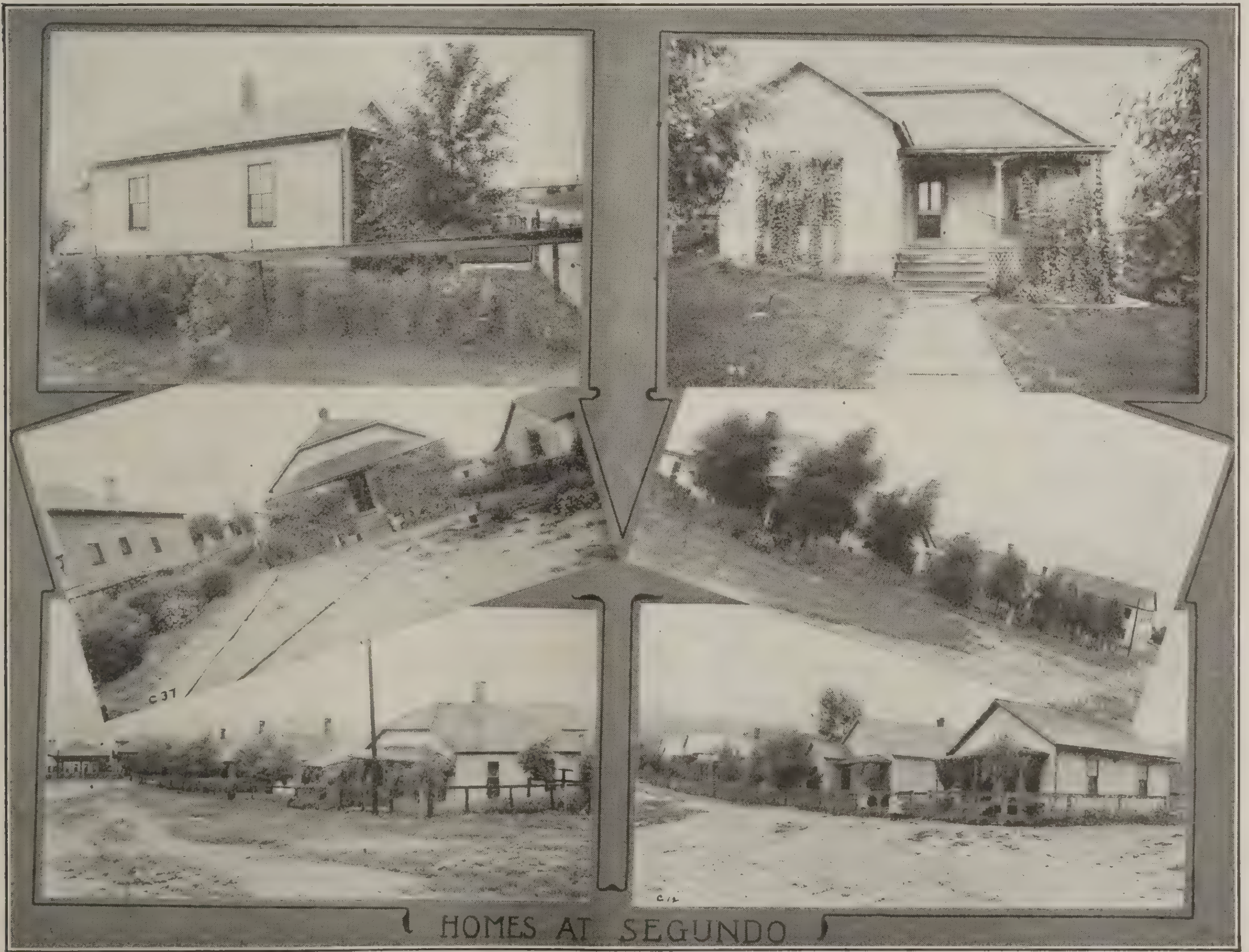
Colorado Fuel and Iron Co. Mining Villages

The Western villages are usually termed "camps" and probably in the earlier days they fully justified the name given them. But more recently there have been large improvements, and attempts have been made to supply ample water so that trees and flowers may be grown, and thus the permanent village has replaced the evanescent camp. Still if one looks at the views of the Colorado Fuel and Iron Co.'s houses at Frederick and Segundo, the uncompromising character of the ground will be noted, and the shrubs, creepers and flowers will reflect the care that has been needed and taken to embower at least the home, if the hills and the roadside must still remain unadorned.

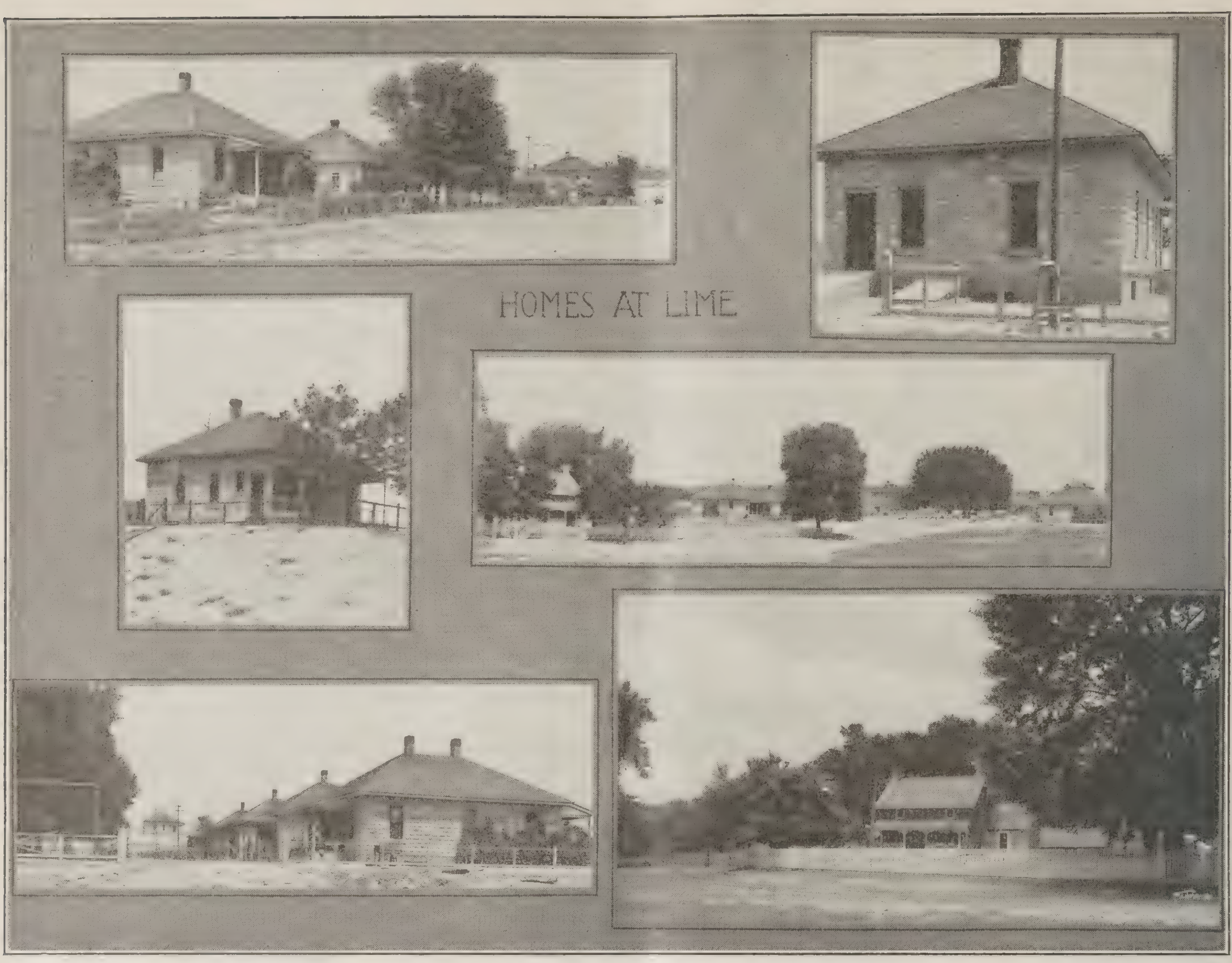
The limiting rent on these houses is $2 a room, which is higher than in the mining towns in the East by about 50 per cent.; but everything is expensive in the West owing to the long freightage, and in Colorado and Wyoming owing also to the poor quality and small size of the timber available. The rate of $2 per room seems quite general and justifiable in Colorado, Wyoming and New Mexico. But though the rent is higher than in Eastern mining villages, it is low as compared with that in incorporated towns and cities whether East or West.

A provision in the contract between the Colorado Fuel and Iron Co. and its employees stipulates that the rent shall only be limited to $2 per room when the building is without bath. The time is certainly coming when every miner will demand his bathroom and will be prepared to pay a larger rent to secure it.

The village of Segundo (or "Second"), here illustrated, is on Las Animas Creek, a branch of the Chicosa Creek, which itself empties into the Purgatory and thence into the Arkansas. The town lies about 14 mi. west of the small city of Trinidad, along the Colorado & Wyoming Ry. Lime, or San Carlos, near Pueblo, Colo., another village illustrated in this article, is not a coal town, but it shows well the ideals to which the Colorado Fuel and



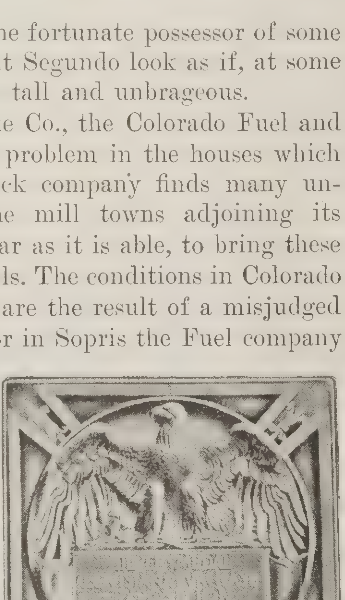
SEGUNDO, ANOTHER VILLAGE OF THE COLORADO FUEL AND IRON CO., ADJOINS PRIMERO ON THE SOUTH



AT LIME, OR SAN CARLOS, NEAR PUEBLO, COLO., THE COLORADO FUEL AND IRON CO. HAS BUILT SOME OF ITS HOUSES OF CEMENT BLOCKS INSTEAD OF TIMBER

Iron Co. is tending. It is the fortunate possessor of some really fine trees, and those at Segundo look as if, at some time, they may also become tall and unbrageous.

Like the H. C. Frick Coke Co., the Colorado Fuel and Iron Co. finds its principal problem in the houses which it does not own. The Frick company finds many unfortunate conditions in the mill towns adjoining its plants, and it is trying, so far as it is able, to bring these into conformity with its ideals. The conditions in Colorado are somewhat different and are the result of a misjudged policy in the distant past, for in Sopris the Fuel company is successor to the results of an unfortunate policy inaugurated some 30 years ago. Miners were allowed to rent land for little or nothing and were encouraged to build on it. The Central European laborers were not choice as to the manner of construction of the homes which they built, yet the company did not want to confiscate the hovels which these foreigners had erected.



SILVER MEDAL PRESENTED BY ST. LOUIS EXPOSITION TO THE COLORADO FUEL AND IRON CO.

So the plan, soon seen to be wrong, was hard to discontinue so long as the tenants desired its continuance. The company, while legally free of responsibility, has determined to buy these shacks and put up desirable residences for the men. But it is likely that the tenants will imagine that the company cares nothing for their interests and is only anxious to secure the larger rent which the transference will make necessary. Sopris, by the way, is only about 6 mi. from the village of Segundo.

Alabama Safety Association First-Aid Meet

The Alabama Safety Association held its first-aid meet on Oct. 9. The winner of the white men's events was the Republic Iron and Steel Co.'s Palos Division team, with a score of 100. Second place was secured by the Woodward Iron Co. team from Dolomite, Ala., with a score of $97\frac{4}{5}$. In all there were 14 teams competing.

The Wylam Ladies' team was the only corps of ladies in the contest. They surpassed even themselves, and so took first prize, obtaining a percentage of $97\frac{4}{5}$. There were seven colored teams, and these had a separate competition, the first prize being awarded to the Alabama Fuel and Iron Co.'s Acmar Division team, which made a score of $95\frac{3}{5}$.

The physicians who judged the event were selected by the Jefferson County Medical Association, and most of these had attended first-aid demonstrations prior to the contest to familiarize themselves with first-aid methods. The judging was consequently well performed. It is interesting to note that the Palos team of the Republic Iron and Steel Co. defended its title as an efficient first-aid organization by taking first place.

Discussion by Readers

Correct Tipple Design

I have read the article entitled "Correct Tipple Design" by M. L. Hyde, *Coal Age*, Sept. 18, p. 450, with much profit and appreciation. Nevertheless, in spite of Mr. Hyde's assurance that the methods and designs given are the best, I think there are some minor points on which it is possible for a difference of opinion to exist.

In the first place, I question whether it is good practice, in mines having a capacity of 600 tons per day, for the topman to act as lampman. Subsection 4 of sec. 124 of the Mines Act of the Province of Alberta states that "the bankman shall not leave the top of the shaft while men are ascending or descending same." Subsection 5 of sec. 113 of the same act states that "every person receiving one or more safety lamps before going on shift shall personally return them at the end of the shift to the lamphouse." I would ask, How is the bankman to see that every man returns his own lamp if he must act as topman as well as lampman? And how is he going to carry out subsection 4 of sec. 124 if he must be in the lamphouse giving out lamps to the men?

Then, again, the check system outlined in this article would seem to present some minor difficulties, though no doubt these could be overcome. Suppose a man while in the mine loses his light and, being unable to relight it, obtains a spare lamp. On going off shift he puts his check on the spare lamp instead of his own lamp. If he fails to hook his check on his lamp, he cannot get the lamp in the morning. Because he has failed to do this his check is not on his lamp and it cannot be located in the hurry of the topman in giving out lamps and caging the men at the same time.

There has been a good deal of literature written on the subject of spontaneous combustion, but I have never before read the statement made here that "waste from the tables is not liable to spontaneous combustion," etc. It seems to me that bone coal picked from the picking belts is liable to ignite spontaneously. As a matter of fact I have seen bone from picking tables ignite spontaneously. In the Lethbridge district the bone is more liable to spontaneous heating than the coal, and a little coal mixed with the bone is even more liable to spontaneous heating than either the bone or coal separately, and this mixture is what there would probably be in the bin under the picking tables.

I am rather inclined to think that 36 in. is a little too low for lights over a picking table. The pickers at most mines use picks to separate bone from any large lumps of coal, and the use of picks with lamps at this height would be liable to cause an unnecessary breakage of lamps. The distance apart of the lamps is not an arbitrary distance, such as 4 ft., but should be governed by the candlepower of the lamps used.

I certainly agree with Mr. Hyde that self-dumping cages are superior to other methods; also that there is a large amount of breakage in a weigh-pan. Nevertheless, I doubt if even steel cars could be kept with a dust-proof door, without a prohibitive cost for repairs. I am afraid that the "few dollars higher" cost would be found to be a very serious consideration, especially if repairs were considered. I fail to see how we can use self-dumping cages in combination with the system given to obviate the use of a weigh-pan, unless the mine-car scales are located at the shaft bottom. This, I think, would be an objectionable feature and would make it difficult to get the miner's check number as the car is weighed. About the only method of overcoming the difficulty is that adopted by Mr. Hyde in his standard tipple (described in the second part of the article), which apparently has no facilities at all for weighing the coal.

Aesthetic design is undoubtedly a nice thing, but I would be willing to sacrifice a little beauty in order to have the resultant pull on the rope fall a little farther inside the back stay of the tipple than is shown in Fig. 1 of the standard tipple.

J. B. de Hart.

Coalhurst, Alberta, Can.

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Efficient Mine Foremen

Letter No. 8—A man to be an efficient mine foreman must fulfill the various requirements of the state mining laws, with which he should be fully acquainted. He must possess some technical knowledge, besides having much practical experience in the business of coal mining, which will enable him to meet successfully the conditions and problems that arise in the operation of the mine and apply the proper means for their control and regulation, and to safeguard the property of his employers and the health and lives of the men in his charge. He must possess the executive ability and diplomacy that will enable him to overcome the perplexing labor troubles incident to mining, while at the same time maintaining a good balance on the right side of the ledger. His technical training should include a knowledge of the elementary principles of chemistry, mechanics and geology.

To many, this may seem an unnecessary array of qualifications for the position of foreman in a mine, but a little reflection on the wide range of subjects and the principles involved in the duties of a foreman will convince such that the statement is limited rather than exaggerated. If there is any one subject more than another with which a mine foreman should be familiar, it is that of ventilation. All practical mining men should know that the output of a mine can be increased 100 per cent. by efficient ventilation.

In conversation with mine officials, I have often asked questions in regard to the ventilation of a mine for the sole purpose of ascertaining how much they knew of the elementary principles involved. In most cases, these questions were asked of practical mining men who know how to effectively ventilate a mine, but have no knowledge of the principles on which such ventilation depends. In other words, they have never asked themselves why certain things produced certain results. No argument is needed to prove that greater effectiveness is gained, not only in ventilation, but in all branches of mining work in charge of the foreman, if that official knows why a thing is done as well as how it is done. To be most effective in any business, one must know the details of that business.

I may say that there is no industry that exhibits more effects of hidden causes than that of coal mining. Conditions and their effects confront the mine foreman on every hand, and the better he understands why these effects occur, the better he will be able to apply the most effective means for their prevention or removal.

I do not want to be understood as doubting the qualifications of a mine foreman who thoroughly understands how to ventilate a mine effectively. I only wish to emphasize how much more efficient is the foreman whose knowledge of the elementary principles involved in his work enables him to judge intelligently of the relative merits of the means he employs to accomplish certain ends.

In the ventilation of the mine, the foreman may be badly handicapped by inadequate means at his disposal for producing the required amount of air. Such a condition is not his fault, as he is seldom, if ever, consulted in reference to the design capacity or construction of the ventilator that will be best adapted to meet the requirements in the mine. These matters are wholly in the hands of the manager or the engineering department. But the efficient foreman can often make changes in the mine in regard to the plan of ventilation that will enable him to secure better results when the power producing ventilation is thus limited.

The subject of effective ventilation has been so emphasized in the Pennsylvania mining law that few, if any, mine foremen in the state fail to understand its value as a factor in the production of coal and the safety and health of the men employed in the mine. The point I would impress, in closing, is that the effectiveness of mine foremen would be greatly increased by a careful study of the simple principles that underlie our natural sciences and on which the work of mining depends.

A. M. Iner.

——, Penn.

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Handling Explosives in Mines

Letter No. 2—I was glad to see the letter of James Thirtle, drawing attention to the need of greater care and caution in respect to the handling of explosive material in a mine. My observations lead me to think that much greater care is exercised in this regard in English collieries than in mines in this country. I beg to submit the following outline of the manner of handling explosives adopted by the Wigan Coal and Iron Co., at Leigh, Lancashire, England.

Magazine Is Well Protected

The powder magazine, which is located at a safe distance from the mine, is built of brick, has a strong iron door and is surrounded by an iron fence 7 ft. high. Both the door of the magazine and the gate in the fence are securely locked, except when the supply clerk in charge of the magazine enters to deliver the explosives required by applicants. Not more than 500 lb. of explosives is permitted in the magazine at one time, and no one but authorized persons is permitted to handle powder or detonators under any conditions. The system is as follows:

System of Handling Explosives

A shotfirer accompanies the supply clerk to the magazine, where he receives the required daily supply of powder and detonators from the clerk. The latter notes down in a book the amount of powder and the number of detonators given out, which enables him to know at any time the amount of each explosive remaining in the magazine.

The shotfirer, having placed the detonators in a metallic canister designed especially for their use and securely locked, delivers the canister to an official at the bottom of the shaft, who is authorized to receive the detonators and who counts them and notes the number thus received. Not more than 100 detonators are permitted to be kept in the mine at one time. The shotfirer then takes the powder he has received and places it in locked boxes, in amounts not to exceed 5 lb. in a box, in different places in the mine, where it will be convenient for his use. Not more than one box containing a supply of powder is permitted on a single split of air.

Firing the Shots

Having done this the shotfirer proceeds to examine each place in his district and ascertain the number of holes to be fired that day. Before quitting time the shotfirer goes to the bottom of the shaft and gets the number of detonators he requires in his district from the official to whom they were previously delivered. Each shotfirer must note down in a book the number of detonators taken out by him and the date when taken and sign his name. He must also examine and sign the mine examiner's report, observing carefully if any gas is reported in his district and where. No shot is allowed to be fired within 50 yd. of any place reported as containing gas, however small a quantity of gas may have been found, unless the gas has been removed three hours previous to the time of firing the shot.

All shots are fired by the shotfirer between shifts and when not more than 10 men are in the mine, which number includes the shotfirers and their assistants only. Having secured the necessary number of detonators, the shotfirer proceeds to charge and tamp each hole, using a wooden tamping rod and clay for tamping the shot. All shots are fired by electric battery and cable. Only one shot is fired at a time, the shotfirer carrying the battery with him when he goes to connect the cable with the wires of the detonator. The cable is of sufficient length to permit the shotfirer to reach a safe distance from the shot. Before firing another shot he must examine the place where the previous shot was fired and 50 yd. on each side of the same. Special precautions are taken when blasting on main-intake and main-haulage roads. The roads are swept clean of dust for a distance of 50 yd. on each side of the shot and well watered. All electric current is shut off from power lines at the surface when shotfiring is in progress below.

Treatment of a Misfire

A misshot, when found, is fenced off, and the person who drilled the previous hole is instructed to drill another relieving hole at the side of and at least 1 ft. apart from the misshot and 6 in. deeper. In order to show the direction of the hole and avoid the possibility of the drill striking the unexploded charge when drilling the relieving hole, it is customary to draw a line on the roof showing the direction of every hole drilled. When firing a relieving hole the shotfirer must first set a post near the shot, and having attached a piece of old cable to the detonator wire of the misshot, he fastens the other end of the old cable to the post. This enables him to trace and find the detonator cap if this is not exploded when the relieving shot is fired. The missed detonator, if found, is taken outside by the shotfirer and delivered to the superintendent, who tries it again with a special battery kept in his office for that purpose. This is done to ascertain whether or not the detonator was perfect.

When the shotfirer has completed his work, he notes down in a book the number of shots fired, detonators used and the number of misshots, if any. The book form is somewhat as follows:

Detonators				Shots				
On Hand	Delivered	Returned	Balance	Coal	Roof	Missed	Date	Sign
100	30	0	70	25	5	0	10/23	F.B.

Every shotfirer undergoes a period of training as an assistant to an old experienced man, and he is not permitted to fire any shots on his own judgment until he has had the experience that will permit him to judge correctly of the quantity of powder required in different shots, depending in each case on the nature of the coal and the position of the hole. Such precautions as these, if followed in mines in this country, would make blown-out shots and accidents from blasting coal a thing of the past. JACOB RILEY.

Universal, Ind.

* * *

Prohibition and Welfare Work

Letter No. 5—I have read with deep interest the several letters written on this subject. I believe the question of prohibition is worthy of the most careful consideration by all mine officials and miners who desire better conditions in and about the mines.

LIQUOR AND THE SAFETY-FIRST IDEA

The liquor question in mining is closely connected with the safety-first idea and all efforts for betterment of mining conditions. It is strange that men who believe that the safety-first movement is the best thing that even happened will close their eyes to the sale and use of liquor in the camp. Even where a saloon is not permitted in a mining town, a "sminkey" or "speakeasy" is to be found. I would ask, What is the use of urging the safety-first idea and putting up danger signs and other safeguards against accidents when ways are provided for men to get their liquor, and as a result, a considerable portion of the workmen enter the mines in the morning with their faculties dulled and their senses blinded to danger?

THE BOOTLEGGING EVIL

I have heard it argued that it is better to allow a saloon in the town for the reason that the whisky sold by saloons is purer than that sold by bootleggers. Again, it is claimed that whisky is a good medicine, and no doubt it is; but where one is cured by its use, how many there are who are killed owing to their own indulgence or that of others. I have known men to claim sickness in order to get the whisky they wanted to drink. In the discussion of the "Liquor Question in Mining," a short time since, I was much pleased with the letter of George N. Lantz, Vol. 7, p. 731, every word of which I can indorse. This was followed, on the same page, by another letter signed "A Mine Foreman," in which attention was drawn to the important fact that the license of the sale of liquor by the Federal Government in any of the states encourages the practice of bootlegging, in direct opposition to state and county laws that prohibit the sale of liquor within their boundaries. It would seem that this is an unfair dealing on the part of the Federal Government and that the Federal license should be limited to states and counties having no prohibition laws.

THE SALOON AND THE MINER

The claim is frequently made, as in the article entitled "Prohibition from a Miner's Viewpoint," by an Ohio superintendent, July 17, p. 80, that "we have no right to deprive these [foreign] miners of their enjoyment in liquor drinking or their poor man's club—the saloon—unless we can give them in return something besides work that will take the place of these evils." While believing this to be true, I would ask, Should we keep up a practice, for the sake of the foreigner, that is sending hundreds of American miners to their graves? I would ask the advocates of saloons in mining towns if they would be willing to allow themselves to be lowered 200 or 300 ft. into a mine knowing that a drunken hand holds the throttle. There is but one answer to that question.

Again, why should we join in or permit a practice that not only renders the miner more subject to accident by blunting his sensibilities, but may even incapacitate members of the first-aid team and cause them to blunder at a critical moment? All will agree that it is dangerous to enter a mine, much less to work therein, except with every faculty alert and under control.

Attention has been drawn to the need of providing other diversions when removing the saloon—things that will take the place of the saloon for men who frequent those places. I will not attempt to say what kind of diversions will prove most successful. Much good has been done along this line by many coal companies and by the Y. M. C. A. extension work. I do not believe that either of these, however, has been as successful as the work deserves. The efforts of the company are almost invariably regarded by the miners as being prompted by a selfish desire to increase their own gains. Too often the miner considers that all mine officials, from the president to the assistant foreman, think of nothing but what has a dollar mark before it and involves a 99-per cent profit. This is a great mistake.

TWO INTERESTING INCIDENTS

I recall working for a superintendent who was thought to be one of the hardest-hearted men in the county. On one occasion a driver was caught between a car and the rib and severely injured. A little later the mine foreman and his assistants were summoned to the superintendent's office, where a conference was held to ascertain who was responsible for the accident. It was shown that the mine foreman had directed one of his assistants to widen this place, but he had neglected to do the work. The expected upbraiding of the assistant for this neglect did not come; but, instead, the superintendent said, "Boys, I want you to do two things in your daily rounds of the mine—first, keep away from strong drink and, second, give the miners all the protection that can possibly be provided, for I would rather see the tipple burn down than know that I was the cause of crippling a man or injuring his health." That little incident convinced me that mine officials have hearts like other men and that this hard-hearted superintendent fully realized the importance of his men keeping away from liquor.

I recall another instance where whisky was the cause of more trouble than all the liquor in the state was worth: The drivers in a certain mine decided they would not water their mules and brought up the matter at their union meeting. While the question was being discussed and the leaders were trying to get the matter settled, a big drunken bully came in and took part in the discussion. He told the men that they were weak-minded and afraid to strike, and after cussing the superintendent, stated that he would whip the first man who went down the next day. As a result a local strike was voted by the men, who were much surprised the next morning to see this bully enter the mine in his working clothes and equipped for work. On being threatened, later, he stated he did not know anything he had done at the meeting the night before; he did not remember going to the meeting, he was so drunk. I cite this incident to show the danger of strong drink in a mining community.

Injured by Accident When Drunk

In connection with this subject I want to ask, If a man is known to have been under the influence of liquor when he was killed or injured, would the company that employed him be responsible for the accident? I knew of a case of this kind that was thrown out of court by the judge, who refused to proceed when it was known that the injured man was under the influence of liquor at the time of the accident. Although a surprise to some, the action of the judge would seem to be fully warranted, as the injured man was in no condition for work at the time when the accident occurred.

I have always favored prohibition, especially in mining towns. The acts of a single drunken miner may not only cost him his own life, but may produce untold suffering and anguish for a large number of his fellow workers and those dependent on them. I believe, however, that our efforts are not exerted in the right direction. Instead of trying to stop the sale of liquor, we should endeavor to prevent its manufacture. I hope to live to see the day when this will be done.

OSTEL BULLOCK.

Bevier, Ky.

Study Course in Coal Mining

By J. T. Beard

The Coal Age Pocket Book

DENOMINATE NUMBERS

A **denominate number** is one expressed in units of a certain kind; as, for example, 5 days, 8 men, etc.

A **compound denominate number** is one expressed in two or more units; as 3 hr. 20 min., 8-ton mi., 4-acre-ft., etc. The terms ft. per sec., mi. per hr., rev. per min., etc., are all compound units.

An **abstract number** is any number not expressed in units of a kind; as 3, 5, 8, etc.

Kinds of Units—The principal kinds of units may be classed as follows:

1. Units of **weight;** as tons, pounds, ounces, grains, etc.
2. Units of **length** or distance; as miles, feet, inches, etc.
3. Units of **volume;** as cubic yards, cubic feet, etc.
4. Units of **capacity;** as gallons, quarts, pints, etc.
5. Units of **surface** or area; as square miles, square feet, etc.
6. Units of **time;** as years, months, days, hours, etc.
7. Units of **circular measure;** as degrees, minutes, etc.
8. Units of **currency;** as dollars, dimes, cents, etc.

WEIGHTS AND MEASURES

Systems in Use—There are two systems of weights and measures in general use, known as the "English, United States, or British," and the "French or metric" systems.

The **basis of comparison** of the English and French systems is expressed by the following established values:

Weight—The pound (7,000 grs.) is the same in the United States and Great Britain. The pound avoirdupois is equal to 453.5924277 grams in the French system.

Length—(United States) The length of the meter, by act of Congress, is 39.37 in. (Great Britain) The length of the meter, by act of Parliament, is 39.37079 in.

The slight difference in the length of the meter, as established by law in the United States and in Great Britain, makes the English inch and yard proportionally shorter than the same units in the United States.

Capacity—The gallon and liter are the accepted units of comparison in the English and French systems, respectively. The United States or "Winchester gallon," however, is quite different from the "Imperial gallon" of Great Britain, which was made the volume of 10 lb. of distilled water, at maximum density (4 deg. C.), weighed with brass weights in air at 62 deg. F., barometer 30 in.

Since 1 cu.in. pure water, under the same conditions, weighs 252.458 grs. and 1 lb. = 7,000 grs., the volume of the imperial gallon of Great Britain is

$$\frac{10 \times 700}{252.458} = 277.274 \text{ cu.in.}$$

The volume of the Winchester gallon of the United States is 231 cu.in. The French liter is the volume of 1 kg. of distilled water, at 4 deg. C., weighed in a vacuum, or 1000 c.c., which gives

Winchester gallon (United States), 231 cu.in. = 3.78543 liters.
Imperial gallon (Great Britain), 277.274 cu.in. = 4.54346 liters.

The Coal Age Pocket Book

UNITED STATES AND BRITISH SYSTEM

Following are the more useful of the tables of weights and measures in the English system:

AVOIRDUPOIS WEIGHT

		Equivalents	
16 drams	= 1 ounce	437.5	grains
16 ounces	= 1 pound	7,000	grains
28 pounds	= 1 quarter	448	ounces
4 quarters	= 1 hundredweight	112	pounds
20 hundredweight	= 1 long ton	2,240	pounds
Or, 25 pounds	= 1 quarter	400	ounces
4 quarters	= 1 hundredweight	100	pounds
20 hundredweight	= 1 short ton	2,000	pounds

The short ton (2,000 lb.) is more generally used in the United States.

TROY WEIGHT

24 grains	= 1 pennyweight		
20 pennyweights	= 1 ounce	480	grains
12 ounces	= 1 pound	5,760	grains

APOTHECARIES WEIGHT

20 grains	= 1 scruple		
3 scruples	= 1 dram	60	grains
8 drams	= 1 ounce	480	grains
12 ounces	= 1 pound	5,760	grains

The grain (Troy) is the same as the grain (apothecaries) and is the basis of comparison of these and avoirdupois weights. Thus,

1 lb. avoirdupois = 7,000/5,760 = 1.21528 lb. troy.
1 lb. troy = 5,760/7,000 = 0.822857 lb. avoirdupois.
1 oz. avoirdupois = 437.5/480 = 0.911458 oz. troy.
1 oz. troy = 480/437.5 = 1.097143 oz. avoirdupois.

LONG MEASURE

12 inches	= 1 foot		
3 feet	= 1 yard	36	inches
5½ yards	= 1 rod, perch, or pole	16½	feet
40 rods	= 1 furlong	660	feet
8 furlongs	= 1 mile	5,280	feet
3 miles	= 1 league		

The old surveyor's chain of 100 links (1 link = 7.92 in.) was 66 ft. long, making 80 chains = 1 mi. Chains now in common use are 50,100 and 300 ft. long, made up of 1-ft. links.

A fathom is 6 ft. or 2 yd., used in estimating depth.

SQUARE MEASURE

144 square inches	= 1 square foot
9 square feet	= 1 square yard
30¼ square yards	= 1 square rod
40 square rods	= 1 rood
4 roods	= 1 acre
640 acres	= 1 square mile

An acre contains 43,560 sq.ft. and measures 208.7 ft. on each side; $\sqrt{43,560} = 208.7$ ft.

Inquiries of General Interest

Handling Cars on Pitches

We are working a low seam of coal where the pitch is too great to allow the cars to be handled by hand and the seam is too low to permit mules to enter the rooms without brushing the roof over the road, which would entail too great an expense. The pitch of the seam is not sufficiently great to make the coal slide even when sheet iron is used in the chutes.

I have been informed that this seam can be worked most economically by employing a double-track gravity system in the rooms. As I am not familiar with this system of mining, will you kindly explain the method in detail? I will say that we are working under a fairly good roof, which will permit the use of the double track in the rooms if such a system is practicable. I would much appreciate, also, hearing from others who have had experience in working coal with such a system.

MINE SUPERINTENDENT.

——, Wash.

Before answering this interesting question, which we hope will lead to much practical discussion, it will be well to state the average grade limits for the different methods or systems of handling cars in rooms. The limit of grade on which cars can be handled economically and with safety is considerably modified by both the condition of the track and the rolling stock. Where the bottom is a soft fireclay, the track in the rooms often becomes very slippery. Again, where wood instead of iron rails are used in the rooms, the cars can be handled on a steeper pitch.

Following are the different systems in use for handling cars in the rooms, together with their average grade limits:

Cars handled by hand	Level— 6°
Cars lowered and hoisted by windlass	5°—10°
Self-acting incline	5°—15°
Gravity plane with barney	10°—30°
Buggy system in thick seams	10°—18°
Chutes lined with sheet iron (anthracite)	15°—30°
Chutes in natural formation (anthracite)	30°—up

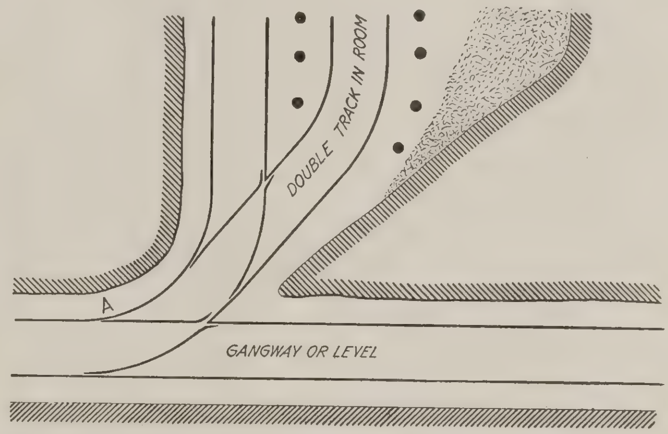
By adopting the alternative of driving the rooms at an angle with the gangway or level, it is possible to reduce the percentage of grade so that the grade limits mentioned above will apply to seams of steeper inclination. In this case, calling the angle of inclination of the seam the "dip angle" and the percentage of grade of the track the "grade angle," the ratio of the tangent of the grade angle to the tangent of the dip angle is equal to the sine of the angle the road makes with the gangway, measured in a horizontal plane. Calling the angle between the rooms and the gangway A, this relation is expressed by the formula

$$\sin A = \frac{\tan \text{grade angle}}{\tan \text{dip angle}}$$

For practical reasons, the angle between the rooms and the gangway is seldom less than 45 deg. For this angle (45 deg.) the tangent of the grade angle, or the percentage of grade, is seven-tenths of the tangent of the dip angle.

The system referred to by correspondent is illustrated in the accompanying figure, which shows the switch on the gangway as having fixed points, while that at the mouth of the room, for the double track, has movable points that are operated by the loaded car as it passes down to the gangway, leaving the switch set for the return of the ascending empty car on the same track.

In this system both the empty and the loaded cars are attached to a steel ¼- or ½-in. cable. One end of this cable is made fast by a clevis and pin to the loaded car. The cable passes over a 12- or 14-in. sheave or grooved wheel at the head of the incline and then down the other track, where it is made fast to the empty car standing on the gangway. In order to avoid the frequent splicing of the cable as the face of the room is advanced and a greater length of cable is required, the latter is made longer and the surplus length bound in a coil, which is laid on top of the car.



PLAN SHOWING ARRANGEMENT OF SWITCHES FOR DOUBLE-TRACK INCLINE IN ROOM

The system is a gravity system, or a self-acting incline, in which the descending loaded car draws up the ascending empty. The movement of the cars is controlled by a heavy brake stick, which is inserted between the groove of the sheave at the head of the incline and the clevis by which this sheave is made fast to the post, the clevis acting as a fulcrum for this improvised brake.

The post to which the head-sheave is attached, by means of a short length of chain or cable and a suitable clevis, is set in hitches cut in the roof and floor of the seam. As the face of the room is advanced, this post is moved up the pitch, and the cable supporting the cars is then lengthened by unwinding the coil previously mentioned. The pull of the cable on the empty car as it starts off the gangway is sufficient to cause this car to take the switch. The follower rail of the main track, marked A in the figure, is made slightly higher than the other rail of this track so that cars on the main line will not take the switch.

Examination Questions

Recent Iowa Examinations for Hoisting Engineers

(Selected Questions)

Ques.—(*a*) What is steam and how is it produced? (*b*) What is meant by high-pressure and what is low-pressure steam?

Ans.—(*a*) Steam is water vapor produced by evaporation of the water. Evaporation takes place at all temperatures, but is facilitated by the application of heat, causing an increase of temperature; also by a decrease of pressure. Under normal atmospheric pressure at sea level (14.7 lb. per sq.in.), pure water boils and steam is formed at a temperature of 212 deg. F. In the production of steam in a boiler, for power purposes, the temperature at which vaporization takes place increases with the pressure.

(*b*) There is no point of the gage that marks the distinction between low-pressure and high-pressure steam. For heating purposes, low-pressure steam is used, the pressure not exceeding 10 lb. per sq.in. For power purposes, perhaps the best answer that can be given to this question is to say that low-pressure steam is steam that has undergone one or more expansions, as in the case of the steam entering the low-pressure cylinder of a compound engine. On the other hand, high-pressure steam may be understood as referring to steam that enters the cylinder of the engine at or near boiler pressure.

Ques.—(*a*) In what respect is a flue boiler different from a tubular boiler? (*b*) Which is the more economical, and why?

Ans.—(*a*) The difference between these two types of boilers consists chiefly in the size and number of the flues or tubes. All tubes through which the flame and gases of the furnace pass on their way to the stack are properly flues, but the term "tube" is generally applied to drawn or lap-welded tubes, while the term "flue" is used in respect to a built-up flue.

(*b*) The tubular type of boiler is the more economical, because it presents a larger heating surface for the same grate area and gives a greater evaporation of steam per pound of fuel burned.

Ques.—What is the horsepower of a horizontal tubular boiler 5 ft. in diameter, 18 ft. long, containing seventy 3-in. tubes?

Ans.—The horsepower of this type of boiler is commonly estimated as varying from $^1/_{18}$ to $^1/_{14}$ of its heating surface. Assuming that three-fifths of the shell and ends of the boiler is exposed to the flame and hot gases of the furnace, the total heating surface of the two boiler heads, less the area that must be deducted for the seventy 3-in. tubes, is

$$2 \times 0.7854\,(3/5 \times 60^2 - 70 \times 3^2) \div 144 = 16.7 \textit{ sq.ft.}$$

The combined area of three-fifths of the shell, which is 60 in. in diameter, and the cylindrical surface of the seventy 3-in. tubes is

$$3.1416\,(3/5 \times 60 + 70 \times 3)\,18 \div 12 = 1159.3 \textit{ sq.ft.}$$

The total heating surface is therefore 1,176 sq.ft. Then, assuming the average ratio of heating surface to horsepower as 16, the horsepower of this boiler is 1,176 ÷ 16 = 73.5, say, 75 hp.

Ques.—An engine cylinder is 12 in. in diameter and 18 in. long. Find the sectional area and the cubic contents of this cylinder.

Ans.—The sectional area is $0.7854 \times 12^2 = 113.1$ sq.in. The cubic contents of the cylinder is therefore $113.1 \times 18 = 2{,}035.8$ cu.in.

Ques.—In case of imminent danger, supposing the water had fallen below the water gage or the pressure had become dangerously high in a boiler of which you had charge, what would you do?

Ans.—In case the water has fallen below the gage or glass and does not appear in the lowest trycock, open the furnace door and dampen the fire with a few shovelfuls of green coal or ashes. Do not disturb the fire, as this would only increase the heat of the furnace and make the danger the greater.

A dangerously high pressure could only result by the sticking of the safety valve. It is not generally considered well, in that case, to force the safety valve open suddenly. Every effort should be made to reduce the pressure by starting the engine or allowing the escape of steam by any means available. As easily as possible, the safety valve should be released.

Ques.—A boiler is to be run under a pressure of 100 lb. per sq.in.; to what hydrostatic pressure ought this to be tested for safety?

Ans.—The rules of different underwriters vary in regard to the hydrostatic test of boilers. The pressure to which the boiler should be subjected in this test will depend to some extent on the factor of safety used in its manufacture as well as the service for which it is designed. The hydrostatic pressure is sometimes made twice the working pressure of the boiler. At other times a hydrostatic pressure half again as great as the working pressure is employed, and again the hydrostatic pressure when testing a boiler is increased from 80 to 100 lb. above the working pressure.

Ques.—What is piston displacement, and how is it measured?

Ans.—Piston displacement, in engine practice, is the volume of the space passed through by the piston when making a single stroke. It is measured by the product of the sectional area of the cylinder and the length of the stroke.

Ques.—Name and define four important events in the distribution of steam which occur in every revolution of an engine.

Ans.—The four important points in the cycle of a steam engine are the point of admission when the steam port begins to open; the point of cutoff when the steam port is closed to the admission of steam; the point of release determined by the opening of the exhaust port; and the point of compression, which begins with the closing of the exhaust port.

Coal and Coke News

Harrisburg, Penn.

Millions of dollars are at stake in an equity suit now before Judge C. N. Brum at Pottsville.

It is a suit to prevent the board of city trusts of Philadelphia, which has leased the Girard estate coal lands under the city of Shenandoah to the Thomas Colliery Co., from removing the pillars which now hold up considerable of the real estate of Shenandoah.

Half a million tons of coal are in the pillars, the market value being considerable more than $1,000,000. But the safety of several millions of dollars in real estate also hinges on the case. The Home Brewing Co., is the complainant in the case and Archbishop Predergast has also secured leave to intervene, because St. Casimer's Catholic Church valued at $80,000 is in the danger zone and may be affected if the pillars are removed.

The court is called upon to decide whether the mining company shall be made to suffer by reason of prohibition against the removal of the remaining pillars of coal, or whether the surface property owners shall be compelled to run the risk of great damage.

The action is similar to those taken in Scranton and Wilkes-Barre, differing only in detail. The leading question is whether reservation to a mining company which has bought or leased coal and has obligated itself to pay for it, are in the nature of an inviolable contract when mining is conducted in such a way as to imperil life and also vast property interest. The Supreme Court has already decided that where stipulations in a deed are clear, surface property owners have no redress, and that even risk of life cannot be taken into account in a suit to annul a company's right to take out as much coal as it pleases.

In this connection the Supreme Court has said that "Where one person owns the surface and another person owns the coal or materials lying underneath, the under mineral estates owes a servitude of sufficient support to the upper or superincumbent estate. This principle has no application where the same person is the owner of both estates, nor does it apply where by contract between the parties they have covenanted for a different rule. Like any other right, the owner of the surface may part with the right to support, by his deed or covenant.

"Where a conveyance of surface reserves to the grantor the right 'to mine and take away the coal without making any compensation to the grantee, his heirs or assigns, for any effect upon, or injury to the said lot or piece of ground, or the surface thereof, or to the buildings erected thereon in consequence of mining,' the grantee has no right to surface support, and cannot recover for failure to support, even if that has been caused by negligent mining."

Owners and lessees of coal have been so well fortified by the above decision that they contend that the only safeguard is some arrangement with them by which owners of surface property will pay then for the coal that should be left standing. This was, in substance, the principal recommendation made by the Cave-in Commission appointed by Governor Tener several years ago.

It is evident that the only hope of surface owners is that by some extension of the police powers of the state, not yet tried out in litigation, relief may be afforded them, on the ground that no private contract should jeopardize life. There is some hope of securing relief through a municipality's control over public streets and buildings. Along these lines litigation has not yet been carried to the higher courts. The outcome of the suits at Pottsville will be awaited with the keenest interest by the entire anthracite region.

PENNSYLVANIA

Anthracite

Pottsville—The Supreme Court has decided that the office of Mine Inspector is a state position, and candidates must therefore be elected in the even numbered years and not the odd numbered. Accordingly the names of Archie B. Lamb, of Shenandoah, and P. J. Fenton, of Mahanoy City, have been stricken from the ballot. All nominations for this office are now valueless.

Pittston—Something of a novelty was introduced at a recent meeting of the Pittston Mining Institute, at which Mine Inspector Samuel J. Jennings gave an address on "The Practical and Economical Use of Timber at the Mine Face." Demonstrations were given by the use of a wagon-load of mine timber which had been placed on the stage of the meeting room.

Scranton—Three homes on Beech St. were badly damaged by a cave-in of the National mine of the Lackawanna Coal Co. recently. Two of the houses were not in use, the occupants having removed on warning from the company to do so. The other house was badly wrecked, while the two above mentioned were tilted entirely from their foundations.

Shenandoah—The collieries of this region, which have been on a three days a week schedule for several months, have now gone on full time. This is the first time the mines have worked full time since last December.

Hazleton—Of late it has been quite noticeable that the number of miners who desert the mines for the farm is on the increase. Especially is this true of the foreigners who come from agrarian districts in their native land. As soon as they can accumulate sufficient money in the mines to buy a small farm they lay down their tools. The Rush and Quakake valleys in this county are dotted with the farms of the former miners. These men accustomed in the home country, where land is scarce to till the soil up to the very doorstep, are making a success of what have been termed hereabouts worn-out farms.

McDonaldtown—Officials of the Brothers Valley Coal Co. were forced to close down part of their plant at this place on Oct. 14, because of a car famine. It was found impossible to get cars into McDonaldtown. All the available rolling stock had been filled the night before. The car famine comes at a bad time, as the Brothers Valley company has a number of orders which require immediate shipment.

Bituminous

Johnstown—Coal operators in this part of the bituminous field are not seeking war orders to any great extent, but say they have received numerous inquiries of late from Italy and Spain, as well as from South America. One of the chief objections to the foreign orders is said to be that buyers in both Europe and South America expect the shipper to pay the freight and insurance, while the American method has always been to charge the freight to the consignee. Foreign buyers also specify that the coal shall contain no sulphur, and shall be high in volatile matter, conditions which are said to be difficult to meet in this part of the bituminous field. There appears to be a general feeling among the coal men also, that any business gained now in foreign fields will be lost immediately on the conclusion of the war. Some foreign orders have been placed, but they are limited in quantity, and the fields which they affect are not large.

Uniontown—Without a car of holdover coke in the region and agents applying daily for contracts at present rates, coke producers of Fayette county are on the qui vive, anticipating one of the greatest demands for their fuel that has ever been known and at prices which will make up for some of the hard times since 1907. New plants are being fired and old plants, idle from 6 months to two years, are cleaned up and ready to start when the directors give the word. The Emery plant of the South Fayette Coke Co. is running full. Sometime within the next few days the Newcomer Coke Co., will begin operations at its new plant near McClure Station and both the Gilmore and Plumer coke companies are ready to operate at a few hours notice. The former has 102 and the latter 72 ovens available.

Announcement was recently made by the H. C. Frick Coke Co. that 500 additional ovens were fired recently at Bitner, which plant has been idle for more than a year; 200 to 300 ovens have been blown in; 750 additional ovens will be fired at 18 plants shortly, bringing the output of this company to a 90% capacity. The plants affected are Adelaide, Brinkerton, Buffinton, Calumet, Continental, Continental No. 2 Continental No. 3. Dorothy, Hecla, Kyle, Marguerite, Standard, United, York Run, Hostetter, Whitney, Leisenring No. 2, Le Monte and Bitner.

Connellsville—An increase of 20,000 tons per week recently brought the production of the Connellsville region to 418,000 tons. This is the greatest output since the first quarter of 1913.

According to reports the H. C. Frick Coke Co., is still continuing in its efforts to extract valuable products from the sulphurous water pumped from its many mines in western Pennsylvania. The latest attempt is at the Calumet plant near Mount Pleasant where the sulphur-laden water is pumped into a large tank where a churning process is constantly going on, and from whence it will pass through machinery designed to separate the byproducts from the water. These consist of iron oxide, sulphur and other minerals.

MARYLAND

Baltimore—It is stated that the Consolidation Coal Co., since Jan. 1, has mined and shipped coal at the rate of 1,000,000 tons per month. Since Aug. 1 the Consolidation Co. has exported hundreds of thousands of tons of fuel. There now exists a shortage of cars and men, the first being due largely to increased manufacture, while the second is the result of the European war.

VIRGINIA

Big Stone Gap—The coke plant of southwest Virginia are being put in shape for active operations, and it is believed that all of the ovens will be in blast by the first of the year. The most serious problem which the producers have to face is that of labor.

WEST VIRGINIA

Moundsville—As soon as the special receiver was appointed for the Mound City Coal Co., men were put to work cleaning up the mine ready to start operations. It is hoped that this mine will run steadily with a considerable number of men. The Dollar Saving and Trust Co. of Wheeling is the special receiver.

Within the next few days work will be started to increase the capacity of the railroad switch at the Rail and River coal mine No. 3 at Big Run, near this city. The present switch has a capacity of about 22 gondolas, the additions will give a capacity of about 50 cars, so that the mine can be worked full time whenever orders for the entire output can be secured.

Charleston—It is reported by the Department of Mines that 13 out of the 32 fatalities due to accidents occurring in in the mines of West Virginia during September took place in McDowell County. Of the remaining 19 fatalities four occurred in Fayette County, five in Raleigh, two each in Harrison and Logan counties, and one each in Brooke, Marion, Mercer, Mingo, Ohio and Tucker counties. Ninteen deaths were due to falls of slate and coal. Mine cars killed six men, locomotive, two, electricity, three, and monitors, one.

Pocahontas—It is estimated that the Pocahontas field has been affected less through foreigners answering the call to arms in Europe than any other coal field of the state. It is said that throughout the Pocahontas field virtually no shortage of labor exists, while this has become a serious problem in some of the other coal fields.

OHIO

Bellaire—The Lansing mine of the Lorain Coal and Dock Co. started work recently after being idle for 19 months. When working full this mine employed 400 men, about half that number being now at work.

Cincinnati—Members of the Ohio Coal Operators' Association have been informed of the decision of four railroads handling coal shipments from south of the Ohio river to increase the differential in favor of Ohio, in order to meet the objection of the Ohio men that they could not compete with West Virginia and Kentucky coal in the markets of the West and Northwest. The railroads affected include the Chesapeake & Ohio, the Louisville & Nashville, the Baltimore & Ohio and the Queen & Crescent.

INDIANA

Linton—Operations have been resumed at the Little Giant mine after several weeks' idleness. Three hundred men are employed.

Columbus—The Columbus Chamber of Commerce has filed a petition with the public service commission at Indianapolis against railroads connecting the Columbus territory with the coal fields of Indiana in which it is declared that discriminatory rates on coal to Columbus manufacturers has kept many of them from making needed extensions to their factory properties, even though the stimulus of the European war has been felt in many industries there. The commission is asked to make an order reducing and equalizing rates on coal for manufacturing purposes. The Central Indiana Ry. Co., Chicago, Terre Haute & Southeastern R.R., Cleveland, Cincinnati, Chicago & St. Louis, the Illinois Central, Lake Erie & Western, Pittsburg, Cincinnati, Chicago & St. Lous and the Vandalia railroads are complained of in the petition.

Sullivan—Joseph Weatherly, fire boss at the Peerless mine, has invented a roof support for entries and air courses. By his plan, coal is overcut by an adaptation of the topcutting mining machine, arranged to form a curved kerf at the elevation of the roof. When the coal below the kerf is removed, that above it forms a roof-supporting arch of sufficient depth at the ribs to hold the overlying stratum and with enough thickness at the middle to protect the slate from air slacking.

ILLINOIS

Witt—The three large coal mines at this place were closed Oct. 13 for an indefinite period, throwing 600 men out of work. Many of the miners are preparing to leave here and seek homes and work elsewhere.

Springfield—Every 320,000 tons of coal mined in Illinois for the year ending June 30, 1915, cost one life, according to the report of the Illinois Mining Board. One hundred and eighty men were killed while employed about the mines. Of these 176 met death underground. Serious injuries totaled 1013. A total of 75,607 men were employed in the 779 coal mines of the state. These mines produced 57,601,694 tons, of which 56,173,176 tons came from 281 shipping or commercial mines. The number of mines in operation was 16 less than the previous year. One hundred and twenty-three new mines were opened during the year and 139 were closed or abandoned. Of the output 11,100,890 tons was delivered to locomotives at the mines, 41,461,218 tons was shipped and 2,000,000 tons was used or wasted at the mines. Five hundred and eighty-two motors and 1,708 machines were in operation and the machine-cut coal totaled 34,037,426 tons against 23,564,268 tons mined by hand. The average price paid per gross ton for hand mining was $0.52. To blast this coal 1,106,786 kegs of powder were used.

Mt. Olive—Operators of the standard field in Illinois are no longer required to shut down on "Virden day" or pay a fine. Annual memorial services for the four men killed in a strike riot at Virden 15 years ago this month are still held by the miners, but the prohibition against work on that day in the inner group of mines has been lifted.

IOWA

Des Moines—With the advent of frosty weather the coal mines in and about Des Moines are putting on larger forces of men and within another 4 to 6 weeks, will be running full capacity. According to reports coming in to the state mine inspector's office, all of the mines in the state are taking on more men.

Notwithstanding the fact that its mines are being worked out and the consumption of coal is increasing, Iowa has enough coal to last 2,500 years, according to geology experts. Mr. Campbell of the Geological Survey has estimated that the original coal supply of Iowa was 29,160,000,000 tons. From 1840 to June 30, 1914, the amount of coal mined in the state, according to the records of the state mine inspector's office, was 182,612,952 tons.

COLORADO

Denver—Owing to the fact that there promises to be a steady growth in the buying of soft coal for export, soft coal conditions in Colorado have already reached a point 100 per cent. above normal. Colorado coal will probably not be exported to any extent, but domestic markets which may be reached from this point will be fed from Colorado.

WYOMING

Kemmerer—It is stated that the Cumberland Mines now have an output of about 2,000 tons per day with 400 men on the payroll. Prospecting has been carried on for some time past on the west crop of the Cumberland seam, some distance from the present mine. It is understood that the prospects in Uinta County are sufficient to warrant the company in opening a new mine, and a force of men will shortly be put to work driving a slope. This will be on an 8-ft. bed of the same coal as is now being worked.

FOREIGN NEWS

Toronto, Ont.—A receiver and manager of the Inverness Ry. and Coal Co., of Nova Scotia, has been appointed by the court on the application of the National Trust Co., Ltd., trustees for the bondholders. This action was recently decided upon at a meeting of the bondholders at which 50% of the outstanding bonds were represented. A bondholder's committee was appointed to advise the trustees respecting any matters which may arise in connection with the receivership. It is expected that the operations of the company will meet working expenses during the continuance of the receivership.

PERSONALS

Lyell Buttermore, payroll clerk at the Coldbrook plant of the H. C. Frick Coke Co., has been transferred to a similar position at Bitner.

B. C. Price, of Kingston, Penn., for 26 years an employee of the Lehigh Valley Coal Co., has resigned his position as chief clerk of the Wyoming division, to accept a position with the Hudson Coal Co. as chief accountant for the Wilkes-Barre division.

P. J. Rogers, president of the Alabama state convict board is visiting the coal producing counties of the state to familiarize himself with coal mining, as he is planning to work state convicts in the development of coal lands owned by the University of Alabama at Tuscaloosa.

Earle A. Henry, chief of the West Virginia Department of Mines, recently conducted examinations at Mt. Hope, where 76 men were examined for the positions of mine foremen and firebosses. Fifty-two of this number were given practical gas tests in a mine as part of their examination work.

James Cole Roberts, mining engineer in charge of the United States Bureau of Mines at Denver, Colo., has resigned that position to accept the professorship of the newly created chair of Safety and Efficiency Engineering at the University of Colorado, at Golden, Colo. He will assume the duties of his new position about Nov. 15. His successor with the Bureau has not been named.

Thomas E. Ashman, veteran coal miner of Des Moines, Ia., has just inherited $80,000 from a distant relative, of whose existence he was never aware, but is still working in the mines. Ashman received the good news calmly. He has a wife and one daughter and is paying for a home in monthly installments. He is one of three heirs to the estate of a Mr. Belinsky, Russian banker, who died recently in England leaving a fortune of £48,000.

Henry T. Bardeleben, president of the W. G. Coyle Coal Co., of New Orleans, has signed an order giving 15 days' extra pay to every employee of the company. The bonus is for the splendid services performed by the employees during the hurricane that struck the port Sept. 29. The company's loss in the storm was virtually $30,000; but would have been much more had it not been for the courage and coolheadedness of a number of the company's employees.

OBITUARY

Charles Klepser, a mining engineer 25 years of age, was killed on Oct. 15 by a fall of coal in a mine at Portage, Cambria County, Penn.

Harry W. Errett, 46 years of age, secretary and treasurer of the Troll Coal Co., of St. Clairsville, Ohio, died recently at his home in that city.

Joshua William Alder, well known in the coal trade of the country and for years engaged in the publication of maps and compilation of statistics relating to the coal industry, died recently in Muncy, Penn. at the age of 84 years.

Enoch Garver, aged 60, a mine inspector, died Oct. 18, in a hospital in Charleston, W. Va., as a result of injuries received in the Sunday Creek Coal Co.'s mine at Longacre some time before when a coal car jumped the track crushing him against the rib.

James Kennedy, a member of the Miners' Certificate Examining Board died in Pottsville, Penn., recently after a lingering illness. He was formerly a fire boss at the Blackwood colliery and was prominent in mining circles throughout the region. He was 48 years of age.

W. H. Motter, of Denver, Colo., a man who is well known as a successful inventor of mining machinery died recently at the home of his daughter Mrs. T. P. McAndries after a short illness. He was a veteran of the civil war and a member of the Grand Army of the Republic. He leaves a large circle of friends.

John J. Doherty, a well-known mine foreman, died at his home recently at Latrobe, Penn. For three years Mr. Doherty has suffered from cancer, but prior to his retirement from active life he was connected with a number of coal mines in that section. Mr. Doherty was 51 years of age, and is survived by four children.

INDUSTRIAL NEWS

Des Moines, Iowa—The Maple Block Co. is opening a new field on the Addison Parker farm, north of Des Moines.

Pittsburgh, Penn.—The Consolidated Coke Co. of Uniontown has absorbed the Pickands-Magee Co. of Pittsburgh.

Gadsden, Ala—It is reported that the Gulf States Steel Co. will spend in the near future approximately one million dollars in improvements and additions to its plant.

Boswell, Penn.—One of the most valuable coal tracts in Somerset County known as the George Reiman tract located in Jenner Township has been sold to the United Coal Co. This tract contains 128 acres of coal.

Whitesburg, Ky.—It is announced that the Mineral Development Co., of Philadelphia, will make two coal developments along Colly Creek a few miles above this city, the initial work to start within the next 60 days.

Charleston, W. Va.—A deed was recently recorded showing the transfer of somewhat over 1,000 acres of coal land on Cabin Creek in Kanawha County, from the Williams Coal Co. and the Cabin Creek Kanawha Coal Co. to the Shonk Land Co.

Cresson, Penn.—It is stated that due to the general increase in business, a number of mines in this section which have been idle for more than a year are now being put into condition to be operated to full capacity. Other mines now operated will be speeded up to fill orders now coming in.

Cincinnati, Ohio—The United States Circuit Court of Appeals has decided against the Marmet Coal Co. in its appeal against a judgment in favor of the People's Coal Co., of Pittsburg, for $12,000 as balance of the purchase price due on 55 coal barges purchased by the Marmet company in May, 1911.

Washington, D. C.—Tariffs of the Central R.R. Co. of New Jersey, proposing payment of allowances to the Lehigh Coal and Navigation Co. out of its freight rates on anthracite coal from Hauto and Nesquehoning, were recently ordered canceled by the Interstate Commerce Commission. Such allowances were held to be unlawful by that body.

Pittsburgh, Penn.—It has been reported that a resurvey of the property of the Pittsburgh Coal Co. has been made and that most of the stock recently bought has gone into the hands of affiliations of the Midvale Steel Co. It is said that the Pittsburgh Coal Co. will henceforth be closely connected with the Midvale Steel Corporation even though it is not actually absorbed thereby.

St. Louis, Mo.—The meeting of the St. Louis Coal Club which was to have been held Oct. 18 has been postponed to Oct. 25. The principal speaker of the evening will be C. N. Talbert, director of streets and sewers. He will tell the coal men what his department has to contend with on account of overloaded coal wagons, etc.

Chester, Miss.—It is said that in the vicinity of Reform some 12 miles north of this place, a coal measure has been found, and it is believed that mining upon a more or less extensive scale will be attempted before the end of the present year. A coal company has been formed, and various purchases and leases made.

Clearfield, Penn.—H. P. Dowler has purchased the Fayette Coal Co.'s mining plant and property at Dola, W. Va. This property consists of approximately 1,250,000 tons of coal in the seam and a well equipped mining plant. It is the intention of the purchaser to improve the property and operate with an output of 1,000 tons per day.

Springfield, Ill.—The Public Utilities Commission of Illinois took up recently the complaint of the Southern Coal, Coke & Mining Co. against the Vandalia and Southern railways companies. The complaint is based on the refusal of the Vandalia to establish through routes and joint rates on coal from the mines on the Southern Railway to points on the Vandalia line.

Waynesburg, Penn.—Large payments on Green County coal acreage were recently made in Waynesburg by the Cleveland Cliffs Iron Co., of Cleveland, Ohio. Three mortgages for $90,000, $12,000 and $235,000 were satisfied. These were respectively to Mrs. Mary Hawkins, Sarah McClenathan, and

Rex Moredock, of Jefferson, and to J. V. Thompson and associates of Uniontown.

Belaire, Ohio—It is stated that the George M. Jones Coal Co. will probably construct a new tipple for its pultney mine unless plans can be devised to equip the old one with proper scales and machinery. While the new tipple is being erected, the miners employed at Pultney will be transferred to the Webb mine which in the meantime will be placed in shape to resume operation.

Youngstown, Ohio—The American Tar Products Co., which operates a plant at Crab Creek, Ohio, has completed negotiations with the Republic Iron and Steel Co. for the tar products from the new by-product ovens of the latter company, 75 in number, which will be completed in a few days. The tar products company may have to extend its plant in order to take care of the new material.

Birmingham, Ala.—Owing to the improved pig-iron market, several of the largest iron producers of the district are repairing and will soon put into blast additional furnaces. The present price is the best obtained for several years, and the make for September was the largest in the same length of time. Stocks on hand are being rapidly reduced and it will be necessary to put additional furnaces into blast to take care of orders.

Cincinnati, Ohio—The Ulland Coal Co. has filed a complaint with the Interstate Commerce Commission claiming reparation from the Louisville and Nashville R.R. Co. on numerous coal shipments from Kentucky and Tennessee mines to the company's Hunt St. station in Cincinnati. It is claimed that the revision of Apr. 15 advanced the rate to an unreasonable extent as compared with other points in the Cincinnati district.

Philadelphia, Penn.—This port continues to show a big increase in coal shipments over the piers. For the period of nine months ending Sept. 30 there were 792,600 tons of bituminous coal loaded as compared with 480,336 for the same period last year. The anthracite tonnage also showed a good increase with 51,583 tons as against 41,861 tons. The total value of all shipments is placed at $2,705,115, compared with $1,571,293 last year.

Birmingham, Ala.—C. H. Nesbitt, state mine inspector, asserts that the coal production in the state during the present year may be 16,000,000 tons, and may even go higher. The output from the larger mines to supply the metal industries has brought the figures up to this satisfactory output. There is agood demand for coke, and the starting of a number of beehive coke ovens shortly will mean a further need for coal before the end of the year.

Philadelphia, Penn.—The Philadelphia and Reading Ry. coal barges "Tunnel Ridge" and "Coleraine," which foundered in a storm off Provincetown, Mass., recently have been stripped of their fittings and the hulls burned, so as to remove the possibility of their becoming a menace to navigation, as it was declared impossible to float them. The "Manheim," which went ashore at the same time, is in such a position that it is thought likely to float her.

Denver, Colo—It was rumored in Denver that the corporation of E. I. Du Pont de Nemours & Co., whose domicile is in Delaware, has obtained an option on the common stock of the Colorado Fuel and Iron Co. It was further said that the Pueblo plant of the Colorado Fuel and Iron Co. would be turned into an ammunition factory, in conjunction with the Midvale Steel Co., which the Du Ponts and W. E. Carey are said to have just acquired. The rumor has been denied.

Wheeling, W. Va.—Attachments for sums aggregating $49,233 and covering 11,450 acres of coal lands near here have been filed against J. V. Thompson, of Uniontown, Penn., whose affairs have been in litigation for nearly a year, following the closing of the First National Bank of Uniontown. The attachments were filed on behalf of William T. George, J. R. Barnes, Robert E. Umbel, John Brown and Samuel Woodward, all of whom allege that they hold notes against Thompson.

Belleville, Ill.—R. W. Ropiequet, attorney for the St. Louis Coal Traffic Bureau, has filed with the Public Utilities Commission of Illinois a petition for a rehearing in the Illinois coal rate case which was recently passed on by the commission. The railroads were permitted by the commission to put into effect a new coal rate into the East St. Louis market, increasing the rate from 32c. to 37½c. a ton. The rate had been suspended for several months while the operators and the City of Belleville tried to have the suspension made permanent.

Birmingham, Ala.—The first shipment of coal to be made by barges on the Warrior River by the De Bardeleben Coal Co. was recently loaded at Cardova. There are now three large companies using the Warrior for barging coal to Mobile and New Orleans. The Tennessee Coal, Iron and R.R. Co. is shipping 10,000 tons of coal per month to New Orleans. The Pratt Consolidated Coal Co. ships more than a thousand tons per week, and the De Bardeleben Co. has a contract to furnish the United Fruit Co. at Mobile with 40,000 tons of coal during the present fiscal year.

Clearfield, Penn.—The Pennsylvania Public Service Commission has issued an order dividing between interested railroads the revenues for hauling coke from the Gallitzin, Connellsville, Clearfield and other fields to the plants of the Lehigh Fire Brick Works, Bryden Horse Shoe Co. and the Crane Iron Works at Catasauqua. The case was heard last winter and attracted wide attention because of the questions involved. The new order decides that the Lehigh and New England R.R. shall receive 33c. out of the revenue on each ton of coke and the Pennsylvania and Lehigh Valley railroads will receive the balance.

Columbus, Ohio—The Chesapeake & Northern Ohio Ry. Co. has asked the Public Utilities Commission for authority to increase its capital stock from $50,000 to $3,450,000 and to issue $1,000,000, 5 per cent. 30-year gold bonds. Proceeds from the sale of the securities are to be used in taking up present floating indebtedness. The company reported that in building its new line from Portsmouth to Columbus it has already spent $1,354,000 and expects to spend $3,264,000 additional to complete the line. The Hocking Valley Ry. also applied to the Utilities Commission for permission to issue $4,000,000, 2-year 5-per cent. gold notes to refund an equal amount of 6-per cent. notes, due Nov. 1.

Denver, Colo.—A suit has been filed with the state public utility commission by the Grand Junction Mining and Fuel Co. and also by the Palisade Coal and Supply Co. to compel the Denver and Rio Grande R.R. to give better rates in Mesa County, Colorado, where the railroad carries coal from the Cameo mines. They also attempt to force the railroads to make a publication of tariffs for coal rates from Denver to Salida. The petitioners allege that the rates are unfair and unjust and that furthermore the rates charged from Bowie, Somerset and Crested Butte and from Thompson, Utah, are so heavy that it is impossible to compete for the business of Denver or other cities in eastern or central Colorado.

Cincinnati, Ohio—The annual meeting of the Kanawha Coal Operators' Association, of West Virginia, was held here on Oct. 15, one of the chief matters of business taken up being that of the proposed change in rates from West Virginia mining points to the West. The association determined to engage counsel to appear before the Interstate Commerce Commission on its behalf, together with counsel for other West Virginia operators. No action will be taken, however, until the proposed rates are filed to become effective. Col. E. O. Dana, of Cincinnati, was reëlected president of the association, T. J. Hatfield, of Covington, Ky., being elected vice-president. The executive committee consists of Frank O. Harris, chairman; Michael Gallagher, John H. Winder, S. B. Stewart, J. W. Dawson, G. H. Powell and Edw. Schonebaum.

Denver, Colo.—N. S. Walpole, owner of a quarter section of state land in Routt County has entered suit in the district court of Colorado to enjoin the state land board from granting to George Morrison a 5-yr. mineral lease upon his land with the right to mine for coal. The surface rights of the land are worth only $16,000, but since Walpole acquired the land a big vein of anthracite coal has been discovered estimated to be from 6 to 8 ft. thick. The state gets a royalty of 10c. on every ton of coal mined under the state laws and it is estimated that the school fund would receive about $550,000 if the clause which is included in every sale certificate that the state reserves all mineral rights is upheld in the courts. This is, of course, a test case. Last May an application was made by Morrison to the state board for mineral rights.

Benton, Ill.—A New York syndicate has employed several men to conclude the purchase of a large coal field in Southern Illinois. The deal will comprise from 300,000 to 400,000 acres of coal land in the counties of Saline, Hamilton, White, Gallatin and Franklin, and means an expenditure of $20,000,000 in those counties and probably the building of several railroads. The Louisville & Nashville R.R. Co. for the past few months has had engineers investigating the route for a railroad running from Evansville, Ind., by way of Ridgway and Equality, Ill., through Horseshoe Gap, tapping the coal and mineral belt of Hardin and Pope counties and connecting with the bridge that is now being constructed at Metropolis. The opening of this great field will necessitate the building of many other railroads to handle the large output which will be exported by a New York company.

Coal Trade Reviews

General Review

Anthracite trade even better than anticipated. Heavy movement of bituminous on contracts. Vessel shortage and improved local conditions cause slump in exports. Lake markets strong. Middle West unusually brisk.

Anthracite—Mine operations are now on a full time basis, and the market has stiffened up, probably even beyond expectations of the more conservative members of the trade. The car and labor supply are slowly becoming the controlling factors; shortage of special kinds of equipment, particularly for shipment to the West, is causing anxiety as regards the future. Concessions on the regular circulars are confined to unusual situations where it is necessary to move tonnage, and this in spite of the fact that there is a well defined effort noted in many directions to establish new high selling records. Unsold coal at tidewater is practically all cleaned up, and there is an excellent movement in the coastwise trade. Lake shipments are only fair.

Bituminous—A progressive improvement still characterizes the soft-coal trade, though the increased demand is confined essentially to extra requisitions on contracts. Forehanded consumers are now beginning to accumulate all the surpluses of the high-grade fuels they can carry, though prices generally have not responded to the improved tone, with a possible exception of a greater firmness. Manufacturing demand is steadily expanding, and even the more conservative members of the trade are notably optimistic. Car shortages are becoming more frequent, and this is causing much concern over the outlook for a month or two later; an encouraging aspect of the transportation problem is the effort being made to rush new equipment into service with the utmost dispatch.

Exports—Foreign shipments have fallen off at a pace equalled only by the recent spectacular increase. The accumulation at exporting piers is substantially above normal, and unless the balance of the month is characterized by an unexpected and notable increase, the October record will show up poor. The acute shortage in vessel tonnage is the principal cause of the decline, though the improvement in the local market and the exacting conditions defined by foreign buyers are also contributing factors. Vessel rates are not so high as last week but tonnage offering is eagerly mapped up to cover numerous orders.

Lake Markets—Demand from the steel industry, consumption in which has been up to the maximum capacity for the past several weeks, has taken another spurt due to stocking operations against possible future emergencies. It is a significant fact that the customary depression that characterizes the approaching close of Lake navigation, is entirely absent. The car shortage is steadily developing to greater proportions and is having a notable tendency to stiffen prices, conservative buyers coming into the market for surplus tonnages. Confiscation of coal by the Pennsylvania R.R. is also an important development of the week. Retailers stocks are only fair as a result of the light buying through the summer, and the cooler weather, with the consequent rush of orders from domestic consumers, has resulted in greater buying from the mines. The Southern market is substantially better than for some time, particularly as regards the movement on contract but there is still considerable room for improvement.

Middle West—The domestic trade is unusually brisk, steam business has improved, rush orders are more frequent, and there is evidence of the demand outstripping the production. Receipts at the upper lake docks are larger than last week, and shipments to interior points are substantially greater than during this time last year. Restrictions governing the use of coal cars are becoming more frequent. Railroads continue buying actively and production is at a relatively high level. Evidence of the better conditions prevailing is seen in the firmer attitude retailers are taking as regards credits. Some producers are already falling behind on contracts.

A Year Ago—Anthracite trade slowing up due to the warm weather, and concessions on the circular are freely offered. Further restrictions and cancellations are the features of bituminous. Practically no spot demand.

BUSINESS OPINIONS

Bradstreet—Trade expands at a speedier pace, and reports, especially from the eastern half of the country, are more satisfactory than for three years past. Activity in industries, many of which are sold far ahead, is accompanied by stiffer commodity prices, broader distribution by jobbers, good sales by retail dealers, enlarged road orders, increased railway traffic, improved commercial demand for money, plethoric supplies of funds, largely increased bank clearings, better collections and reports that many houses have increased their traveling forces. Stocks of staple wearing apparel at practically all points are light, the result of long-practiced conservative buying, and the uplift in trade seems to have developed a rush to cover requirements.

Dun—With cross currents diminishing in force, the tide of business is rising at an accelerated pace and an era of widespread activity is in prospect. Usually during a transition period gains are recorded slowly, but strictly mercantile conditions have passed the stage where progress is difficult of discernment, and of late industrial expansion has been phenomenally rapid. Reports from nearly all sections of the country tell of the unchecked growth of new enterprise, which, while manifest in varying degrees in different lines and localities, is everywhere stimulated by the exceptional strength of the fundamental situation. Assurance of agricultural success, together with almost unlimited financial resources, has given the commercial world the confidence essential to the development of national prosperity.

Marshall Field & Co.—Current wholesale distribution of dry goods shows considerable increase over the corresponding periods of the past two years. Buyers continue to come to market in much larger numbers. Collections are about normal. The cotton market is strong with continued advances and the trade in domestic cotton cloths is fairly active. The raw silk market has also shown considerable advance during the week anl still has a strong upward tendency. Finishers of cotton and silk goods have advanced their prices considerably the last few days.

Boston News Bureau—The general situation is assuming a more stable position. There is less sensational speculation and more legitimate operation. The credit departments of almost every bank say that their reports from general trade are highly encouraging. There is more activity in every line of trade and this is beginning to apply to luxuries as well as to necessities. But with all this, money is accumulating. Domestic business has not reached that stage as yet where credit is needed, and interests devoting their time to war business receive 25% of the amount involved when they take the order. Gold continues to dribble this way all the time to pay for war supplies, and this will continue.

Southern Lumberman—Advances in quotations on yellow pine are being made with such frequency by most of the larger mills that it has become increasingly difficult during the past week to ascertain the latest prevailing prices. In fact, the market is subject to spottiness, due to these advances, and the prices secured for any item are determined largely by the stock which a mill has on hand and the promptness with which it is able to make delivery. Reports of greater volume of business in hardwoods and at somewhat better prices are received this week. Not only is there increase in the business of the current week, but inquiries are decidedly more numerous, and though in most cases single orders are for small lots as compared to the character of business in normal times, they are being received with sufficient steadiness to accumulate a far more satisfactory aggregate than at any previous time in the past eighteen months. While the market has during that time been subject to numerous fluctuations due to the changing aspect of international affairs, to unforeseen increases or decreases in demand for certain woods, the regularity with which the present business is being secured is proving most gratifying to manufacturers and dealers alike.

ATLANTIC SEABOARD

BOSTON

Better demand on contracts but no improved spot market as yet. Some contracts already closed for 1916. Georges Creek steady, but Pennsylvania grades show an upward trend. Water freights unchanged. Anthracite trade satisfactory.

Bituminous—While the Pocahontas and New River situation shows a distinct improvement this week at Hampton Roads the extra demand from this market has been confined to contracts. Several large textile mills have resumed full time and coal receipts are perceptibly larger. There is a good deal of talk about car shortage and its effect a month or two hence, but so far practically no spot business has developed. There is so much coal offering that buyers are not much impressed as yet by any prediction of scarcity.

Prices for inland delivery continue fairly strong considering the light demand. On the strength of recent efforts to place coal for the year beginning next April an amount of contract business has already been closed, but in almost every case with the merchant or agency having the business this current year. The price is understood to be a "sliding" one, up or down from $2.85 f.o.b. Hampton Roads according as the market turns. In other words, those who place contracts now are simply availing themselves of a very low charge for putting the coal on cars at Boston piers.

Georges Creek is still in ample supply at the loading ports, but far-sighted patrons of this grade are taking on what they can store in anticipation of shortages later. Usually this coal is the very first to feel a pinch. Prices so far are unchanged, and shipments are coming forward with usual regularity.

In the Pennsylvania grades there has been somewhat of a spurt the past week, particularly f.o.b. Philadelphia. Prices have hardened generally and on some of the favored coals there have been advances of 5@10c., that is, for shipment to New England. Some of the agencies are quite bullish in tone, attributing much to a shortage of labor in all the regions along with a shortage of cars and the possible suspension next April. New England has not as yet responded to this opinion and probably will not to any degree until Hampton Roads coals begin to advance in price, should that be the case.

Water Freights are unchanged this week from Hampton Roads, 80@85c. being the basis to Boston on boats of 3,000 tons upward. For New York loading for Fall River and New Bedford the current rate is firm at 50c., an advance of 5c. over a week ago.

Anthracite trade is brisking at wholesale. "Indian summer" is having its effect on retail demand, but good business is just ahead. Shippers with supplies of broken and the steam sizes have no difficulty making sales. The hard-coal situation all along the line is in wholesome shape probably for the balance of the season.

Bituminous quotations, f.o.b. loading ports at points designated, are about as follows per gross ton:

	Philadelphia	New York	Baltimore	F.o.b. Mine
Clearfields	$2.25@2.75	$2.55@3.00	....	$0.95@1.50
Cambrias and Somersets	2.45@2.95	2.70@3.20	....	1.20@1.65
Georges Creek	2.92@3.02	3.22@3.32	$2.85@2.95	1.67@1.77

Pocahontas and New River prices, on cars Boston, are $3.55@3.73; Providence, $3.50@3.68, and f.o.b. loading port at Hampton Roads, $2.80@2.85.

NEW YORK

Movement on contracts heavy. Car and labor supply short. Exports decline. Concessions on anthracite practically eliminated. Mines on full-time schedules.

Anthracite—Trade during the week has shown further strength. Sufficient orders are in hand to keep operations going at full time. Notwithstanding, what is considered normal output is not easily obtained due to the shortage of labor. While demand has grown, labor supply has decreased due to the exodus of many foreign miners to their native countries and to take better paying positions with many of the steel and munition plants that are in a position to offer fancy wages. The car supply has also been short in some instances. Some of the companies that ship coal all-rail West at this season of the year are hindered at this time because of the short supply of box cars. Lake demand is good and these shipments are being made in the ordinary open coal cars.

Concessions in prices on domestic sizes are now rare and do not amount to more than 10 to 20c. a ton, as against 40 to 50c. during the dull summer season. Moreover, the cuts do not affect all sizes as was formerly the case. Now individuals are exacting premiums of 10c. a ton in some instances where coal is badly needed and buyers urge prompt shipments. Steam sizes continue very active, with supply decreasing for spot market needs.

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$5.05		$5.10	
Egg	5.30	$5.20@5.30	5.35	$5.25@5.35
Stove	5.30	5.20@5.30	5.35	5.25@5.35
Chestnut	5.55	5.30@5.55	5.60	5.40@5.60
Pea	3.50	3.25@3.50	3.55	3.50@3.55
Buckwheat	2.75	2.25@2.75	2.80	2.25@2.80
Rice	2.25	1.85@2.25	2.30	2.00@2.30
Barley	1.75	1.50@1.75	1.80	1.75@1.80

Bituminous—Contract requirements of bituminous are very heavy. The coke plants are calling for more coal than at any time in recent years, while many of the large manufacturing plants, some of which are now running day and night on war orders, are large consumers. Many small plants are coming into the market for fuel, and in the aggregate the demand is larger than it has been in many months. Export business is falling off because steamers are scarce, while bunker demand is improved because of the heavy movement of cargoes through all of the Atlantic ports.

Car supply was very bad last week on both Baltimore & Ohio and Pennsylvania lines. While there was a fair supply on Monday at many of the Pennsylvania mines, operators did not expect the supply to hold up for more than two or three days. Complaint is heard that some of the roads are not moving coal promptly when it is loaded; this is due to the heavy tax on motive power brought about by the heavy movement of all kinds of war munitions and the crops to the Eastern seaports. Slack has advanced in all regions.

Current quotations f.o.b. New York tidewater per gross ton are on the following basis:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.20@3.30	$3.20@3.30	$3.20@3.30	$1.75@1.85
Georges Creek Tyson	2.95@3.00	2.95@3.00	2.95@3.00	1.40@1.45
Clearfield:				
Medium	2.65@2.80	2.65@2.80	....	1.10@1.25
Ordinary	2.65@2.70	2.65@2.70	....	1.10@1.15
Broad Top Mountain				1.10@1.45
Cambria County:				
South Forks	2.90@3.05	....	....	1.35@1.50
Nanty Glo	2.80@2.85	....	....	1.25@1.30
Barnesboro	2.65@2.70	....	....	1.10@1.15
Somerset County:				
Quemahoning	....	2.80@2.90	2.80@2.90	1.25@1.35
Medium	2.65@2.70	2.65@2.70	2.65@2.70	1.10@1.15
Latrobe	2.55@2.65	....	....	1.00@1.10
Greensburg	2.85@2.90	....	....	1.20@1.25
Westmoreland	3.20@3.30	....	....	1.40@1.50
West Virginia Fairmont ¾		2.70@2.80	2.70@2.80	.90@1.10
Fairmont mine-run		2.60@2.70	2.60@2.70	.80@ .90
Steam		2.55@2.60	2.55@2.60	1.00@1.05
Western Maryland		2.35@2.40	2.35@2.40	.85@ .90

PHILADELPHIA

Anthracite has good week with large orders. Car supply interferes. Stove leads as usual with egg fair and nut very weak. Pea strong at $2 and tax and buckwheat in good demand. Bituminous trade good. Railroads try to relieve car shortage with new equipment. Export quiet.

Anthracite—It is gratifying to record another active week. While the activity is apparent in the city trade, it is particularly true of the extensive surburban districts where shipments have been quite up to, if not beyond expectations. While the dealers are criticizing each other for not maintaining the prices, they are only following the example of the shipper for the past six months. Even now cheap coal is coming into the market, but probably in egg and chestnut sizes only. However, this causes no particular worry as there is always some coal sold off for some reason.

With the increase in business this week the car supply trouble has been greatly accentuated. Many companies are reporting extra large orders on the books and are prevented from making full shipments because of the lack of cars. This would not be so bad if there were any prospects of an early relief, but the general impression instead is that the situation will be worse as the season progresses. But even at that a number of companies are already claiming records for October.

Stove coal has been scarce among some shippers and free with none. Chestnut improves slowly, in fact, so very little that by some it is considered almost hopeless for some months to come. Egg coal is still dragging and causing the individuals, especially, some annoyance to get it off their hands without car service. Pea coal is strong at $2 and tax and some very large sales are recorded this week at that price, while a number of the companies are experiencing trouble to fill all orders. The price may advance, but as yet there has been no real sign of it.

Of the steam sizes buckwheat continues in fair demand, with rice just about the opposite. However, there is considerable storing of both sizes going on in the city at this time. Collections are in good shape; the large companies especially refuse to complain and are greatly pleased with the improvement shown the past few weeks. Good tidewater shipments of anthracite have again gone forward this week.

The circular prices per gross ton for line and Port Richmond shipments, but which do not include the state tax, are as follows:

	Line	Tide		Line	Tide
Broken............	$3.50	$4.75	Pea...............	$2.50	$3.25
Egg...............	3.75	5.00	Buckwheat.........	1.25	2.25
Stove..............	4.00	5.00	Rice...............	.85	1.75
Chestnut...........	4.15	5.25	Barley.............	.50	1.50

Bituminous—A number of large orders have been placed the past week and there does not seem any doubt now that the long expected boost is really here. The export trade is slowing down, as will be noted by the few charters that have been recorded lately. Since the domestic business picked up many shippers have ceased in their efforts to secure foreign orders, although representatives from various governments are in the city making inquiry almost daily. However, very little new business is being placed because of unusual conditions applying to this trade which the American shipper does not seem inclined to meet in the face of good business at home. The prices last week in the local market remained practically on an even keel and the following represents a fair average:

Georges Creek Big Vein..	$1.70@1.80	Fairmont gas, ¾.........	$1.25@1.35
South Fork Miller Vein..	1.55@1.65	Fairmont gas, mine-run..	1.10@1.20
Clearfield (ordinary).....	1.15@1.25	Fairmont gas, slack......	.75@ .85
Somerset (ordinary).....	1.10@1.20	Fairmont lump, ordinary.	1.05@1.15
West Va. Freeport.......	.95@1.05	Fairmont mine-run......	.95@1.00
		Fairmont slack..........	.70@ .80

BALTIMORE, MD.

Labor and car shortage forcing many producers from the open market. Exporting below recent standards.

Labor shortage is restricting productions and car shortage is also interfering with shipments. With the demand growing steadily more coal men are forced to withdraw from the open market. Not even urgent contracts are being taken care of as desired. Export trade has fallen below recent standards. Last week the total shipment on foreign account was but 20,234 tons.

Anthracite men would be content if they too could get through coal as desired. Less embarrassment is felt, however, than with the bituminous trade, due to liberal yard supplies on hand.

The bituminous market is gradually stiffening. Car shortage was again a very apparent factor. Prices were firm at the following figures:

	Mines	Balt.*	Fairmont	Mines	Balt.*
Geo. Crk. Big Vein	$1.75	$2.93	Ordinary mine run	$0.90	$2.28
Geo. Crk. Tyson...	1.40	2.58	Ordinary ¾.......	.95@1.00	2.43
Clearfield.........	1.25	2.43@2.48	Ordinary slack....	.75@ .80	2.08
South Fork...	1.40@1.45	2.63	Low sulphur mine-run............	1.15@1.20	2.53
Latrobe..........	1.05	2.13	Low sulphur ¾....	1.25@1.30	2.68
Somerset (best)...	1.35	2.53	Low sulphur slack.	.80	2.18
Somerset (good)...	1.20	2.38			
Quemahoning.....	1.35	2.48@2.53			
Freeport.......	.95@1.00	2.03@2.08			
Miller Vein...	1.15@1.25	2.28@2.33			

* F. o. b., outside Capes.

HAMPTON ROADS

Shipments for week light. Little demand for coal for prompt movement. October tonnage showing considerable falling off.

Dumpings over the various piers at Hampton Roads for the past week have been somewhat light as compared with a few weeks ago. The movement to Italian ports has fallen off somewhat although there have been several cargoes to that port. The largest cargo of the week for an Italian port was 9,000 tons which went to Genoa; other shipments went to Torre Annunziata, Genoa and one cargo to Gibraltar for orders for an Italian port.

The government took a small amount of coal by collier during the week. The number of bunker vessels coming in was light. The Norwegian steamer "Roald Amundsen" took about 5,200 tons of coal for a six months' whaling trip South this being the largest quantity of bunkers loaded into any one vessel at this port for some time.

The accumulation of coal on the railroad yards is rather excessive although some shippers are short on particular grades. There is a fair amount of vessel tonnage about due which will cut well into the accumulation now on hand but unless the demand improves and some spot sales are made for immediate movement the dumpings for the month of October will be considerably less than was anticipated.

Railroad Tonnages—Dumpings over the local piers for the past five weeks compare as follows:

	Week Ending				
Railroad	Sept. 18	Sept. 27	Oct. 2	Oct. 9	Oct. 16
Norfolk & Western....	182,047	163,400	131,055	140,934	......
Chesapeake & Ohio....	87,686	91,341	72,996	93,344	66,361
Virginian.............	59,597	79,176	59,997	65,150	54,964
Totals............	329,330	333,917	264,048	299,428	

Ocean Charters, Clearances and Freights

VESSEL CLEARANCES

The following steamers have cleared from various ports, during the week ended Oct. 15:

NORFOLK

Vessel	Destination	Tons
Achilles[1]	Cristobal	12,022
Bellatrix[2]	Havana	3,228
Muskegon[2]	Blanca	4,696
Gorredijk[3]	Antofagasta	6,679
Venus[4]	Gib	5,510
Genesee[5]	Montevideo	3,811
August[6]	Genoa	9,000
Luzon[6]	Annunziata	5,300
Lady Plymouth[2]	Italy	5,662
W. D. Noyes[8]	Brazil	5,506
G. Hubbard[7]	Georgetown	2,400

NEWPORT NEWS

Vessel	Destination	Tons
Navarre[9]	Georgetown	3,100
Thelma[9]	Cuba	1,850
Nolismen[10]	Genoa	7,417
Tancred[11]	Cardenas	4,600
Francis[11]	Manaos	1,775
Thorsa[12]		1,500

PHILADELPHIA

Vessel	Destination	Tons
Sif	Ft. de France	
Trym	Cienfuegos	1,138
F. C. Bowen	Calias	892
Orkild	Cuba	1,622
Monitor[13]	Providence	
Enterprise[13]	Boston	
Rutherford[13]	Lynn	
Lincoln[13]	Cambridge	
Kohinoor[13]	Brookline	
Phoenix[13]	Cambridge	
Oak Hill[13]	Portsmouth	
Hammond[13]	Gloucester	
Oley[13]	Searsport	
Spring[13]	Bangor	
Mahanoy[13]	S. Portland	
Wiconisco[13]	Newburyport	
Robesonia[13]	Boston	
Beechwood[13]	Brookline	
Eagle Hill[13]	Milton	
Saucon[13]	Ft. Warren	
Brookside[13]	Brookline	
Paxinos[13]	Everett	
Bast[13]	Camden	
Pocopson[13]	Hallowell	
Skippack[13]	Brookline	
Pickering[13]	Randolph	
Molino[13]	Portland	
Bear Ridge[13]	Portland	
Irwin[14]	Providence	
F. W. Munn[14]	Boston	
Powell[14]	Boston	
Augusta	Camden, Me.	875
Barry[13]	Com. Point	
Herndon[13]	East Boston	
Cocalcico[13]	Boston	
Draper[13]	Dorchester	
Indian Ridge[13]	Bangor	
Yardley	Bangor	
Conewago[13]	Portsmouth	
Langhorne[13]	Portland	
Kimberton	Portland	
Berwindmoor[9]	Havana	
Ephrata[13]	Lynn	
Silver Brook[13]	Boston	

BALTIMORE

Vessel	Destination	Tons
Teviotdale	Italy	4,652
Biemiller	Guatamala	1,528
Petritzis	Italy	5,246
Adriatico	Spain	3,107
Luigi	Italy	4,700
Davenport	Cuba	1,001

[1] W. C. Atwater. [2] New River Coal Co. [3] Baker Whiteley. [4] Flat Top Fuel Co. [5] C. G. Blake Co. [6] Pocahontas Fuel Co. [7] Castner, Curran & Bullitt. [8] Smokeless Fuel Co. [9] Berwind White. [10] C. H. Sprague. [11] Cinn. & Ohio Coal and Coke Co. [12] W. Va. Coal Co. [13] Phila. & Reading C. & I. Co. [14] Sterling Coal Co.

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	To	Tons	Rate
W. E. Downes	Fort-de-France	639	
Wilhelmina	Houston, Tex.	1,069	
E. W. Hinkley	Guayanilla	1,200	3.00
Eagle Wing	Mayport	1,900	
Pendleton	Surinam		

BALTIMORE

Vessel	Destination	Tons	Rate
G. Hawley	Galveston	1,699	
J. T. Maxwell	Surinam	461	
Plymouth	Mediterranean	7,000	
G. E. Warren	Galveston		
S. del Mare	Italy		
L. L. Baxter	Cienfuegos		
R. B. Cobb	Martinique	530	
A. B. Phillips	Martinique	451	

VIRGINIA

Vessel	Destination	Tons	Rate
Genesee	Buenos Aires	1,821	
Hesperos[1]	River Plate	2,722	8.15
D. Palmer	Italy	2,315	10.00
Fauna	Trinidad	728	

[1] 500 tons per day discharge.

OCEAN FREIGHTS

Very few steamers are offering for export coal, as owners can secure time charters for general cargo to same destinations at rates higher than coal shippers can afford to pay. When an occasional boat is offered for coal she is immediately accepted on one of the numerous coal orders in the market. It was reported a few days ago that London parties were offering $9.60 on coals from United States to Lower Plate ports, but we have been unable to ascertain whether or not this report is correct. We understand that some of the Plate consignees have purchased African coal to cover orders they originally intended shipping from here. We would quote freight rates on coal by steamer as follows:

To	Rate	To	Rate
Havana...............	$2.50@2.75	Bermuda..............	$3.00@ 3.25
Cardenas or Sagua......	2.75@3.25	Vera Cruz.............	4.75@ 5.00
Cienfuegos............	3.00@3.50	Tampico..............	4.75@ 5.00
Port au Spain, Trinidad.	3.50@3.75	Rio..................	**9.12**
St. Lucia..............	3.50@3.75	Santos	**9.12**
St. Thomas............	3.25@3.50	Montevideo...........	8.88@ 9.60
Barbados..............	3.50@3.75	Buenos Aires or La Plata	9.12@ 9.60
Kingston..............	3.00@3.25	Rosario...............	9.36@10.08
Curacao...............	3.25@3.50	West Coast of Italy....	14.40
Santiago..............	3.25@3.50	Barcelona.............	12.00@13.20
Guantanamo...........	3.25@3.50	Valparaiso or Callao....	7.50
Demerara.............	5.50@6.00	Marseilles............	13.20

* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British steamers; neutral steamers are more difficult to obtain and the rates are always higher.

W. W. Battie & Co.'s Coal Trade Freight Report.

LAKE MARKETS

PITTSBURGH

Domestic and line demand increased, making market slightly firmer despite impending end of Lake shipping. Car shortages more frequent with serious difficulties feared. Labor growing scarcer.

Conditions as to demand for coal are increasing at least rapidly enough to overcome the disturbance that usually develops as the Lake shipping season approaches its end. If it were not for this influence the coal market would probably be definitely advancing at the present time. Domestic demand is expanding with the season, though retail dealers are still buying chiefly from hand to mouth. Railroad consumption is increasing and some of the lines are now stocking considerable coal. The line demand generally is increasing.

The iron and steel industry, which apparently reached its possible maximum of coal consumption a few weeks ago, appears to be taking a little more for current consumption while it is likely that some stocking will be done in the near future, against expected difficulties in transportation in the bad weather. The steel industry can less afford to take any risks on fuel supply than at any time before when the steel market has been strong, as some of its products are selling at fancy prices and everything must be counted to insure maximum production every day.

Labor is growing scarcer with increased demand in so many quarters, but there is still some slack to be taken up by the men working fuller time. Car shortages are almost daily growing more in evidence and serious difficulties are anticipated before long. Thus far car shortages, while often reported, have hardly amounted to more than inconveniences.

Slack is up about 10c. a ton for prompt shipment, Youghiogheny gas usually commanding about 70c., and sometimes more, but Monongahela steam slack is available at about 10c. less. Mine-run and screened are not quotably higher but are firmer, particularly for free coal. We quote free coal: Slack, 60@70c.; nut and slack, 95c.@$1; nut, $1@1.05; mine-run, $1.05@1.10; ¾-in., $1.12@1.20; 1¼-in., $1.25; on contract to Apr. 1: Slack, 85@95c.; mine-run, $1.15; ¾-in., $1.25; 1¼-in., $1.35, per net ton at mine, Pittsburgh district.

BUFFALO

Wave of bituminous activity coming slowly from Pittsburgh. Prospect of good movement next month. Car shortage spreading. Prices stiff.

Bituminous—The activity is visibly increasing, but is not as great as in the Pittsburgh district; in fact, it is doubtful if this market will equal the Pittsburgh district. All prices are strong, however, and the car shortage alone would be enough to insure firmness. It is reported that some of the leading Pittsburgh companies have made a higher price for the Canadian market, but there does not appear to be any advance ordered for Buffalo. The Pennsylvania R.R. is reported to be confiscating coal right along and there is not much report of consignment coal on track. In fact, the mines have all they can do to get the cars they need and to ship them out in time.

There is not much new activity eastward in the state yet; when the boom began there was a surplus of coal there which had to be worked off. Canada is also quiet as yet; all reports from there agree that the country is taking a much slower pace since the war. It will be hard to shake off this lethargy.

Bituminous prices are more firm from week to week, the following quotations prevailing:

	Pittsburgh	Allegheny Valley	Penn. Smokeless
Lump	$2.65	$2.45	$2.55
Three-quarter	2.55	2.30	....
Mine-run	2.45	2.20	2.30
Slack	2.20	2.10	2.30

Prices are f.o.b. per short ton to Buffalo and Rochester points and per long ton east of Rochester.

Anthracite—There is a steady increase of activity and the retailers are getting back to business. In another month the local trade should be up to the average. A new situation in the through anthracite trade is developing by the scarcity of box cars. This district makes a great part of its shipments in box cars. If they become very short the trade will be badly affected and the grain movement will also be cut down. Quotations are: Grate, $5.65; egg and stove, $5.85; chestnut, $6.10; pea, $4.30; buckwheat, $3.25; rice, $2.75; barley, $2.50; screenings, $2.25, all per gross ton f.o.b. Buffalo, with 25c. additional for delivery on board vessel. Lake shipments of anthracite for the week were 108,500 tons, a fair amount.

COLUMBUS

Strength developing in all departments. Steam increasing rapidly and prices have advanced. Retail trade active.

There is an increased demand for steam grades, due to the general expansion in manufacturing. All branches of the iron and steel industry are active and consequently there is a much better demand. Railroads also continue taking quite a good tonnage.

The domestic trade is also active and strong. Dealers are now buying better as their customers are requesting quick deliveries. Some of the retailers in Columbus have been compelled to put on additional men. Retailers' stocks are only fair and they are forced to place orders for replenishment. Practically all of the domestic orders are accompanied by a request for immediate shipment. Retail prices remain strong with Pocahontas and West Virginia splints in good demand. There is also a good demand for White Ash and Red Ash and Hocking lump is moving well. The advance in the circular of 10c. per ton made during the past week have been well maintained. It is likely another increase will be made within a short time.

Lake trade is rather active although the close of the season is approaching. Several of the Ohio shippers have finished their Lake contracts while others are still rushing a large tonnage to the head of the Lakes. Chartering of boats is about over for the season. Congestion at the upper lake ports is not as marked as formerly.

Car shortage on the Chesapeake and Ohio is delaying shipments. Some shortage of cars is also reported on the Norfolk and Western but not as bad as on some other roads. Ohio roads are in fairly good shape as yet but a shortage is anticipated.

Anthracite trade is increasing rapidly and prices are well maintained in Columbus and Central Ohio territory. The coke market is also growing stronger as manufacturing increases.

Prices in Ohio fields per short ton, f.o.b. mines are as follows:

	Hocking	Pomeroy	Eastern Ohio	Kanawha
Re-screened lump	$1.60	$1.65		
Inch and a quarter	1.50	1.50	$1.35	$1.50
Three-quarter inch	1.35	1.40		1.35
Nut	1.25	1.30		1.25
Mine-run	1.15	1.20	1.05	1.10
Nut, pea and slack	.70	.75	.55	.60
Coarse slack	.60	.65	.45	50

Mines have been working at about the following percentages of full capacity:

District	Week Ended				District	Week Ended			
	Sept. 25	Oct. 2	Oct. 9	Oct. 16		Sept. 25	Oct. 2	Oct. 9	Oct. 16
Hocking	50	50	50	55	Cambridge	45	45	50	60
Jackson	25	25	30	40	Massillon	45	45	55	69
Pomeroy	75	80	75	85	Eastern O.	75	80	80	85
Crooksville	40	40	45	50					
					Average	50	52	55	62

CLEVELAND

Car shortage restricting shipments, but prices remain unchanged. Heavy receipts over Sunday kept jobbers busy cleaning up, but the market well maintained under the pressure.

Four hundred cars came in over Sunday, shipments from the mines having come through without delay and very much bunched. Cars are not being furnished as fast as the mines could use them and shutdowns are the rule. Some mines have been closed down as much as three days a week. But there is a distinct tone of improvement. Some of the operators have withdrawn quotations for the time being on account of the car situation and others have added from 5 to 15c. to contract quotations.

The Lake trade is not shipping as heavily as it could if the coal could be obtained from the mines. The upper Lake locks are moving fairly good tonnages, and will go into the winter with enough soft coal to carry them through without any trouble. Anthracite shippers are sending an extra tonnage up the Lakes to be prepared for a suspension in the spring. The receipts of hard coal at Duluth-Superior are 80,000 tons ahead of last year, with soft coal receipts 1,200,000 tons behind last year and still falling off.

Jobbers are being quoted at the following prices f.o.b Cleveland per short ton:

	Pocahontas	Youghiogheny	Fairmont	Bergholz	Ohio No. 8
Freight rate	$1.45	$1.00	$1.15	$0.70	$0.90
Lump	3.70				
Lump, 6-in.				2.30	
Lump, 1¼-in.		2.40		2.10	2.15
Lump, ¾-in.		2.30	2.05	2.00	1.95
Egg	3.70				
Egg, 6-in				1.90	
Mine run	2.80	2.15	1.95	1.85@1.90	1.85
Slack		1.75@1.80	1.85	1.65	1.70

DETROIT

Gradual broadening of market and improved sales of steam coal. Domestic market reacts as result of higher temperature. Anthracite business light. Lake shipments below normal.

Bituminous—More general buying and renewal of orders give a more satisfactory aspect to the market for steam coal. Reduction in the sales of domestic coal are reported in consequence of the warmer weather. Little trouble is encountered in the sale of consignment stock, and while the supply of lump and egg seems more than adequate, the fine coals move quickly.

Anthracite—A scarcity of stove size and difficulty in obtaining sufficient cars of the required kind are the chief features of interest in the hard coal trade.

Lake Trade—Lake shipments are being handled almost wholly by freighters engaged in the iron ore trade. Vessels of independent fleets have been drawn into the grain trade and owners are unwilling to sacrifice the time that would be required in handling coal. The movement from the mines is somewhat restricted by lack of cars.

CINCINNATI

The car situation continues bad, with only about 50% of requirements, and prices have stiffened materially. Demand seems to be improving.

With a large deficit in storage supplies to be made up within a limited space, a car shortage of grave proportions will make this difficult. The Chesapeake & Ohio and the Baltimore & Ohio seem to be the worst off so far, but it seems that all of the coal-carrying roads, excepting possibly the Louisville & Nashville lines serving the eastern Kentucky district, are short of cars. Operators are able to move only a fraction of their output, in some cases only about 20% of the required equipment being available. As a result the market has stiffened, the steam trade responding particularly well. Unless more cars return from the Northwest it seems that the shortage will increase rather than diminish. Undoubtedly any cold weather at this time would send prices soaring, and might even cause distress among domestic consumers.

LOUISVILLE

Colder weather and car shortages have stiffened up the market. Operators cautious about future commitments.

A general stiffening of the Kentucky coal market under the influence of the car shortage, and the approach of the cold weather, together with improved industrial conditions, is reported by the Louisville operators. Eastern Kentucky mines are losing from two to three days a week and are reduced to a 60% schedule because of inability to get cars. Demand is showing an improvement and the movement is brisker. Operators are somewhat indisposed to undertake contracts for deliveries after the first of the year, it being considered that a general advance in labor costs is almost certain.

Sales during the week past, long ton basis, f.o.b. mines, have been made around $1.25 and $1.30 in Western Kentucky and $1.75 to $2.10 Eastern Kentucky for block, while pea and slack in Western Kentucky is still slow and different grades of Eastern Kentucky nut and slack have ranged from 25 to 40c. for low grades and 50 to 60c. for the best grades.

BIRMINGHAM

Coal trade some better though not as good as could be expected.

The coal business, both on steam and domestic lump, is better than it was thirty days ago, but there is still room for improvement. Shipments on contracts are satisfactory, but new business seems rather quiet. Lump coal is moving fairly good. Due to the small cotton crop, the oil mills throughout the South will have a short run this season, which will materially affect the tonnage of steam coal usually consumed by that class of trade. It is estimated that very few mills will operate later than the latter part of December, whereas, the season usually runs through March.

COKE

CONNELLSVILLE

Additional furnace coke contracting. Spot experiences sharp advance, giving operators somewhat higher views as to contracts. Production and shipments at new record for year.

Pickands, Mather & Co. have contracted for coke for one Toledo stack for the first four months of next year and for their two stacks at Erie and West Middlesex respectively for six months, while they still have to buy for another Toledo stack for the first three months of next year, the total coke being about 45,000 tons a month. The purchases for Toledo are timed to fill up until the byproduct plant at that point is completed. The price paid on the business closed is understood to have been about $2.25. Total contracting on this movement now amounts to fully 175,000 tons a month, for various periods, with a third or a fourth of the business still to be closed.

Last Friday morning it developed that overnight spot and prompt furnace coke had become very scarce, and $2.25 was bid freely not only for spot but also for any shipment this week, without bringing out enough coke to meet requirements, and at least $2.25 is being bid this week. It is said the chief prompt requirement is to tide over the Republic Iron and Steel Co. until its second block of byproduct ovens is operating, early in November, but spot coke may be $2.50 before the week is out, and the scarcity is inclining operators to ask more money on contract. Demand for foundry coke is only fair. We quote: Spot and prompt furnace, $2.25@2.35; November-December, $2.25; first half, $2.35@2.50; year 1916, $2.25@2.35; foundry: Spot, $2.30@2.60; contract, $2.40@2.60, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Oct. 9 at 417,724 tons, an increase of 20,135 tons, and shipments at 418,082 tons, an increase of 22,839 tons. The figures make new records for the year, and reflect one of the largest increases for a week over the preceding.

Buffalo—There is a steady increase in activity from week to week despite some report of over-production. Jobbers differ considerably in their reports of prices, though most of them state that they have paid higher prices this week than last. Shortage of box cars for foundry coke is reported. Best 72-hr. Connellsville coke in this market is not below $4.40, with $3.45 for stock coke.

Chicago—The coke market shows further strength. An advance of from 10c. to 15c. has taken place on byproduct foundry coke, and domestic sizes have stiffened. It is reported that considerable Eastern foundry coke is now being bought for this territory. Prices per net ton f.o.b. cars Chicago are as follows: Byproduct foundry, $5@5.25; byproduct domestic, $4.85@4.95; Connellsville, $4.85@5; Wise County, $4.85@5; gas coke, $4@4.15.

Birmingham—On account of the additional furnaces being put into blast in this district, there is a ready market for furnace coke, both beehive and byproduct, with prices around $2.75 for beehive 48-hr. coke and $2.25 to $2.40 for byproduct. Foundry coke is not as active as furnace coke, though the price is holding up.

MIDDLE WESTERN

GENERAL REVIEW

Domestic market shows increased activity screenings and steam coals stronger. Anthracite in healthy demand.

The domestic trade continues at an unusually brisk rate due to the early cold weather. The steam trade has also improved. Current shipments of all grades are being quickly consumed, so that stocks are not accumulating, and there is evidence that the demand is rapidly outstripping the supply. Rush orders are frequent and it is clear that the Western coal trade is in a flourishing condition. Salesmen making the Western territory report that not more than one-fourth of the normal volume of retail business has been done thus far and this undoubtedly means a lively demand throughout the balance of the year. Retailers have restricted local credits, and many of them are only doing business on a cash basis. Screenings are stronger; heavy absorption by large consumers has been reported, and a large tonnage of free screenings has been eliminated from the market. Some of the Western roads have advised operators that system cars can only be used for loading company coal.

CHICAGO

Demand good, car shortages developing and price concessions eliminated. Eastern coals short and orders urgent. Kentucky grades strong.

Franklin and Williamson County coals are in good demand, especially domestic sizes. Car shortages have developed on several roads, though not serious as yet. Williamson County coals are stiffening and all price concessions have been eliminated. Saline County operators are sold ahead on screenings for some time to come.

Springfield lump is sold as rapidly as produced, and screenings have been firm.

Indiana domestic grades are strong, and prices will advance as soon as another cold snap arrives; the output of these sizes is larger than it was this time a year ago. Retailers are maintaining full stocks. Railroads are ordering increased quantities but industrial consumption is still slow. Car shortages are reported here and there. Sullivan County screenings have eased off somewhat.

West Virginia smokeless shipments are scarce due to car shortages. Rush orders have been placed with the mines which cannot possibly be filled, and some of the dealers in the Chicago district are much alarmed over the outlook. Pennsylvania smokeless is stronger because of the lack of shipments from West Virginia. The splint market is in better shape.

Hocking domestic trade is lively, and retailers are buying in considerable volume. Much school coal is being covered. The demand for steam sizes is comparatively strong due to stocking by railroads and increased fuel requisitions from manufacturers. Circular prices are well maintained.

In the Kentucky field a better situation exists. Tracks have been cleared of surplus coals, and the outlook is more promising than for a long time.

Anthracite representatives in Chicago have been flooded with a rush of orders.

Quotations in the Chicago market are as follows:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump	$1.75	$1.65@1.75	$1.50@1.70	$1.40@1.60	$1.40@1.60
Steam lump	....	1.25@1.30	1.20@1.30	1.25@1.35	....
2½ and 3-in. lump	....	....	1.40@1.50	....	1.30@1.40
1¼-in. lump	....	....	1.25@1.30	1.25@1.30	....
Egg	1.65@1.75	1.50@1.65	1.10@1.20	1.10@1.25	1.15@1.25
Nut	....	1.60@1.65	1.00@1.10	.95@1.10	1.00@1.05
No. 1 washed	1.75	...	1.50@1.60	....	....
No. 2 washed	1.40@1.50	....	1.40	....	....
No. 1 nut	1.65@1.75	....	....	....	....
No. 2 nut	1.40@1.50		....		....
Mine-run	1.10@1.15	1.00@1.05	.85@.90	1.00@1.05	.85@1.05
Screenings	.50@.60	.40@.50	.40@.60	.55@.65	.75@.80

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.60@1.75	$1.75@2.25	$2.25	$1.75@2.25	$1.60@1.75
1¼-in. lump	1.25@1.35	....	....		1.35
Egg	1.60@1.75	1.45@1.75	2.25	1.75@2.25	1.00@1.10
Nut	....	....	....	....	....
No. 1 nut	1.65@1.75	1.60	....	....	....
No. 2 nut	1.40	....	..		....
Mine-run	1.15	1.00@1.15	1.40	1.25@1.40	1.15@1.25
Screenings	.60@.65	.75@.90	..	....	.50@.65

INDIANAPOLIS

Indiana mines keep up active operation, though lacking the stimulus of cold weather. More mines opened.

There have been no material changes in the trade largely because moderate weather still prevails. Production, however, keeps up to its recent level and the market loses nothing of its strength. Railroads continue active buying and there is improvement in the volume of coal taken by manufacturing industries. Some additional mines have been opened after the summer idleness. Retail yards continue busy and some of them complain that they cannot get Eastern coals fast enough for their requirements. Recent prices still prevail. Some operators say that while working conditions are much improved over those of September and preceding months they are still selling practically at the summer price level.

ST. LOUIS

Colder weather has stimulated domestic business and urgent orders are being received. Increased production of screenings softens the market on that size.

A touch of wintry weather has stimulated the lump and egg market. Domestic users, who as a rule are six weeks later with their orders than last year, are sending in urgent orders for coal, and retailers have placed rush orders. Williamson County egg advanced to $1.50. The increased working time at the mines has reduced the price of screenings. The mines are operating four and five days a week. Carterville lump is somewhat scarce, while egg and No. 1 nut are a little slow. Country business was better on standard. All domestic sizes were moving more freely. Lump increased 5c. all around. There is practically no change in the steam situation.

Quotations f.o.b. mines ranged on the following basis per short ton:

	Frk. Co.	Wmsn. Co.	Staunton	Standard
6-in. lump	$1.50@1.75	$1.50@1.75	$1.25@1.50	$1.15@1.25
2-in. lump	......	......	1.15@1.20	1.05@1.10
3x6 egg	1.35@1.75	1.50@1.65	......	1.00
No. 1 nut	1.50@1.75	1.50@1.75	......	.85
No. 2 nut	1.40@1.50	1.40@1.50	......	.55@.65
No. 1 washed	......	1.65	1.40@1.60	....
No. 2 washed	......	1.25	1.10@1.25	....
No. 3 washed	......	1.25	1.00@1.25	....
No. 4 washed	......	1.20	1.05	
No. 5 washed	......	.60@.70	.50@.60	....
Screenings	.40@.50	.40@.50	.25@.30	.25@.30

Freight rates: From inner group of mines, St. Louis, 57½c.; East St. Louis, 37½c. From outer group, St. Louis, 72½c.; East St. Louis, 52½c.

DULUTH

Domestic buying brisk. Shipments show a steady and gradual increase. Bituminous arrivals less than last year.

Shipments to the country districts show a considerable increase over a year ago for this period, and with normal weather, shippers hope to see a still greater increase. With the cool weather now prevailing much interest is noted in the domestic sizes and inquiries are more frequent, but still colder weather will be necessary before any great activity can be looked for. Receipts are slightly larger than last week and the total for the season to Oct. 1 is: Anthracite 1,129,220 tons as compared with 1914 shipments of 1,070,800 tons and bituminous 4,750,145 as compared with 6,309,300 tons in 1914. Prices f.o.b. cars, Duluth, are as follows:

	Yough.	Splint	Hock.	Smokeless	Elkhorn
Lump	$3.40	$3.40	$3.40	$4.75	$3.75
Dock-run	3.10	3.10	3.05	3.25	3.25
Stove or nut	3.40	3.40	3.40	4.75	3.65
Screenings	2.40	2.40	2.25	2.75	2.40

Weather conditions have been favorable for the movement of a fair volume of anthracite to the retail trade. Dealers teams are in greater evidence on the streets than for some time past and the thrifty householder is laying away his supply of fuel for the winter. Dock companies quote f.o.b. cars per short ton as follows: Egg and stove, $6.85, nut, $7.10, pea, $5.55 and buckwheat, $5.55.

PRODUCTION AND TRANSPORTATION STATISTICS

SOUTHWESTERN TONNAGE

The following is a comparative statement of the Southwestern tonnage for May and the preceding three months:

	May		June		July	
State	1914	1915	1914	1915	1914	1915
Missouri	165,394	161,575	185,731	166,885	177,093	188,816
Kansas	370,097	354,264	490,561	449,803	513,312	453,[illegible]35
Arkansas	95,749	71,023	133,350	71,498	117,016	78,568
Oklahoma	241,180	173,821	273,692	201,126	234,648	204,993
Totals	872,421	760,683	1,083,334	889,312	1,042,069	926,312

NORFOLK & WESTERN RY.

The following is a statement of coal handled by the N. & W. Ry. during September and the past four months in short tons:

	June	July	August	September
Pocahontas Field	1,493,776	1,648,551	1,721,573	1,620,362
Tug River District	348,737	361,454	337,585	354,981
Thacker District	238,688	265,743	227,312	230,198
Kenova District	81,794	80,009	80,152	89,921
Clinch Valley District	155,689	146,911	151,804	144,234
Other N. & W. Territory	3,418	2,651	4,239	3,798
Total N. & W. Fields	2,322,102	2,505,319	2,522,665	2,443,494
Williamson & Pond Creek	75,573	86,949	89,785	87,152
All other railroads	282,790	262,177	348,124	324,913
Grand total	2,680,465	2,854,445	2,960,574	2,855,559

CHESAPEAKE & OHIO RY.

The following is a comparative statement of the coal and coke traffic from the New River, Kanawha and Kentucky districts for August and the two months of the fiscal years 1914 and 1915, in short tons:

	August				Two Months			
Destination	1915	%	1914	%	1915	%	1914	%
Tidewater	504,491	22	339,395	16	988,980	23	601,455	15
East	198,045	9	194,321	9	352,663	8	380,934	10
West	1,378,070	62	1,438,781	69	2,611,330	61	2,656,962	68
Total	2,080,606		1,972,497		3,952,973		3,639,351	
From Connections								
Bituminous	156,019	7	131,720	6	338,308	8	265,217	7
Anthra. (local)	138	...	....	...	138	...	....	...
Anthracite	1,669	...	1,866	...	2,988	...	2,744	...
Total	2,238,432	100	2,106,083	100	4,294,407	100	3,907,312	100
Coke	25,010		21,181		46,970		46,214	

VIRGINIAN RAILWAY

Total shipments of coal over the Virginian Ry. for August, amounted to 411,090 tons, which compares with 381,853 tons for the previous month and 361,906 tons for August of 1914.

I. C. C. RULINGS

I. C. C. No. 5905—Plymouth Coal Co. vs. Lehigh Valley R.R. Co.

1. Defendant has justified its refusal to continue to furnish storage bins at Perth Amboy, N. J., for the free storage of anthracite coal.

2. Defendant's demurrage regulations governing anthracite coal awaiting trans-shipment at tidewater at Perth Amboy found reasonable.

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

✚Indicates contracts regarding which official information has been received.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

✚1372—Latrobe, Penn.—All the bids on this contract (p. 446), which provides for furnishing the Derry Borough School Board with Jamison No. 1 grade mine-run coal, have been rejected and the coal bought in the open market at $1.10 per ton. Address Pres. J. D. Neely, Derry Borough School Bd., Latrobe, Penn.

1406 — Ogden, Iowa — Four bids were submitted on this contract (p. 448), which provides for furnishing the best grade lump and mine-run coal to be delivered in carload lots at the local school buildings, but all were rejected, and the Board has divided the business among local dealers, paying $3.35 per ton delivered. It is stated that the Board will be glad to consider prices from concerns to buy direct from the mines. About 150 tons is involved. Address Pres. D. A. Good, Bd. of Edu., Independent School Dist., Ogden, Iowa.

1497—Cleveland, Ohio—Bids have been received on this contract (pp. 577, 616), which provides for furnishing approximately 7,500 tons for the Cleveland Pumping Station, as follows: Valley Camp Coal Co., $1.67½ on No. 8 and $1.77 for Acme Pennsylvania coal; Moreland Coal and Coke Co., $2.05 per ton on West Virginia coal. Prices are in both instances for slack coal delivered in Cleveland as required. The price of the Valley Camp Co. is regarded as extremely low considering the outlook. Address Comr. of Purchases and Supplies A. R. Callow, 511 City Hall, Cleveland, Ohio.

1541—Scranton, Penn.—The bids on this contract (p. 617), calling for a supply of coal to the schols in this city, resulted as follows:

	High School	District No. 1			District No. 2			District No. 3			District No. 4		
	Buckwheat	Stove	Nut	Pea	Stove	Nut	Pea	Stove	Nut	Pea	Stove	Nut	Pea
Standard Coal Co.	$2.50	$4.20	$4.40	$3.25	$4.10	$4.35	$3.25	$4.20	$4.40	$3.25	$4.20	$4.50	$3.25
Carlton Coal Co.	2.70	4.25	4.40	3.50	3.85	4.10	3.50	....	....	....	4.50	4.75	3.50
Bull's Head Coal Co.	2.50	4.15	4.50	3.50	4.15	4.50	3.50	4.25	4.50	3.50	4.15	4.50	3.50

The James J. Kearney Coal Co. submitted flat prices for the delivery of coal in all districts as follows: Stove, $4.25; nut, $4.50; pea, $3.25; buckwheat for High School, $2.40. The award has not as yet been made. Address Secy. G. E. Haak, School Board, Administration Bldg., Scranton, Penn.

1510—New Orleans, La.—This contract (p. 577), which provides for furnishing the Louisiana Distilling Co. with approximately one car of steam coal per day, is now being closed. Address Purchasing Agent, Louisiana Distilling Co., 865 South Peter St., New Orleans, La.

1528—Memphis, Tenn.—Purchases on this contract (p. 616), which provides for furnishing the South Memphis Brick Co. with approximately 10,000 of No. 2 lump coal, will be made as required. Address Pur. Agt. John J. Bishop, South Memphis Brick Co., Madison St., Memphis, Tenn.

1545—Ocean City, N. J.—Bids have been received on this contract (p. 617), which provides for furnishing the Board of Education with its fuel requirements for the coming season, as follows: C. H. Shoemaker Lumber Co., nut, $7.35; pea, $5.60; Hedley & Adams, nut, $7.35; pea, $5.60. Address Secy. L. E. Smith, Bd. of Edu., Ocean City, N. J.

✚1549—Trenton, N. J.—Bids have been received on this contract (p. 617), which provides for furnishing and delivering approximately 3,500 tons of bituminous coal to the local Pumping Station and 300 tons to the Municipal Building, as follows: The James Oliphant Supply Co., Keystone stoker, $3.70; Hirsch Bros., bituminous, $3.85; the Tattersall Co., specified coal, $3.80; Thorne, Neal & Co., specified coal, $3.95. No award has yet been made. Address City Chemist A. Parobek, City Hall, Trenton, N. J.

New Business

1566—Cleveland, Ohio—The Cuyahoga County Board of Commissioners will receive sealed bids until 10 a.m., Nov. 3, for furnishing coal as may be required at the County buildings for the year beginning Dec. 21. About 30 tons of the best-grade Lackawanna egg coal will be required, 2,000 tons of Pittsburgh nut coal, and 100 tons of the best-grade bituminous lump. All bids must be accompanied by samples of not less than 25 lb. of coal it is proposed to furnish, and a certified check for $500 must be submitted with each bid. Address Clk. E. G. Krause, Cuyahoga County Comrs., Cleveland, Ohio.

1567—Hettinger, N. D.—The Adams County Board of Commissioners will receive bids until 10 a.m., Nov. 5, for furnishing lignite coal as may be required for heating the county building during the ensuing year. Bids should include cost of delivery in the bins as required. Address County Audr. Walter F. Kelley, Adams County Comrs., Hettinger, N. D.

1568—Bargaintown, N. J.—The Board of Education at this place received bids until 2 p.m., Oct. 21, for furnishing the schools at Bargaintown, Steelmanville, Scullville, and English Creek, with anthracite stove and nut coal as may be required during the ensuing year. Address Dist. Clk. William Hauenstein, Bd. of Edu., Bargaintown, N. J.

1569—Winner, S. D.—The County Government at this place will receive bids until 2 p.m., Oct. 28, for furnishing bituminous coal as may be required for use at the Court House during the coming winter. Address Audr. F. E. Wells, Winner, S. D.

1570—Goshen, Ind.—The Municipal Electric Light Plant at this place usually contracts for its annual fuel requirements during the latter part of November. About 3,500 tons of three-quarter lump coal is required and the customary price is approximately $2.60 per ton f.o.b. The business is done on competitive basis. Address City Clk. W. A. Brooks, Goshen, Ind.

1571—Ocean City, N. J.—The Department of Public Parks and Public Property at this place received bids until 1:30 p.m., Oct. 19, for furnishing coal as may be required at the City Hall during the ensuing year. Address Dir. George O. Adams, Dept. of Pub. Parks and Property, City Hall, Ocean City, N. J.

1572—Minot, N. D.—The Troy Laundry at this place received bids until 2 p.m., Oct. 15, for furnishing approximately 1,000 tons of lignite lump coal during the year beginning Nov. 1. All bids were to be f.o.b. cars at Minot. Address Purchasing Agent, Troy Laundry, Minot, N. D.

No. 1573—Philadelphia, Penn.—The City of Philadelphia is asking bids for additional supplies of coal on a deficiency contract (see also Contract 1516, pp. 577, 660), until the end of the present year as follows:

	Pea	Buck.	Bitu.
Belmont Pumping Station	6,900	2,300	.....
City Delivery	200	.....	.....
Mingo Creek Station	200	.....	.....
Belmont Filters	300	.....	.....
Queen Lane Filters	300	7,400[1]	.....
Spring Garden Pumping Station	100	.....	.....
Mt. Airy	100	.....	.....
Lardners Point Pumping Station	...	.....	17,000
Torresdale Filters	...	.....	8,500
Shawmut Pumping Station	...	.....	5,600
Georges Hill	...	400	.....
Roxborough Auxiliary	...	1,000	.....

[1] Pumping Station.

Bids will be opened at noon, Oct. 26. Proposal blanks may be had on application. Address, Director Herman Loeb, Department of Supplies, City Hall, Philadelphia.

1574—New Orleans, La.—The International Distillery Co., at this place, is in the market for their annual supply of coal involving approximately one car per day. Quotations should be made f.o.b. their switch. Address Pur. Agt. Kern, International Distillery Co., Pine and Ferdinand Sts., New Orleans, La.

+1575—Fountain Springs, Penn.—The State Hospital for Injured Persons will receive bids until Nov. 2 for supplying the Institution with coal during the year beginning Dec. 31. Complete information may be had on application. Address Supt., Dr. J. C. Biddle, State Hospital for Injured Persons, Fountain Springs, Penn.

1576—New Orleans, La.—The Lane Cotton Mills will contract some time before Nov. 15 for approximately 50 cars of steam coal. Address Pur. Agt. R. Lecorgne, Lane Cotton Mills, 434 Cadiz St., New Orleans, La.

+1577—Minneapolis, Minn.—The Glenn Lake Sanatorium Commission will receive bids until noon, Oct. 28, for furnishing approximately 1,000 tons of Pocahontas screenings. Deliveries are to be completed by Apr. 1, 1916, and all bids must be accompanied by a certified check for 5% of the amount bid. Specifications are on file at the office of the Secretary. Address Secy. Herbert O. Collins, Minneapolis City Hospital, Minneapolis, Minn.

+1578—Pittsburgh, Penn.—Sealed bids will be received until noon, Nov. 4, for furnishing and delivering coal to the Western Penitentiary during the year beginning Dec. 1. Bituminous coal is required, and quotations should be made f.o.b. cars, Rockville Station, on the Pennsylvania R.R. A certified check for $200 will be required with all bids. Address Supt. John Francies, Bd. of Inspectors, Western Penitentiary, North Side, Pittsburgh, Penn.

1579—New Orleans, La.—The Cosmopolitan Hotel will contract some time before Nov. 15 for their annual fuel requirements involving about 120 tons per month. Quotations are to include cost of delivery. Address Mgr., Major Stewart, Cosmopolitan Hotel, 120 Bourbon St., New Orleans, La.

+1580—Fort Slocum, N. Y.—Sealed bids were received until 9:30 a.m., Oct. 19, for furnishing and delivering coal in the bins or sheds at Fort Slocom as may be required by the steamer "General Barry" during the period beginning Nov. 1 of the current year, and ending June 30 next year. Complete information may be had on application. Address Capt. S. E. Smith, Quartermaster corps, U. S. Army, Fort Slocum, N. Y.

1581—New Orleans, La.—It is understood that the Leland Steamship Co. will contract some time in the near future for their annual requirements of coal involving approximately 50,000 tons of steam coal. Address Purchasing Agent, Leland Steamship Co., 1210 Hibernia Bank Bldg., New Orleans, La.

+1582—Erie, Penn.—Bids will be received until noon, Nov. 1, for furnishing the outdoor poor with anthracite and bituminous coal for the year beginning Nov. 2, and also for furnishing the Directors of Poor with the best quality three-quarter screened lump coal for the Erie County Almshouse for the same perior. Specifications are on file. Address County Controller Joseph E. Leslie, Erie, Penn.

1583—New York—Bids will be received by the Department of Docks until noon, Oct. 27, for furnishing and delivering approximately 2,000 tons of No. 3 buckwheat coal for use in the Borough of Richmond. For bids and awards on previous contracts of this department, see contract Nos. 935 and 1068. Full particulars may be obtained on application. Address Comr. R. A. C. Smith, Pier "A," New York.

1584—New Orleans, La.—The William Henderson Sugar Refinery at this place will contract for their annual requirements of coal, involving approximately 50,000 tons, some time before the end of the current year. A good-grade steam coal is required, and quotations should be made f.o.b. their tracks in South Peters St. Address William Henderson, William Henderson Sugar Refinery, 749 South Peters St., New Orleans, La.

1585—Montclair, N. J.—The State Board of Education will receive bids until noon, Oct. 30, for furnishing approximately 600 tons of pea coal and 60 tons of Lackawanna stove coal. Prices are to include cost of delivery in the bins at the schools as may be required. Address Chn. Melvin A. Rice, Normal School Committee, State House, Trenton, N. J.

1586—Pee Dee, S. C.—The Pee Dee Brick and Tile Co. will contract some time during November for their annual requirements of coal, amounting to approximately 700 tons a month. The business usually goes to the Stonega Coal and Coke Co. at about $2.40 per ton. The Pee Dee Co. has a storage capacity for 500 tons and deliveries are made by A. C. L. R.R. Address Pur. Agt. Edward Cox, Pee Dee Brick and Tile Co., Main St., Pee Dee, S. C.

1587—Jeanette, Penn.—The Jeanette Borough School District will receive bids until 8 p.m., Oct. 21, for furnishing and delivering coal to the various school buildings as may be required during the ensuing year. Full particulars may be obtained on application. Address Secy. J. C. Rovensky, Jeanette Borough School Dist., Jeanette, Penn.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

+1339—Cleveland, Ohio—This contract (p. 410), which provides for furnishing approximately 4,500 tons of coal for the garbage reduction plant at this place, has been awarded to the **Morris-Poston Coal Co.** at $1.84 per ton. Address Dir. A. A. Benesch, Pub. Ser. Dept., 204 City Hall, Cleveland, Ohio.

+1341—Great Falls, Mont.—This contract (p. 410), which provides for furnishing the schools of District No. 1 with coal during the ensuing year, has been awarded to the **Wilbur Transfer and Storage Co.** on the following basis: Mine run coal, f.o.b. and city school, $2.38 per ton; lump coal delivered at county schools $3.85 per ton; lump coal f.o.b. yard, $3 per ton; lump coal delivered at Franklin School on the west side, $3.50 per ton. Approximately 1,500 tons of coal are consumed per year. Address Clk. H. A. Cary, School Dist. No. 1, Great Falls, Mont.

1435—New Orleans, La.—This contract (p. 490), which provides for furnishing the Canal Bank and Trust Co. with approximately 150 tons of bituminous coal, has been awarded to the **W. G. Coyle Coal Co.,** the business being negotiated somewhat earlier this year than usual. Address Pur. Agt. E. L. Kiefer, Canal Bank and Trust Co., New Orleans, La.

+1437—Osage City, Kan.—This contract (p. 390), which provides for furnishing the local Electric Light Plant, and other city departments, with coal during the period beginning Sept. 15 of the current year, and ending Mar. 15 of next year, has been awarded to **John A. Johnson** on Osage City shaft mine-run coal at $3.20 per ton. The Big Six Coal Co. bid $3.30 per ton for the same coal. Address City Clk. C. E. Johnson, Osage City, Kan.

+1448—Crosby, Minn.—This contract (p. 490), which provides for furnishing the local Board of Education with approximately 300 tons of coal, has been awarded to the **Mahlum Lumber Co.** at $4.67 per ton. Address Clk. J. E. McCoy, Independent School Dist., Franklin School Bldg., Crosby, Minn.

+1454—Sharpsburg, Penn.—This contract (p. 530), which provides for furnishing the local Board of Education with coal during the ensuing year, has been awarded to **John Ross,** at $2.10 per ton for ¾-in. lump coal. Address Secy. G. A. Speer, Bd. of Edu., Sharpsburg, Penn.

1456—Portsmouth, Ohio—This contract (p. 530), which provides for furnishing the County Infirmary with approximately 5000 bu of coal, has been awarded to the **Norfolk & Chesapeake Coal Co.,** at $1.65 per ton for mine-run coal f.o.b. Portsmouth. Address County Audr. Thos. C. Patterson, Portsmouth, Ohio.

1460—La Moure, N. D.—This contract (p. 530), which provides for furnishing La Moure County Commissioners with approximately 100 tons of coal has been awarded to the **Tanner Elevator Co.** at $6.23 per ton for Hocking Valley or Virginia splint coal. Address County Audr. O. C. Temple, La Moure, N. D.

+1467—Highmore, S. D.—This contract (p. 531), which provides for furnishing the fuel requirements during the ensuing year to the County Court House, has been awarded to **M. E. Miller Co.** on Youghiogheny coal at $7.35 per ton. Address Audr. L. W. Carter, Hyde County, Highmore, S. D.

+1471—Fort Worth, Tex.—This contract (p. 531), which provides for furnishing the Tarrant County Orphans Home with coal has been awarded to **Murphy & Anderson,** at $4.95 per ton. Address County Audr. J. A. Mulholland, Tarrant County, Fort Worth, Tex.

+1472—Alpena, Mich.—This contract (p. 531), which provides for furnishing the local Board of Education with coal as may be required during the ensuing year, has been awarded to **M. N. Bedford & Co.** on Youghiogheny three-quarter lump at $3.40 per ton delivered. Address Secy. Alfred E. Ash, Alpena Bd. of Edu. Alpena, Mich.

1475—Cincinnati, Ohio—This contract (p. 531), which provides for furnishing the Hamilton County Infirmary at Carthage, with approximately 1,500 tons of Pocahontas or New River mine-run coal, has been awarded to the **Reliance Coal and Coke Co.,** at $2.44 per ton. Address Clk. Albert Reinhart, County Comr.'s Office, Cincinnati, Ohio.

1481—Mandan, N. D.—This contract (p. 576), which provides for furnishing the local Board of Education with approximately 200 tons of screened deep-mined lignite coal to be delivered at the various school houses, has been awarded to the **Mandan Transfer Co.** at $2.29 per ton. Address Clk J. H. Noakes, Bd. of Edu., Mandan, N. D.

+1484—Sunbury, Penn.—This contract (pp. 576, 616), which provides for furnishing the County Government with 250 tons of anthracite pea coal, has been awarded to the low bidder, **George A. Nevin,** at $2.90 per ton. Address Controller Aaron Baker, Court House, Sunbury, Penn.

COAL AGE

Vol. 8 NEW YORK, OCTOBER 30, 1915 No. 18

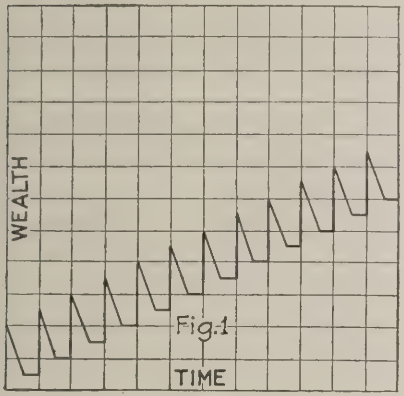


Fig.1

The Value of Thrift

What does the curve representing your financial condition look like? Does it show a gradual upward tendency or is it going steadily downhill?

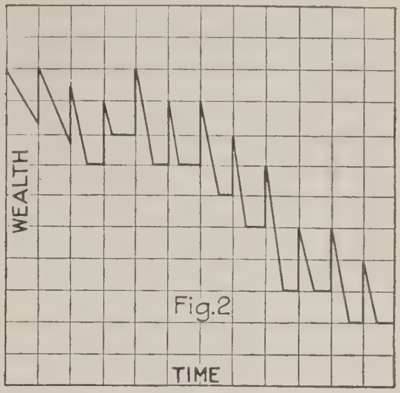


Fig.2

FIG. 1 tells the story of the wise man. He saves and provides for the future. Each payday comes and gives him a lift. He pays his bills promptly, and after his bills are paid, each balance is somewhat higher than the one before.

On the other hand, Fig. 2 illustrates the case of any number of persons. Here we see paydays coming at regular intervals, but followed by periods of temporary extravagance that result in a steady diminution of the capital of the thriftless person.

An industrial organization of any kind that does not plan for the future cannot exist for any length of time. Yet many families try to get along on the "feast or famine" principle that inevitably winds up in failure.

A young miner in the employ of a prosperous mining company recently remarked: "I don't see why I can't save any money. I'd like to save—that's certain. But for some reason or other I never have a cent two weeks after payday."

The time to think about saving is the minute when the pay envelope is handed to you—not two weeks later. The only practicable method of saving is to plan ahead and save first rather than last. The man who on payday lays by a reasonable and definite portion of his earnings is the one who accumulates wealth.

The person who thinks he will save what is left after he has lived for two weeks or a month on the proceeds of his previous pay seldom has anything left to save.

It is true that many families are enduring misfortune of one kind or another that prevents their saving anything. But there are countless others who are able and who know that they ought to save, but through indifference and lack of thrift they neglect the opportunity. On the other hand, it would seem that some persons have neither the ability nor the desire to save.

An incentive in the direction of economy is a carefully kept record of expenditures. If the person who thinks he cannot save will keep an account book for a month or two, or still better for a year, he will discover upon looking back over it that there were many useless expenditures that could easily be avoided in the future and the money involved could be invested or be placed to advantage in the bank.

An account book is useful also in planning for the future. With it one may readily estimate the proportion of his income required for necessary expenses, and thus determine the amount he may immediately take out of each pay to add to his savings. The importance of planning ahead cannot be over-estimated.

THRIFT MEANS GROWTH

The thrifty person grows in strength of character and in reputation. He provides for the future. A good name and a well-ordered life are things that are worth seeking.

South Africa's Interest in the South American Markets

By J. F. K. Brown*

SYNOPSIS—Coal in the Transvaal and Natal may be produced cheaply, and the labor supply is adequate and fairly steady. Although certain obstacles are to be overcome, it would appear that, despite its somewhat lower quality, South African coal could be laid down in South America at a price that would make it a strong competitor of both North American and English fuels.

In view of the discussions that have taken place on the possibility of an American export coal trade to the eastern seaboard of South America, it may be of interest to have a look at the resources of another country which has an eye on that business for itself at some time in the future—namely, South Africa.

A great variety of considerations help toward a country's success in an export coal trade, but of the more important considerations there are, first, labor—since this mainly determines the cost of production; second, the position of the mines governing the internal freights, and therefore costs at the point of shipment; third, the quality of the coal, which governs the price obtainable in the world's markets; and fourth, the volume of the internal trade—limiting in this particular case the total production of the country to a tonnage proportionately much lower than the possible gross production even with present equipment. This is a direct cause of the desire to look seaward for new worlds to conquer.

There is no ground upon which to base a comparison between coal-mining practice in South Africa and methods followed in the States, because the difference in essential features is great. There is a saying that "coal-mining practice is the same the world over," but like many other "sayings," it is only true superficially. An engineer accustomed to American practice, transported to South Africa, would find great differences on many points and would require to recast his knowledge and experience in order to judge the situation fairly.

The labor of South Africa is of course "black," but unlike the negro of the States, the black of South Africa only earns, roughly, 10 per cent. of the wages paid to the white man. On a month's work the black's wage will probably not be more than $15 to $20. The mine provides the rations, which consist of meal throughout the week and meat once on Sunday. As a gratifying addition some mines now and again add vegetables if they can get them.

Housing conditions are something on a par with the "quarters" of the negroes of the South in the days of slavery. A piece of ground is set apart, and on this either the company builds or the men themselves erect huts to suit their own taste. Those companies that build their own huts usually go a step farther and surround the compound with a wall and gate. They also attend to the preservation of order and cleanliness through an almost military organization. At times of tribal fights and other (sometimes nocturnal) diversions on the part of the black population, the usefulness of such compounds as these is evident.

Nevertheless the black man is not one whit behind his white brother in preferring his freedom, and those mines which do not draw the reins of control tightly and where a little freedom is allowed are better off generally in the supply of labor they control.

A SMALL HEADFRAME AND SCREEN HOUSE

VIEW OF COLLIERY OFFICES FROM HEADFRAME

The operation of the compound is under the eye of an official known as the compound manager whose duty it is to see that the blacks are well treated, that peace is preserved and that sanitary conditions are fulfilled—a very important matter in a hot climate. Under his guidance the men turn out to the shaft in the morning, and he investigates any cases of absence or supposed malingering. Through his report a mine manager knows before his men go down what places will be vacant.

Natives Are Fair Miners

As a rule the men make fair miners and if properly treated are faithful after a fashion. Harvest time in a country where work is a pastime to be avoided is of course always a period of scarcity in the labor market except with mines large enough to command great resources in recruiting. A "boy" well-treated will nearly always come back to the same mine after the agricultural work is done, and in many cases he will bring others of his own tribe with him. By attending to this point of fair treatment a steady stream of labor can be assured.

Many races go to make up the admixture of "boys" at any mine. All are not always peacefully inclined, and a preponderance of any particular tribe is always a pos-

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*149 Park St., Sydney, Nova Scotia.

sible source of trouble. The larger operators have to put up with this condition as they cannot obtain a sufficient supply of labor entirely from one tribe. Smaller mines, whose requirements are less, are better able to get together boys from one district and to keep recruiting from the same area.

To keep up the supply of labor there is a system of recruiting in vogue. The country is divided, except in the outlying areas, into labor districts, a commissioner presiding over each. The recruiting practically amounts to the employment of labor agents, just as is the custom to a great extent in this country, and is equally as unsatisfactory from all points of view except that of the recruiting officers.

There are various terms of service agreed upon, ranging from six months to three years, the native having the choice in this respect; but once he has chosen, he is expected to stay out the length of time stated in the agreement. As a means to prevent his absconding, full particulars of his name, age, kraal, place of work and latterly in the actual labor areas his thumb prints are taken and registered with the commissioner of the district as being the distinctive marks of a "boy" employed by the mine designated.

The definition of a "boy" is any male native from 12 years of age to 80. Below 12 he is a "pickaninny"; over 80 he vanishes. A boy cannot leave one district for another without a written pass, and no ticket agent can issue a railway ticket without the production of this pass. Careful watch is kept on the coming and going of the natives, and any black man is liable to be asked by any police officer, and in fact in the outlying districts by any white man, to produce his pass. If it does not seem to be correct, he automatically goes to the police station.

Absconding Boys Are Promptly Detected

By these measures any runaway laborer is promptly trailed and the individual transported, even from a new mine where he may have started work, back to the place to which he originally agreed to devote his sole services.

In the coal mines work commences about 6 o'clock and continues till 6 o'clock at night. Usually the forenoon is the best work period. As a rule the native is of slight build, and although wiry, he does not last particularly well; consequently the most coal is obtained throughout the early hours. Depending on the seam and the conditions, an average of about two tons per day is produced per man employed underground.

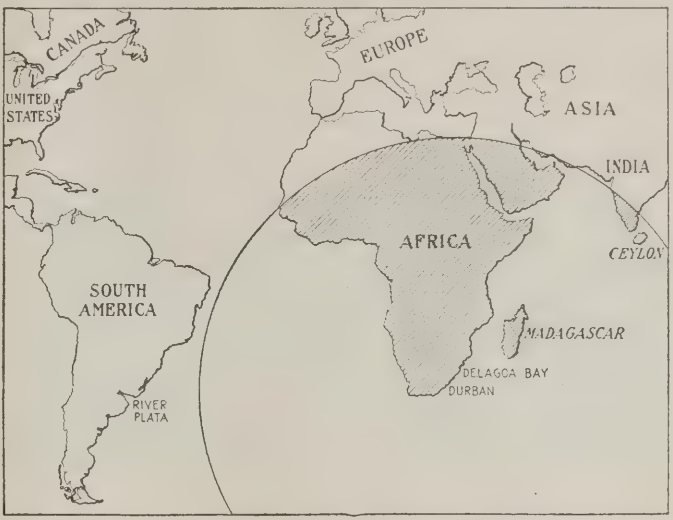
As miners the labor is fairly efficient, and the blacks are by no means devoid of intelligence. There are many tribes who seem to have a liking for machinery, and many good enginemen have been evolved for operating stationary, locomotive and hoisting engines.

It is against the law to have a black hoisting engineer, but nevertheless one sometimes comes across a native hoisting gayly and steadily throughout the day while his white boss and the proper hoistman may be sleeping off the "night before" carousal. To find that the blacks are capable in this respect is all the more creditable, since they have not been taught mechanics. Furthermore the language in use between the white and black does not permit of explanations on the subject of superheated steam or the uses of reversing gears. Consequently the black has to arrive at his knowledge seemingly by instinct and from watching the other man.

Under the conditions described the native exists practically as a prisoner on parole. This or some similar system is necessary, however, in order to obtain some measure of control over the native population. As a rule the black's sense of obligation is conspicuous by its absence, and his nature is largely migratory.

White labor in a black man's country is undoubtedly one of the curses of a manager's life and represents the uncertain element in the South African labor market. As a rule the white man occupies the position of a small boss, and if a good man he is well worth the high wages paid him. Fortunately for the coal-mining districts the proportion of white to black can be held low, under proper management not exceeding 2 per cent.—a fact which helps materially the cost of mining.

These conditions point to a steady labor supply that is cheap and must remain so for many years. As a consequence the South African coal owner can be reasonably sure that at the worst his cost of production will remain much at the same level for a considerable time. Any rise in wages will be slow—much slower than in coal fields operated by a white population. In other countries costs are constantly on the increase, but the South African producer will not suffer this misfortune.



SHADED AREA SHOWS WHERE SOUTH AFRICAN COAL COMPETES WITH THAT OF OTHER COUNTRIES

Mines Are High and Salubrious

The mines in the Transvaal stand on what is known as the high veldt, from 3,000 to 4,000 ft. above the level of the sea, and the climate is healthful. Outcrops of the coal beds are frequent in the "spruits" that cut into the geological arrangement of the rocks, but for the purpose of easy extraction are useless in comparison with other methods. As a rule the angle between the slope of the ground and the dip of the seam, if any, is only a few degrees. Above the coal there is more often than not a porous sandstone, which allows the water to pass through, causing great deterioration of the coal bed for a considerable area at the outcrop.

To reach a good coal from the outcrop usually means the driving of an open ditch up to half a mile in extent, in which the coal would begin as a seam of a few inches of a soft, mushy nature and gradually increase in thickness as the cover increased. As a rule the amount of water encountered is considerable but this depends on the rainfall. Above the seams the rocks are practically sandstone filters, and nearly all the rain water finds its way down through the roof into the coal measure.

The Transvaal coal field may be considered as one made up of thick beds, while Natal is possessed on the average of even a larger number, but not quite such thick seams. The bed most commonly worked around "Whitbank" in the Transvaal is known as the "Great Seam" and runs from 18 to 20 ft. thick. The cover is not great, about 80 to 100 ft., and the problem of the successful extraction of the whole of this coal is still something for the future to solve. No attempt has been made at present to take coal out in any other way than in rooms, 50 per cent. being the average extraction. The roof, commonly a sandstone or perhaps part of the coal itself, stands well, and places are frequently seen 20 ft. wide, 12 to 15 ft. high, without a stick of timber and with the roof perfectly sound.

The quality of the coal varies considerably, and in comparison with better-known seams on the American side of the Atlantic is somewhat poor, but not sufficiently so to disqualify it entirely in any market. The ash is fairly high and the calorific value lower in proportion.

A VIEW OF THE VELDT FROM THE BANKHEAD OF AN AFRICAN COLLIERY

Analyses of a few of the better-known coals from the various districts are given in the accompanying table:

ANALYSES OF A FEW SOUTH AFRICAN COALS

	Moisture	Volatile Matter	Fixed Carbon	Ash	Sulphur	B.t.u.
Cape Colony—						
Stormberg	1.77	9.22	68.44	27.34	0.97	.....
Stormberg	1.50	9.50	68.51	19.70	0.79	.....
Beaufort West...	...	21.7	76.2	2.14	0.86	12,740
Indwe	...	6.92	83.44	7.95	0.87	14,090
Orange River Colony—						
Vereeniging	5.67	23.21	50.94	18.25	1.94	8,950
Vereeniging	5.40	22.48	50.80	19.95	1.26	9,320
Transvaal—						
Springs	3.12	24.94	54.33	16.27	1.45	10,980
Springs	4.59	21.76	52.50	21.5	2.00	9,030
Middleburg	1.37	24.47	51.50	17.20	5.46	9,700
Middleburg	2.38	35.55	60.71	11.46	0.53	12,200
Middleburg	2.22	25.83	57.19	14.76	0.53	11,720
Middleburg	0.41	21.14	67.61	10.84	0.74	13,160
Middleburg	1.59	21.93	60.60	14.83	1.05	10,920
Middleburg	1.95	28.45	58.65	10.95	0.38	11,940
Middleburg	2.05	24.10	60.35	13.50	0.43	11,940
Natal—						
Newcastle	...	19.80	68.88	9.95	1.73	12,490
Newcastle	...	23.56	64.16	10.05	1.38	13,750
Newcastle	1.60	29.10	20.90	10.65	1.50	13,530

The coal measures are usually reached through shafts or, frequently, inclines. The beds are usually fairly level, and an incline driven at an angle of 20 deg. or more reaches most of the measures at a reasonable distance. In this slope either a conveyor or an endless-rope haulage is installed. With the first method, dumping is done underground, while with the latter the cars are hauled up in the usual manner.

This system has at least two important advantages: It dispenses with the necessity of an engineman, which in the case of the endless haul is a white engineman, and secondly, it provides an incline, which is safer than a shaft. Slopes are typical of Transvaal practice where conditions are suitable, but in Natal, with deeper seams, shafts are more common. Extraction is almost invariably by the room-and-pillar method, with small pillars and large rooms. The results of the working cannot be called economical, inasmuch as the percentage of round coal produced is low. The following figures represent an average of what is the usual standard attained by some of the larger companies:

	In the Transvaal	In Natal
Round	43% to 44%	65%
Nut	17% to 16%	15%
Pea and duff....................	14% to 16%	7%
Pickings	26% to 24%	13%

As there is practically no sale for pea, duff or pickings, except a small amount to the power companies at a price around 12c. per ton, the majority of the companies are compelled to dump this material, and as most of the coals contain a fair proportion of sulphur, spontaneous combustion takes place as soon as the heap reaches about 10 ft. in height. The result is that nearly all these coalbanks are on fire and may be seen burning for miles across the veldt.

As the coal district is mainly in a woodless country, the mines have either to import the needed timber or else grow their own supplies, but until the timber growth is sufficient for mining purposes (from 5 to 7 years) present supplies must be bought at a high figure. Tree planting is now being done by many of the collieries.

South Africa Wastes Its Natural Resources

Conservation of the fuel supplies is a subject that has been discussed in the abstract, but like all developing countries South Africa is prodigal of its native resources. In one way this is easily understood, as the country is vast and in many parts practically unexplored; consequently the store of coal appears inexhaustible.

The carboniferous rocks in which the coal beds are found stretch from Laingsburg in Cape Colony in a northeasterly direction 750 mi. to Middleburg in the Transvaal and at right-angles to this from Kimberley to Umtata in Cape Colony, a distance of 350 mi. This gives for the carboniferous system a total area of about 262,000 sq.mi. It is as yet unknown how much of this area actually contains workable coal beds—undoubtedly much of it is barren; but coal is at present being operated in four distinct regions—the Natal coal field, the Transvaal coal field (Middleburg), the Orange Free State area (Vereeniging) and the Cape Colony area (Stormberg). There is a distance between the Natal and the Cape areas of 350 mi.

Last year the Geological Survey of the Union of South Africa gave the following rough estimate of the coal resources:

District	Area, Sq.Mi.	Average Thickness, Ft.	Total Tonnage
Transvaal	5,000	6	36,000,000,000
Natal	1,000	7	9,400,000,000
Zululand	1,250	4	6,000,000,000
Orange Free State.....	1,000	4	4,800,000,000
Cape Basuto-land.....			
Zwasiland			
Total			56,200,000,000

Since the location of new coal fields has little attraction under present conditions for either private or collective enterprise or the state, it follows that as there is no incentive to exploration the foregoing is a conservative estimate and is only applicable to those areas in which actual operations are at present being carried on. Further, it is to be remembered that most of this coal is easily mined, as capital expenditures are low and working-costs even less in their proper relations. Mining-costs, as may be expected, are reasonable and may be held to average roughly for the Transvaal 48c. per ton and for Natal 70c. per ton.

Owing to the excessive competition of past years, through easy production, the price of coal to the consumer is as low as anywhere in the world. For many years this has averaged much as follows, taking into allowance various fluctuations: Round coal, $1.16; pea, 12c.; nut, 70c.—all at the mine mouth, and averaging per ton at the mine possibly 67c. in the Transvaal.

Mines and Railways Use Most of the Coal

Of the coal sold the larger quantity is consigned to the mines and railways on a well-defined calorific basis, while the remainder goes to the householder trade of the few cities—Johannesburg, Pretoria, Lourenço Marquez, Pietermaritzburg and Durban. The total internal (Transvaal) consumption is limited to around 5,000,000 tons annually, little enough to feed an ever-growing number of mines, while the total for the Union approximates 7,500,000 tons. Natal has practically no internal consumption and caters almost entirely to a bunker trade at Durban.

With the easy operation of the coal seams, the price of coal was at first only kept from going lower by the fact that railway routes are few and freight rates high.

Latterly and with various vicissitudes, coöperative bodies—the Transvaal Coal Owners' Association and the Natal Coal Owners' Association—have come into and have gone out of existence. The final success of such a body is always problematical, as their troubles are many in a land where coal mines are easily opened. Such an association is usually a corporate body in which the various companies hold stock. They work along the line of pooling the output to regulate the price and conserving the market for the benefit of the collieries concerned.

Coal is sold to these associations by the mines at fixed prices and a certain stipulated tonnage worked, the total trade being divided among the companies concerned pro rata. Any increase in tonnage sold by the association is also divided, but any increase in price goes to the association's benefit and returns to the mines as dividends on stock. Such a combine, as it has been well named, has been of great service.

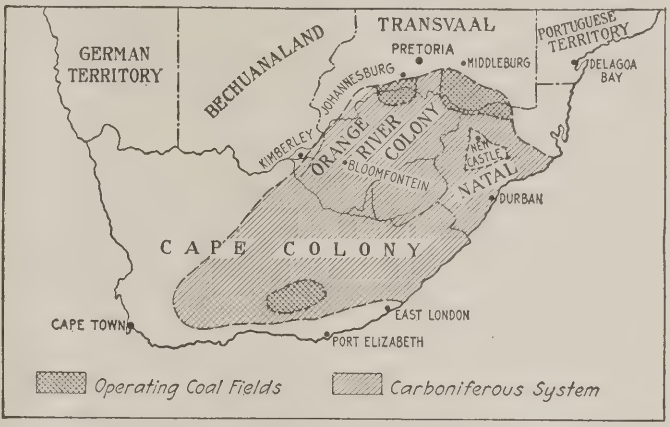
It is a common feature, however, to find within a year or two other operators appearing in the field and demanding their share of the "turnover," and so rifts within the lute develop that may ultimately lead to the dissolution of the association, which then possibly remains in abeyance until matters become so bad as to compel the formation of a fresh combine. This has occurred several times in the history of the Natal and Transvaal fields.

A Combine Has Been an Accomplished Fact

But it is important to note that such a combine comprising a great number of scattered collieries, with many conflicting interests (capital stock in South African, French, German and English hands; control in some cases held by steamship lines, gold-mining companies, diamond companies, independent companies; some concerns 100 mi. nearer the market than others—conditions many and varied), distributed over the huge coal fields in the Natal and Transvaal, has been actually accomplished and operated successfully, and admittedly to the profit of the participants in the pool. Recently there has been discussion of a combine of interests between the Transvaal and Natal, and such a combine, when it takes place, as it probably will, will actually represent an agreement among all the South African coal-mining interests.

Believers in the future of South Africa are great advocates of the development of an export coal trade. The facts that there are such large known reserves of fuel, easily and cheaply worked, and that the internal industrial market—which with the exception of a few cities is mainly the consumption in the gold mines—is not equal to absorbing the surplus production, have compelled a serious study of the question and aroused interest all over the Union.

Export trade for the Transvaal must be conducted through the port of Delagoa Bay, in Portuguese territory, 270 mi. away. Until recently this has been out of the question, as that port had no means of handling an export trade of any dimensions. There now exists, however, a fair coaling plant at this point, and the output of the Transvaal collieries to an oversea market has been going steadily up.



THE AREA OCCUPIED BY CARBONIFEROUS ROCKS IN THE UNION OF SOUTH AFRICA

The coal finds a market in India, against the native-produced fuel, in Ceylon and Madagascar, against Japanese, Australian and British coals; and now that the possibilities of an export trade in this direction have been demonstrated as profitable under present freights and costs, efforts for its increase through increased facilities and closer coöperation may be expected.

The Natal coals find a market through the port of Durban, 240 mi. from the coal fields, and while the output approximates only 3,000,000 tons, by far the greatest quantity (80 per cent.) is taken as bunker fuel. There has been in the past little export trade carried on. Natal coal also finds its way to the Capetown market in competition with Welsh and English coals, but the price obtained is less than for the Welsh coal owing to a lower calorific value. Welsh coal sells at $5.70 f.o.b. Capetown, while Natal coal sells at $4.60.

As already hinted, an export coal trade is a "South African dream." The proposal has been made more than once, and seriously considered within the last few years, that given a community of interest between the countries comprising the Union, Natal coal could find a market on the west coast of Africa and the east coast of South America, leaving the eastern market to the Transvaal.

It was calculated that the coal cost on board at Durban per ton would be from $2.60 to $2.90, and that given reasonable freight rates, this would enable it to compete with the coal at present enjoying the markets above mentioned. As the South African railways are government owned, state aid was to be secured in obtaining lower coal-carrying rates from the coal fields in Natal to the port itself.

There Are No Return Freights

The South American market has looked good to South African eyes for many years, but there is a difficulty which centers round the question of return freights. South Africa and South America are two countries similar in situation, in climatic conditions and in industrial and agricultural progress. The result is that neither country produces any material nor has any industry the product of which the other country needs. South America can send to South Africa nothing in exchange as freight for the returning coal bottoms.

To obviate this difficulty a round trip of the vessels engaged in the trade has been suggested—South Africa to South America, South America to England, and from England back again to South Africa. This is feasible, but on the other hand it is hardly conceivable that the movement of cargoes will so coincide as to allow of the steady invasion of a coal market all the year round.

The relative distance of the ports of coal shipment from, say, Montevideo, is approximately as follows: Durban to Montevideo, 4,000 mi.; Hampton Roads to Montevideo, 5,500 mi.; Swansea to Montevideo, 5,900 mi. mi.

Thus freight rates favor the Union on the distance. Calculating the cost of the coal on board at Montevideo, on the basis of freight rates plus cost delivered at shipping point, the relative selling prices would appear as follows:

	Welsh Coal	Virginia Coal	Newcastle Steam	Natal
Price at point of shipment	$4.50	$2.80	$3.28	$2.95
Freight	3.10	3.60	3.80	2.50
	$7.60	$6.40	$7.08	$5.45

While in no sense can these figures be taken as actually comparative, since freight rates and prices are subject at all times (and especially now) to considerable fluctuations, nevertheless they seem to show that South Africa's claim of being able to reach the South American market at competitive prices is not unjustified.

A Résumé of Conditions

It would therefore appear that, given strong combination, backed by the state, and reduced rail rates, South Africa would have a more than reasonable chance of obtaining a considerable share of the South American trade. Further, a South Africa combine, determined on expansion through export trade, would be a powerful factor in obtaining and forcing the freight reductions necessary, both on the sea and overland. The completion of plants at the coaling ports is a step on the way to the trade desired.

Again, the number of collieries catering under this system to an export trade would have the advantage of assuring quick loading, prompt dispatch and, above all, uniform, well-graded quality. There is nothing to prevent such an association, while there is on the other hand the example of a successful precedent.

The coal trade generally is gradually being forced into the position of having nothing to lose and everything to gain by the consummation of the many-times-suggested combine. The special features brought forward have been:

(a) The pooling of all internal trade and the hoped-for export business.

(b) The allocation, according to production, of the Indian and East African coast trade to the Transvaal mines through Delagoa Bay.

(c) The allocation of the Capetown seaboard, West African coast and South American coast to the Natal mines through Durban.

(d) The construction of strategic railway lines for the transport of export coal and the reduction of freights to the sea from the mines.

(e) The construction of coaling piers at the two ports and the organizing of a shipping fleet.

In a few words, South Africa's feeling is that the Coal Owners' Association, the government and the railways have "a unique and obvious opportunity to promote industrial expansion at the expense of oversea competition." The Union produces cheap, easily worked coal, of which there are great reserve areas, while every problem within its borders can be overcome. The existing mines are equipped for producing approximately 2,000,000 tons annually above their present output, and with an export outlet available production from fresh areas would be prompt.

Only one difficulty bars the way: South Africa is in the same position as the United States in that she has not the vessels with which to carry on her coal trade and has less chance of obtaining them owing to the dearth of return cargoes. It is true that the average quality of the coal is lower than that of the fuels with which it will have to compete, and the export range of any coal depends in these days strictly upon its value as a fuel. But seemingly South Africa has a margin to come and go on in this respect.

Coal in the Russian Caucasus

The coal industry of the Caucasus is in its infancy, but is capable of considerable development. Traces of coal are found in many of the governments of this district. Perhaps the most important known deposit is at Sosooze, in the government of Kars. This deposit covers an area of more than 300 sq.mi., and the coal is reported to be of uniform quality and high grade. Serious prospecting work was started only in 1914. The concessionaire has also been granted a concession for the construction of 60 mi. of railroad from Sosooze to Kars.

The retail price of local coal at Tiflis averaged during the year $9.58 per ton, and the price of Donetz coal at Tiflis in 1914 ran from $22.35 to $23.95 per ton. During December, however, prices rose by 50 per cent. The output of coal in the Donetz Basin increased during 1914 by 19 per cent. and of anthracite by 25 per cent. The consumption of coal by local railroads increased by 22 per cent. Of foreign coal 445,171 tons was imported into Russia for the use of the railroads, duty free, during the first six months of 1914.

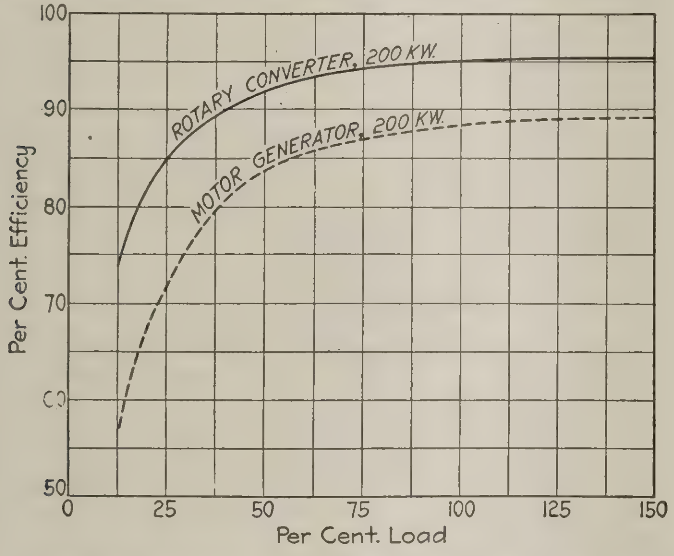
The Rotary in Mine Work

By C. M. Means*

SYNOPSIS—Of the two methods available for converting alternating into direct current the rotary converter of recent design possesses some important advantages over the motor-generator set. Among these are greater simplicity and greater overload capacity.

Direct current is eminently suited for the operation of certain appliances used in the production of coal, while alternating current is the better medium for power transmission. Up to this time, haulage locomotives arranged for alternating current have made little progress, and a successful mining locomotive of this type is not yet in sight. Mining machines are now being built with alternating-current motors, but they have a limited application because of the inherent characteristics of the induction motor.

In small mines where no haulage is contemplated it may be advisable to use mining machines equipped with induction motors, but where haulage is already installed or its future use is possible, it is advisable to consider only machines operated with direct-current motors. Other equipment such as pumps and hoists can be run successfully with alternating current applied at the transmission voltage, or by the use of transformers such voltage can be secured as may be most desirable.



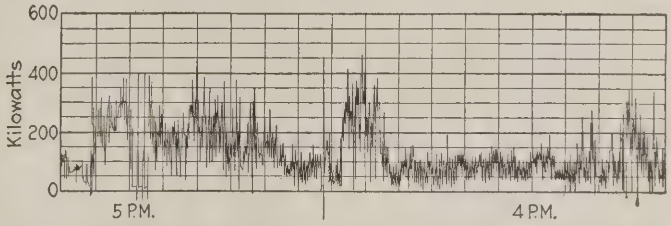
CURVES SHOWING THE EFFICIENCY OF A MOTOR-GENERATOR AND A ROTARY CONVERTER

The potential of direct current is limited to 650 volts, and in the interest of safety it is often desirable to make the limit 300 volts. For transmission purposes underground, alternating current at much higher pressures may be used, the exact voltage being dependent upon the length of the distribution lines and the amount of power to be transmitted.

In order to get proper results in a large mine, it is necessary to transmit the power in the form of alternating current, converting it to direct current for the operation of locomotives, mining machines, small pumps, etc. To accomplish this conversion, we have our choice between the rotary converter and the motor-generator set. In recent years the motor-generator set has been so improved that it is now a rugged and reliable piece of apparatus and has been applied extensively in many districts where alternating current is available. Recent developments in the rotary converter, however, have not only made this device a competitor of the motor-generator set, but present indications point to its adoption in mining work in preference to the other machine.

Machines used for converting alternating into direct current are rated on their ability to carry a constant load rather than to take care of the actual operating cycle of a mine. A mining load is extremely unsteady, and machinery adapted to carrying wide fluctuations should be selected for the conditions existing in the average mine.

In the case of a motor-generator set, the capacity of the machine is limited by the ability of the motor to keep in step or that of the generator to commutate at overloads. The usual practice is to arrange the motor so that it will, under proper conditions, carry well up to 100 per cent. overload, but this implies a normal alternating-current voltage which cannot always be maintained. Manufacturers customarily design the direct-current unit to carry 75 to 100 per cent. momentary overload without serious flashing at the brushes.



WATT-METER CURVE; TYPICAL FLUCTUATIONS OF A MINING LOAD ARE SHOWN

Momentary Overload of 200 Per Cent. Is Possible

In the case of a rotary converter, the only limiting feature of short overloads is that of commutation, and in a properly designed machine it should be possible to carry 200 per cent. overload for short periods of time.

Inasmuch as the overloads are of short duration, no undue heating occurs in the winding of the rotary or of the transformers used in connection with the outfit.

The accompanying chart shows a typical direct-current mining load. In actual practice it was found necessary to use two 150-kw. motor-generator sets to handle this load, yet it could easily have been carried by one 200-kw. rotary converter of proper design.

In certain cases it is possible to arrange the work so as to reduce overloads, but in general an arrangement that would give any material overload reduction would so affect the operation of the mine as to result in decreased output with increased cost. This implies that the load ordinarily encountered in mine work is a fixed condition and equipment must be designed to handle a demand fluctuating between wide limits with a low average value as compared to the maximum. This condition the rotary is eminently fitted to meet.

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*Randolph-Means Co., Pittsburgh, Penn.

The first cost of a rotary converter, together with transformers, designed for a certain continuous load, may be slightly higher than that of a motor-generator set, but the cost of a rotary to handle the average mining load should be lower than that of a motor-generator set to perform a like cycle of work. This is because of its greater overload capacity. The reliability of operation favors the rotary converter of recent design as compared to the motor-generator set. Transformers are extremely reliable in every way, and the rotary has a low-voltage field and armature winding and is one machine.

The synchronous motor of a motor-generator set usually has a high-voltage winding and a revolving field that must be insulated for high induced potentials. The field and armature winding on the direct-current end, in the case of 500-volt machines, must be provided with an exciter. Thus we have two complete machines in the case of 250 volts and three in the case of 500 volts.

The efficiency of the rotary together with its transformers is high, reference to the curves showing just what this value is. When the load under which these machines operate is considered, it is apparent that the saving in power in a rotary is an important item and cannot be ignored. The actual operating efficiency of a motor-generator set on a mining load will be around 70 per cent. or lower, while that of a rotary with its transformers should be 80 per cent. or above.

It is possible to secure considerable overcompounding on the direct-current end of a motor-generator set, while a rotary will give a flat voltage or a very small amount of overcompounding. The direct-current voltage of a motor-generator set is a fixed quantity and cannot be varied beyond the limits fixed by its design. The voltage of a rotary can be varied by changing transformer taps.

A flat voltage is exactly what is required when a substation is located properly with respect to its work. Thus in general, the regulation of the direct-current voltage of a rotary is better suited to the work than a voltage that fluctuates with the load.

The rotary converter operates at about unity power factor, which is ideal so far as this part of the load is concerned. If it is desirable to correct the power factor for other apparatus on the line, a proper condenser should be used and so located as to furnish the maximum amount of effective correction rather than depend on synchronous motor-generator sets placed without regard to location for proper correction of power factor and operated without consideration of the amount of correction required at different times.

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A Cold Winter Coming?

The sale of what are known as fire goods—that is, stoves and furnishings, pokers, tongs, coalhods, stove boards and the like—is always a gamble with the weather so far as the merchants in these lines are concerned. Both the wholesaler and the retailer must place their orders far in advance if they are to have the goods when needed.

The volume of business depends largely upon two factors—the amount of goods carried over by the retailers from the previous season and the nature of the weather in November and early in December. An early cold snap, especially if severe and prolonged, means a great volume of buying by the householder. If, however, the cold weather be delayed until after Christmas, it apparently has no effect whatever upon business.

After Christmas, be the cold ever so pronounced, the consumer evidently makes up his mind to get along with such heating apparatus as he has for the remainder of the season rather than buy new ones. This year the whole body of the trade is banking on a cold winter, judging from the volume of its buying. This judgment has the merit of consistency, since the past three winters have been rather mild and in the general law of averages a cold season is due.—New York *Times*.

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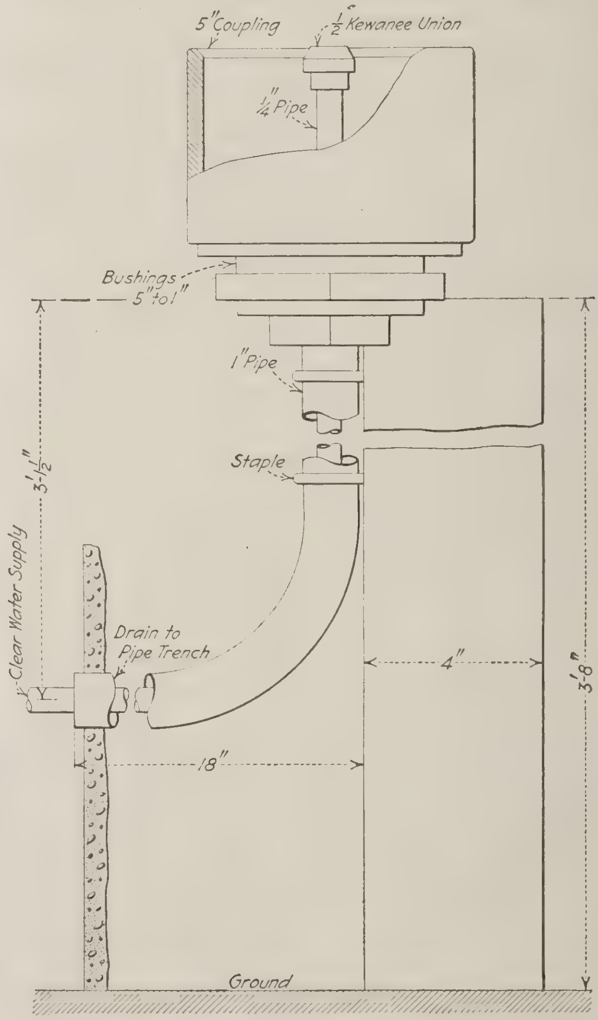
Drinking Fountain for Mine

By D. E. Charlton*

The fountain illustrated herewith is simple in construction, applicable for underground or surface use and may be made from material generally on hand at the mine, says *The Engineering and Mining Journal*. The cup is made of a 5-in. coupling bushed at the lower end and reduced to connect with a 1-in. pipe which acts as a drain, taking care of the overflow of water. The fresh water enters through the ¼-in. pipe that passes through the 1-in. pipe. The male end of a Keewanee union will serve as a suitable nozzle. The apparatus is supported and held to a wooden post by means of staples.



A SIMPLE DRINKING FOUNTAIN

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*Mining engineer, Virginia, Minn.

Simple Cement Testing

By E. H. Bonnet*

SYNOPSIS—Most large consumers of cement employ elaborate tests on this material before using it. This is not generally the case with coal companies. Two tests, one with the thumbnail and the other with a pailful of boiling water, may go far toward determining the adaptability of any shipment of cement for the purpose intended.

Concrete is being used more and more extensively every day. It has long been employed in building construction, but it is only within comparatively recent years that it has been much used around mines. The development of its use in colliery practice has, however, been rapid; and it is now employed in a variety of ways, such as in building bridges, houses, tipples and breakers, as well as to a large extent for engine, fan and pump foundations, brattices, overcasts, entry and tunnel linings and in numerous other capacities where the quantity used at any one time is small, but which in the aggregate constitutes a considerable amount.

The principal constituent of concrete is cement—not in quantity, but in importance. It may seem needless to say that not all cement is good cement. It is, however, not like a great many other materials the quality of which can be determined by sight inspection. A bad cement appears the same as a good one. An adequate test is important, since the uses to which cement or concrete is generally put are such that a failure would entail a large loss.

Most architects, large building contractors and the larger railroads test all the cement they use, but it has been my experience that little of this material used in and around mines is tested. This may be owing in large measure to the cost of having the cement tested and also because of the delay in waiting for the chemist's report. Probably also it arises from a lack of knowledge on the part of mine managers and engineers concerning the importance of testing. To them cement is cement.

I have in mind one coal company which maintains a large and efficient corps of chemists for testing coal, oil and mine air, yet still in an important and expensive structure it used 5,000 bbl. of cement without testing. I have also known of shipments of cement which were rejected by one purchaser, being sent to and accepted by other parties who did not test the cement they used.

The American Society for Testing Materials has formulated some elaborate tests for cement, and all such material should be bought with the specification that it must pass these tests. There are a few simple trials, however, to which cement may be subjected that anyone can apply with simple apparatus and that for all ordinary purposes give dependable results.

Method of Procedure

First a sample of the cement must be secured. The taking of this sample depends largely on the quantity of cement to be tested, but in most cases a small amount should be taken from every tenth barrel or sack in the shipment. These samples should then be mixed together, the total quantity taken being about 10 lb. This should then be thoroughly mixed and about ½ lb. taken for the test.

This should be mixed with water on a piece of glass about 18 in. square and worked, just as bread is kneaded, into a paste of about the consistency of putty. This kneading should take about 5 min. If after kneading, the paste is worked into a ball and dropped a distance of about 2 ft. to the mixing board and water spatters out, the cement is too wet, while if the ball cracks it is too dry. The proper amount of water can be determined with a little practice. It will vary somewhat with different cements, but will ordinarily run close to 25 per cent. of the amount of cement used.

This paste is then made into two pats or mud pies on pieces of glass 4 in. square, the pats being 3 in. in diameter, about ½ in. thick in the center, and running down to thin edges. The pats are then put in a moisture box. This may be easily made. It is simply a box with a fairly tight lid, capable of holding water, with a tray to hold the pats above the liquid. If no moisture box is at hand, the pats can be kept moist by wrapping them in damp cloths.

One pat is from time to time tested for setting. This is done by using the thumbnail. When an impression can no longer be made with the nail, the pat is said to have set. This set must not take place in less than 1 hr. or in more than 10 hr. in order for the cement to pass the test. The other pat is kept in the moisture box for 24 hr., at the end of which time it is placed in a bucket of water. This is then heated and allowed to boil for 4 hr., at the end of which time the pat is allowed to cool slowly and in order to pass the test must show no signs of checking or cracking.

It will be noted that one pat can be used for both of the tests. However, less than ½ lb. of cement should not be used, as any smaller quantity is difficult to handle. A larger quantity than this can be used, if found convenient, and the excess thrown away.

This boil test is one of those used by the chemists and is called the constancy-of-volume test. A cement may pass all the other tests and when used make a fine, firm piece of concrete and still in a number of years begin to disintegrate. It is to determine this quality of the cement that this test is employed. Most of the standard brands of portland cement of today will pass the other tests. Some manufacturers, however, in order to make a cement of great strength mix in an excess of free lime. This adds strength to the cement, but when this class of material is used, the concrete is likely to disintegrate and crumble away after a few years. This variety of cement will not pass the boil test.

In somewhat over 200 samples which I have tested in the last year none have failed to pass the other tests, with one exception, which was too fast in setting. Sixteen samples failed to pass the boil test, however, and were rejected.

A cement which fails to pass this boil test may after aging for 30 days pass it and can then be accepted. A fresh sample must be taken for this test. I believe,

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*378 Twelfth Ave., Columbus, Ohio.

however, that the time for aging is before the cement leaves the factory, and have consequently always rejected this cement immediately. The purchaser is paying for a finished product and should not be expected to store and age a material when this is one of the processes of manufacture.

It will be seen that the only apparatus required in applying these tests consists of several pieces of glass and a bucket, together with some method of applying heat thereto. A glass cutter is convenient with which to cut the small pieces of glass used for the pats, as is also a small pointing trowel with which to work the material on the glasses. The outfit costs less than a dollar.

I might add in closing that I know of some railroad companies that depend almost entirely on this boil test. I also know of a bridge built over the Ohio River, all of the cement used on which was tested in this manner in the engineer's room at the hotel. It is advisable, however, when building any structure involving the outlay of a considerable amount of money that the cement be tested by one who is properly equipped and is familiar with testing this class of material.

Extracts from a Superintendent's Diary

Constantly and in various ways we learn that the outside world has a very poor opinion of our people and their standing in society.

Sometimes it is by word of mouth from strangers passing through, sometimes through letters received in protest of things we have done or are about to do, as reported to the world at large by some metropolitan paper, or again through the actions of people who are called into our camp unexpectedly by business or social necessity.

During the past week the tragic death of one of our citizens brought into our camp a very estimable lady from a distant city, and through her coming we were made to realize how prejudice against mining folk may affect human happiness.

Most of the circumstances in this particular case have only become known to us during the week, notwithstanding the fact that Arnold Cross and his family had lived in our camp for several years. Arnold Cross is the young man who was buried this week, and the lady that came here as a stranger, and by her coming brought out all of the facts, was Arnold's mother.

Ten years ago Arnold Cross, then a young man just out of college, accepted a position as school teacher in a Pennsylvania mining-camp village. Two years later he fell in love with a miner's daughter and married her.

Arnold's mother was a widow of some means living in Boston. She had never visited a mining camp, but with the prejudice so characteristic of city folk she assumed that her son had brought disgrace upon the family name—a name which had been prominent in Massachusetts history for several generations—and true to the traditions of her forefathers she disinherited the son.

In a few years Arnold tired of teaching and decided to learn the mining business.

His father-in-law, a thrifty coal digger, gave him the opportunity by taking him in as a "buddy." Within a few months his earnings were larger than the salary he had received as a teacher, and he never regretted the step.

After getting practical experience, he made up his mind to prepare himself for the mine foreman's examination, and at the next session of the examining board he passed with a high mark; but the length of his experience would not permit him to obtain a certificate, so he came to our state, where the requirements were not so severe.

He accepted a position at our camp as assistant foreman and was in line for promotion to a foreman's job with the next vacancy.

Marrying a miner's daughter was bad enough from his mother's standpoint, but accepting work in the mines was past understanding, and from the time he went to work in the mines his mother even refused to correspond with him.

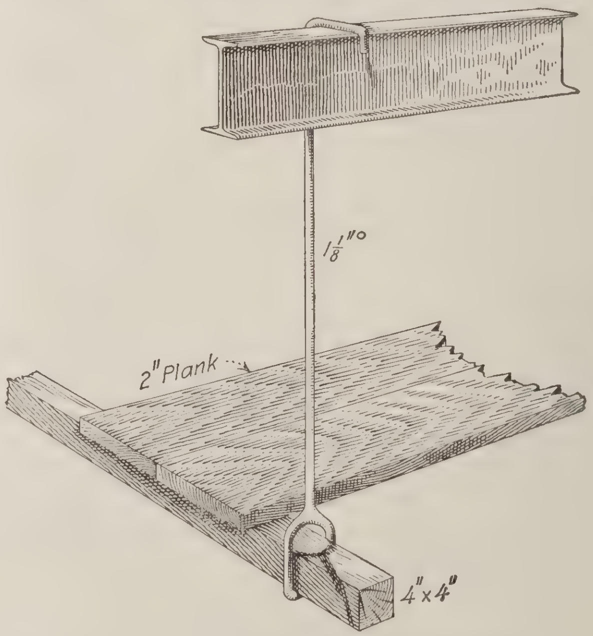
One of those unaccountable explosions of a small gas pocket where gas was never expected snuffed out Arnold's life last week, and his mother's arrival in our camp was in answer to a telegram announcing his death.

We have had the unhappy lady as a guest at our house during her entire visit, and it fell to my lot to make her realize that her son had followed an honorable occupation, had acquitted himself with credit in that occupation and left behind a wife loved and respected by everyone in our village and of whom any family might well be proud.

That I did my work well is evidenced by the fact that Arnold's wife is to go to Boston with the mother to make her home there for an indefinite period.

Staging Hangers for Riveters on Structural Work

Slinging a staging for riveters on structural ironwork, says *The Engineering and Mining Journal,* is too often done with ropes, which for this purpose are both unsatisfactory and unsafe. A cheap and convenient hanger, shown in the accompanying sketch, is made of 1⅛-in. round iron, with a large eye at the lower end and a hook at the upper end to hook over the I-beams or other structural members. Through the eye is inserted a 4x4 timber on top of which 2-in. planks are laid. The cost of these hangers is small, they are light and can be handled easily, and they are not liable to destruction.



STAGING FOR STRUCTURAL IRONWORKERS

Some Technical Aspects of the New York Specifications

By Reginald Trautschold*

SYNOPSIS—An analysis of the causes leading up to the reason for the adoption of the more rigid specifications. The requirements of the new proposals can only result in higher bids to protect against penalties. Methods of sampling and analysis are open to criticism.

The revised specifications for the purchase of coal by the various departments of New York City are truly remarkable in their impracticability, their radicalism and their injustice to the dealers, and this in spite of the fact that they are the result of months of work on the part of a special committee representing the largest coal-using departments, assisted by the Bureau of Standards of the Board of Estimate and Apportionment. They were taken up because the rather drastic specifications adopted some four years ago failed to satisfactorily protect the city's interest.

The city discovered that under the old specifications it was paying more for coal and receiving consignments of a poorer quality than certain individuals and private corporations. A more careful investigation by the committee might have traced the trouble to failure to secure widely competitive bidding between reputable dealers owing to the severity of the old specifications. Instead of which, though the committee rightfully came to the conclusion that the fault lay with the old specifications, they proceeded to make these still more exacting, apparently hoping to lower the cost of coal by demanding that it meet much harder conditions.

Price Governed by Demand

The price of coal, like that of any other commodity, is governed by the law of supply and demand, and if the city has paid higher prices and received poorer coal than others, it has been because this incontrovertible law has been further complicated by the insistence of the right of selection. Coal dealers are not necessarily less honest than other merchants and if not burdened by too many conditions will serve the city as well as they do other customers. The value of the coal they have for sale is fixed by the general demand, and if this is interfered with by the insistence of the right of selection and condemnation, it is only to be expected that a higher price will be demanded or a poorer quality supplied.

To return to a consideration of the new specifications, the most glaring handicaps have been imposed on the steam sizes of anthracite, such coals being those purchased most extensively by the city.

The specifications for broken down to pea have not been altered so much as to cause any very great injustice. It is in connection with the smaller washery sizes of anthracite that the drastic changes occur. In the first place, the heating and ash-contents requirements of the buckwheats have been reversed—No. 3 being ranked first, then No. 2, and No. 1, which has always been considered one of the best anthracite steam coals, listed last, with requirements similar to those for buckwheat No. 2 under the new specifications.[1] The heating value and the ash contents required of buckwheat No. 3 are the same as those for pea coal, while the specifications for buckwheat No. 1 in respect to ash, volatile, sulphur and heating value remain the same as under the old specifications, the only change being an increase of 1 per cent. in the allowable moisture.

How the arbitrary decision of the city that the buckwheat No. 3 should rank as high as pea in heating value and as low in ash content, while buckwheat No. 1 may possess nearly 1⅔ per cent. less heating value and contain 12½ per cent. more ash can alter the logical ranking of the buckwheats is hard to see. Such arrangement is much to be desired, and if it can be brought about by the new specifications, the committee will receive the unqualified indorsement of all coal men.

Penalties and Bonuses

Coal failing to meet the new specifications is penalized most severely; deductions in the gross amount of coal paid for are made both for ash content greater than the very low allowable percentages permitted and for any decrease in heating value below the specified requirements. The presence of ash being directly measured by a decrease in heating value, it is actually penalized twice—once for its presence and again for its effect upon the value of the fuel.

The penalty for ash in excess of that allowed under the specifications is a reduction of 1 per cent. in the gross weight of the coal for each 1-per cent. increase in ash up to a maximum of 2 per cent. more than allowed under the specifications. Any further increase is taxed 2 per cent. for each additional 1 per cent. of ash.

Failure of the coal to possess the heating value demanded is penalized by a reduction of 1 per cent. in the gross weight of coal for each 100 B.t.u. for the first 300 B.t.u.'s deficiency, after which the penalty is increased to 2 per cent. for each additional 100 B.t.u.

A lamentably weak attempt to equalize the extremely severe penalties is made in the way of bonuses. These are proposed for deliveries of coal superior to that demanded, but are simply to be remissions of penalties imposed on other deliveries under the same contract at the same unit price. Such remissions are to be credited at the rate of 1 per cent. for each 100 B.t.u. in excess of the number called for in the specifications. No bonus is offered for a reduction in the allowable ash content, although any excess carries a double penalty, nor are the remissions to be credited against any penalties imposed at the rate of 2 per cent.

The unfairness of the penalties and the inequity of the remissions may be better shown by means of an assumed transaction. For instance, a consignment of buckwheat

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*39 Charles St., New York City.

[1] For tables showing required analysis, see Vol. 8, p. 132.

No. 3 might be required. According to the new specifications, such a coal should show 12,400 B.t.u. per lb. and contain not more than 16 per cent. ash. It may safely be assumed that such coal is of a high grade that can be obtained at least occasionally. It is not at all unlikely that the analysis of the sample taken from a delivery would show the presence of 19 per cent. ash, which is the allowable percentage of ash for this grade coal under the old specifications but an excess of 3 per cent. under the new regulations and subject to a total penalty tax of 4 per cent.—1 per cent. for each of the two first 1-per cent. excesses and 2 per cent. for the third 1-per cent. excess. Assuming that the analysis was really typical of the mass of coal furnished on this specific delivery—a condition that would be problematic, but which should be admitted for the sake of the argument—the presence of 3 per cent. excess ash would markedly reduce the heating value of the coal.

ASH REDUCES HEATING VALUE

It is a fact well-substantiated by practice and confirmed by numerous authentic tests that each 1 per cent. of ash contained in coal of this grade reduces its heating value by $1\frac{1}{4}$ or $1\frac{1}{3}$ per cent. If buckwheat No. 3 containing 16 per cent. of ash possesses a heating value of 12,400 B.t.u. per lb., the presence of 19 per cent. ash would reduce the heating value approximately 500 B.t.u., other constituents of the coal remaining about the same and assuming the greater loss owing to the presence of the excess ash ($12{,}400 \times 0.01\frac{1}{3} \times 3 = 496$ B.t.u.). A lack of 500 B.t.u. per lb. would entail a penalty of 1 per cent. for each 100 of the first 300 B.t.u. and 2 per cent. for each of the other 100 B.t.u., making a total penalty owing to the presence of excess ash of 7 per cent.

The total penalty imposed on the delivery would then be 11 per cent.—4 per cent. for the presence of the excess ash and 7 per cent. for its effect. A remission of 5 per cent. would be all that would be possible for the dealer to secure, no matter how superior might be the coal delivered on the balance of the consignment at the same unit price, for the 2-per cent. penalties would not be subject to any remissions.

Competition in the sale of coal has driven the ordinarily obtainable profit down to about 10c. a ton. With buckwheat No. 3 commanding a price of \$3 per ton delivered, this represents an obtainable profit for the dealer, should his coal meet the new city specifications, of $3\frac{1}{3}$ per cent. A large portion of the coal delivered by the dealer on his consignment having perforce to bear an unavoidable penalty of 6 per cent., owing to the presence of a little excess ash for which he is not allowed to make recompense by other deliveries of higher-grade coal, it is difficult to see how he can avoid adding at least 10 or 15c. to the price he charges less-exacting customers for the same grade coal.

Such a transaction would not be at all unusual, no exaggerations nor improbable assumptions having been made; so it is extremely difficult to see how New York City or any other customer can benefit by the adoption of any such impractical specifications. Only one result can follow their enforcement, and that is a very decided falling off in the number of competitive bids received and a marked increase in the unit price that the city will be compelled to pay for its coal.

Aggravating still further the injustice imposed by the heavy penalties is the strong probability that the taking of samples for analysis may not be fair and the results shown not typical of the mass of coal. There has been no uniform system or method of sampling coals at the Central Testing Laboratory, or for that matter anywhere else, and remarkably apparent variations in the quality of the coal in the same consignment have resulted. There have been instances of reported variations as great as 1,000 B.t.u. in the heating value of coal in two deliveries made to different parts of the city, both of which were made from the same shipment.

Scientific methods of purchasing commodities have done much to better market conditions and to protect the purchaser from unscrupulous merchants, but so-called "scientific buying" can be overdone. Any such specifications as those proposed to govern the future coal purchases of New York City, if they are supposed to be drawn up along scientific lines, promise nothing but dissatisfaction and a heavy unnecessary expense to the city. If New York City will rely more on the common honesty of the coal dealers, use more common-sense and less misapplied scientific effort, and accept the incontrovertible law of supply and demand, unburdened by any reservations, it will not only fare better, but go farther.

Ballads of a Coal Miner--VIII

Written expressly for Coal Age · BY BERTON BRALEY

I AIN'T *such a wise guy at dopin' things out,*
But one fact I'm reas'nably certain about—
We're wasteful in minin', there isn't a doubt.

We waste at the breaker an' waste in the sump,
We waste in the entry an' waste at the pump,
We waste on the cages an' waste on the dump.

We use too much powder, yet leave too much coal
That's wasted forever—no good to a soul;
We leave it down deep—an' we fill in the hole.

With hurry an' haste as the motive that drives,
We're wasteful of labor an' wasteful of lives,
An' wasteful of tears of the children an' wives.

If only we'd see it, if only we'd turn
An' look ourselves over, in time we might learn
To mine with less waste an' more carbon to burn.

For there ain't no use talkin', we waste at the sump,
In tipple an' breaker an' down at the pump;
We waste in the tunnels, the shaft an' the dump.

The Labor Situation

SYNOPSIS—Attempts are being made to unionize Colver, Cambria County, Penn. In Ohio the coal operators are trying to divorce the railroads from the mines. West Virginia operators defend their position. Colorado Fuel miners are well disposed toward the Rockefeller agreement.

On Oct. 14 the 600 men of the Maryd colliery of the J. S. Wentz Coal Co. went on strike because the company refused to recognize their grievance committee. In the Maryd mine gas has compelled the introduction of safety lamps in the middle district gangway, and the miners believe they should be compensated by an increase in yardage for the greater difficulty under which they perform their work. The strike was declared at an end on Oct. 22. The Brockton, Tuscarora and Maryd locals were all interested, and the first two were not satisfied with the way in which the Maryd local handled the situation. The Tuscarora local was then allowed to represent the men. Arthur Kennedy, the mine superintendent, declared that he would not discuss matters with the committee till the men returned to work, as the agreement required that operation should not be suspended. Ultimately the men agreed to work, as in duty bound, pending a settlement.

JOHN D. ROCKEFELLER, JR., AND SOME CITIZENS OF TRINIDAD, COLO., ABOUT TO VISIT FREDERICK MINE

Rockefeller is the man in the center of the group, with crossed legs and arms. E. H. Weitzel, the general manager of the Colorado Fuel and Iron Co., is the individual with the smiling countenance with his back to the window

An Attempt to Unionize a Cambria County Mine

Colver is a large mining town not far from Ebensburg, the county seat of Cambria County. A fine grade of low-volatile coal suited for naval use is produced, and the mines have shown much activity during the recent slack period, owing to the exceptional quality of the coal marketed. Apparently an attempt has been made recently to unionize the mines which have hitherto been nonunion.

Charles O'Neil, the vice-president of district No. 2, which includes all central Pennsylvania, declares that he and other officials of the union, including William Welsh, went to Colver, and while at dinner in the Colver Hotel saw certain state troopers. He states that the troopers were called on one side by the Ebensburg Coal Co. officials and later left the hotel, as if to give the mine guards a free hand.

O'Neil declares that on withdrawing to the hotel office the blinds were drawn and the doors were locked, and several mine guards having been called in, the union men received a severe mauling. Later O'Neil and Welsh, according to the former, were put in an automobile, escorted from the town and told that if they ever came back they might not leave in as good a condition as they entered. O'Neil states that some of his teeth were knocked out. The company officials are said to have declared that the union men were asked to leave town, and on being seized by an officer O'Neil resisted.

The relations between the railroads and the coal companies have always had much to do with the labor situation, and especially is this true in Ohio. Consequently it may be excusable here to introduce an account of the litigation between J. S. Jones and two of the main railroads passing through the coal regions of Ohio.

The present owner of the Sunday Creek coal properties, the Sunday Creek Coal Co., of which J. S. Jones is principal owner, is endeavoring to divorce the railroads from the coal companies as a means of removing discrimination. United States Judges Warrington, Denison and Knappen, sitting as a special Federal District Court Oct. 9, presided at another round of the battle-royal between the Sunday Creek Coal Co., the Hocking Valley Ry. Co., the Toledo & Ohio Central Ry. Co. and the attorneys for the Government. The hearing was really a prolongation of previous hearings when the entire case of the railroad control of large coal lands in Ohio and the purchase of the Sunday Creek Coal Co. holdings by J. S. Jones were aired.

Early in the hearing, government attorneys surprised the court by petitioning it to compel the railway companies to dispose of their interests in all coal companies concerned in the former Government suit. This petition was simply asking the court to enforce its former decree providing for a complete divorcement of the railway and coal companies in the State of Ohio. The stocks and bonds, which the Government attorneys would have the railroads in question sell, consist of certain securities of the Ohio Land and Ry. Co., the Buckeye Coal and Ry. Co., the Boston Coal Dock and Wharf Co. and about $190,000 in the stock of the Kanawha & Hocking Coal and Coke Co., all of which is owned by the Hocking Valley Ry. Co.

The petition also asked that the Toledo & Ohio Central Ry. Co. be ordered to dispose of its stock in the Imperial Coal Co., the National Coal Co. and all interest in certain coal properties now leased by the Sunday Creek Coal Co. Counsel for the railroad claimed that the National Coal Co. went out of existence in 1912 and that its holdings were taken over by the Imperial Coal Co. He also said that, at the same time, the Imperial Coal Co. reduced its authorized capitalization from $300,000 to $100,000. The attorney, however, admitted that there were certain coal properties owned by the Toledo & Ohio Central Ry. which are under lease to the Sunday Creek Coal Co.

The court also considered a modified contract of sale filed by the Hocking Valley Ry. Co. providing for the disposition of certain lands in Ohio to E. M. Poston. The lands in question are leased to the Sunday Creek Coal Co. The former contract submitted for approval by the court was modified to the extent of having all of the old bonds of the Ohio Land and Ry. Co. and the Buckeye Land and Ry. Co. canceled and new bonds issued in their stead.

This proposition was made providing that J. S. Jones, of the Sunday Creek Coal Co., would enter into a new lease for the mining of a minimum of 500,000 tons yearly at a royalty of 8c. per ton. The railroad company contends that at present no minimum is fixed in the lease and that Mr. Jones is in a position to destroy the value of the coal lands to the stockholders and the bondholders. It is also claimed that the Sunday Creek Coal Co. is not mining the coal in the proper manner. These allegations are followed by a request that the lease to the Sunday Creek Coal Co. be canceled by the court.

ARDINE DENNISON, MINERS' REPRESENTATIVE; W. L. MACKENZIE KING AND JOHN D. ROCKEFELLER, JR.

West Virginia Fears Freight Increase

West Virginia seems to be a unit in demanding that coal freights shall not be raised. The West Virginia operators feel that many of their advantages which the Ohio operators emphasize in print are offset by many drawbacks. They allege that the longer hours and lower pay of their day hands are balanced by the low efficiency of mountaineer labor. The native workmen of the Appalachian chain eat little and are able to do little, and such food as they do eat is of the least nourishing kind. The domestic science classes in various parts of the state are just as much a reflection of that state of affairs as they are of the practical philanthropy of the operators; for the work was really made necessary by the manner of life of the men. The low tonnages of the West Virginia mines have been similarly credited to the inefficiency of the day hands.

When confronted with the greater output of the miners per man, the operators answer that the coal is far thicker and far easier to dig in West Virginia than in Pennsylvania and that the foreigners, who are better than the mountaineers, are mostly working at the room face and so keep up the efficiency of contract work even though that of day work falls to a deplorable level. Besides it is stated that the tonnage per man in western Pennsylvania is higher than is recorded, because the return, while supposed to be based on the coal produced, is really usually only a record of the coal for which the miners receive pay. Because in the Pittsburgh region the miners are paid only for lump coal passing over a 1¼-in. screen, which is the scale agreement, there should be a large addition to the output of machine coal as recorded if the actual coal produced and shipped is to be obtained. This perhaps would add 33 per cent. to the machine coal and not a little to the hand-picked material.

Consequently the talk of greater efficiency per man is thought to be fallacious. The production per miner per working day in West Virginia in 1912, as given on page 814 of Vol. 7, was 6.84 tons. The same figure for Pennsylvania bituminous was 5.61. West Virginia's recorded output per miner is 22 per cent., therefore higher than Pennsylvania. According to some people, this can be largely accounted for by the difference between the coal actually mined and that which is credited to the miner in Pennsylvania. It would be interesting also to know if in West Virginia the operators are basing their recorded outputs on railroad shipment weights or on the accredited weights of the cars dumped where the coal is not weighed on the tipple.

The miners in Las Animas and Huerfano Counties in Colorado, where much of the plant destroying took place during the great mine strike, seem to be convinced that the agreement offered by the Colorado Fuel and Iron Co. would assure them of desirable working conditions. Tabasco, which is only 3 mi. as the crow flies from the unfortunate town of Ludlow, voted 138 against 25 for the agreement. Berwind, which is 4 mi. from the same junction point, voted 140 against 9 in favor of the Rockefeller-King instrument. Other camps somewhat more remote voted as follows: Rouse, 139 for, 6 against; Lester, 97 for, 9 against; Cameron, 128 for, 0 against; Ideal, 88 for, 0 against; Walsen and Robinson, 276 for, 35 against; Primero, 186 for, 22 against; Morley, 142 for, 28 against; Frederick, 190 for, 18 against; Segundo, 125 for, 15 against; Sopris, 221 for, 63 against; and Gulch, 60 for, 0 against.

Attitude of Union Toward the Agreement

The union, speaking through John R. Lawson, international board member, does not of course approve of this agreement, principally because it leaves the union out. The miners, he says, want not charity but justice, which apparently means that, according to Lawson, they seek not so much fair working conditions as an opportunity to rake up imaginary grievances. If they have fair treatment they surely need not seek to keep in operation those elaborate state-wide and nation-wide organizations by which protest is cultivated when no real grievance is apparent.

Under the plan any real difficulty has ample chance for settlement. The mechanism for protest when perfected invariably leads to protest whether there are any wrongs to be righted or not. This mechanism is not allowed full development in the agreement; for the employees, while they have their private meetings at the camps, meet the employees of other camps only in joint committees with company men.

Robert H. Harlin, Percy Tetlow and James F. Morgan, representing the international executive board of the United Mine Workers, in a statement issued Oct. 2 called attention to the fact that the plan fails to provide for meetings of miners except locally, and all meetings except those which are local are to be attended by an equal number of company officials, "thus eliminating the danger of the collective action that might result if men from several mines met together, free from company influence."

John R. Lawson Is Admitted to $35,000 Bail

On Oct. 7 John R. Lawson was admitted to bail in the sum of $35,000, and this security being promptly furnished by the union he was set at liberty. Apparently the cases against the strikers will be pushed forward to trial. Governor Carlson urges that while lenience might at present restore peace in Colorado, it would only foster trouble in the future by creating the impression that by making a sufficient disturbance the friends of lawbreakers can always induce the withdrawal of prosecutions.

The trial of Nicholas Dormas, a Greek coal miner charged with the deliberate murder by shooting of William Dick during the great mine strike, was commenced Oct. 16. Mr. Dick was conveying the pay of his men by automobile to his Oakview mine west of La Veta when the crime was committed. Owing to the precautions made by Mr. Dick the criminal failed to find the cash secreted in the machine, but though he did not profit by his venture he was successful in escaping to Utah, where, however, he was apprehended later. His accomplice, Vardis Marinos, another Greek, is under indictment for the same offense and his trial will follow.

Editorials

The Loss of Wealth Resulting from Idle Time

It is important that we should lay seriously to heart the wealth lost to the nation by idle time. The hours we deliberately devote to pleasure have their helpfulness, but the time during which we are forced to be idle rests neither body nor mind. At such times we simply drift along without purpose and establish bad habits which leave us permanently weaker.

The yearly average of days of activity in the mines of the United States from 1908 to 1914 was 217. Thus the mining plants averaged only about 72 per cent. of full time. In the year 1914 the number of working days, according to United States Geological Survey report, was only 207 for all coal mines throughout the country.

Unfortunately even this time is not by any means evenly distributed. Some mines are idle a large percentage of the year, while others work with regularity. A few mines in agricultural states work mostly in the winter, and in the summer the men must find farming jobs to keep them busy, though it is doubtful whether many of them do. A miner is not always willing to work under a hot sun. Arkansas and Oklahoma in 1913, for instance, only worked 174 days, or barely 55.5 per cent. of the possible working time.

Perhaps under no circumstances will it be possible to keep coal mining at an even pace throughout the year, but surely it will be possible in the future to do better than in the season just past. Such depression as occurred last year would be helped by a combination embracing all the mine operators, but the conditions of unemployment were nation-wide, and something broader than a combination of mine owners would be necessary as a stabilizer. The whole nation must get together to produce a stability in business which will make steady work in coal mines and in every other form of activity.

It will be necessary for our citizens to learn that a wrong too rapidly righted introduces another wrong, just as an automobile pursuing the wrong path if too suddenly steered into the right direction may keel over. Such changes of helm as we have had in past years would make the stanchest of craft travel heavily.

There should be no violent modifications in tariffs, whether on railroads or at ports. Every readjustment upsets business. Perhaps some industries do need to be readjusted, but the work should be done slowly so that labor can move to a more suitable location; so that capital rather than being withdrawn may not be further expended in those industries that are based on unfair economic conditions; and so that those who have made bona-fide loans to certain industries based on conditions found to exist may not, when the conditions are being corrected, lose the money they have put out at interest. The 15c. increase in railroad tariffs schemed for the coal business in West Virginia should be divided over at least three years, and the reduction of the anthracite tariff, recently ordered by the Interstate Commerce Commission, should have been spread over an even longer period.

If an industry is based on a certain tariff, national or industrial of any sort, any change in it should be gradual, so that business in general should not feel the jar. There is no other country where business travels so by jerks or where the fluctuations of industry are so great. For a time our commercial activities sail along merrily. The rich man makes a fair profit. Someone thinks it excessive, and it is cut down. Immediately the rich man ceases to have ready money, and he cannot make improvements, build railways or factories, and as an equally immediate result that portion of business which depends on the new work started by such rich men suffers and is idle.

The coal business depends on the railroad, the brick and like industries. Granted a stagnation owing to the lack of earnings to create new capital; granted a lack of desire to invest because opportunities are suddenly far less appealing in the forms of investment which each capitalist understands or because the profit is seen to be lower than before or less than what is confidently expected in the future; granted a fear to invest because of all the dire things the fear of other failures creates—then all that part of business based on progress and not on diurnal needs will utterly disappear.

That is what has happened to the coal business in the past year. Let us have reformation wherever it is needed, but not revolution. There is need for a steady hand upon the wheel, that will guide us safely and not spill us over in the road. Perhaps we may steer toward the wrong town, but if we veer slowly rather than turn abruptly, we shall certainly not upset by the way.

The coal business is suffering from the foolish restrictions placed on other industries. But the coal men are themselves partly to blame. The operators were the leading baiters of railroads about car shortage and were among the first to leave the railroads with empty cars on their hands in the stagnation that followed. The coal shipper had no more right to insist on the railroad having cars for all possible shipments than the railroad would have a right to demand at any moment the delivery of an unreasonable amount of coal. Neither a railroad nor a producing company can afford to use its capital intermittently so as to meet all kinds of unreasonable demands of merely temporary duration.

But unreasonable as they are, we make all kinds of suddenly exercised restrictions; we lay burdens on commerce which, all unexpecting, commerce cannot meet; and then we wonder why in 1914 our coal trade was not 66 per cent. efficient.

If that 33 per cent. of loss could only be salted down, how wealthy we would be! If that time, instead of being devoted to loafing around stores and bar-rooms and making home unpleasant, had been conserved for the building of homes, the making of railroads and the erection of factories, we might well be a richer and happier people.

But we go on destroying industry by our coquettish moods. We question how and what we should build, but we recognize that first the site must be cleared. So we tear down and leave the building for a later day. In the future we shall imitate the gardener who when he would bend a tree or a limb does it gradually week by week so that he does not strain the limb too severely and break rather than bend it.

Company and Other Stores

In making a general summary of the bituminous coal census in 1909, the United States Bureau of the Census says:

> In the United States as a whole the total expenses reported for mines without coke manufacture amounted in 1909 to $301,451,896 and the total value of products to $315,894,935, showing a difference of only $14,443,039, or about 5c. per ton of coal produced. In Arkansas, Iowa, Kentucky, Oklahoma, Oregon, Tennessee, Virginia and West Virginia the expenses reported exceeded the value of products. For mines with coke manufacture . . . in Kentucky, Tennessee, Virginia and Washington the expenses reported . . . exceeded the value of products.
>
> These data cannot be taken as showing accurately the amount of profit or loss in the coal-mining industry of the several states, but they do seem to indicate that in many states the industry obtains only a very low rate of profit, if any. It should also be noted that many operators make a considerable profit by renting houses and selling merchandise to their employees. The Bureau of the Census corresponded with many operators whose returns showed an excess of expenses over the value of products, and not a few of them stated that while there was a loss in their coal-mining business proper this was more than counterbalanced by profits from selling merchandise and renting houses.

The remarks about stores and houses may appear a damaging indictment against the coal operator, but surely because the mine owner has lost money in coal production is no reason why he should lose it in all his other ventures, allied or unallied. The company store really stands the most favorable comparison with the city store, and the house rents at the mine will not suffer when contrasted with those of the country village. Of course city rents for obvious reasons are considerably higher than those in the country or at the mine.

Merchandizing in the cities has produced some of the largest of fortunes, and these were usually made in a single generation. It is only necessary to mention such men as Wanamaker, Altman, Straus, Field and Stewart to show that the profits of merchandizing in the open market are quite frequently extremely large, and it is questionable if they are nearly as great in mine stores.

In large towns the operators' stores have to meet competition of the fiercest kind, and they frequently succeed so well in doing it that they take away the bulk of the business from the local merchants, owing to the fact that they have a large trade absolutely secured from bad debts and of a volume which can be relied on. In the little mine villages the difficulty in obtaining men makes the operators chary about asking high prices.

The profits on store sales need not be high to return a large income. Almost the whole wage of the miner forms the basis for that profit. The larger part of it is spent at the stores and for house rent, and the income from the sales and rents might justifiably be nearly 75 per cent. of the profit which should be, but is not, made by mining coal.

Why should an operator be prevented from profiting from 42 per cent. of his aggregate business in such a degree as to make up for what he loses on the other 58 per cent., so long as his profit on the smaller part of his business is not unreasonable? In justice to the United States Bureau of the Census it must be conceded it does not suggest any such conclusion, but some of the critics of the coal business having taken away the coat of the operator would take away his cloak also.

Horse Sense vs. a Technicality

Of recent years some of the constructions placed upon workmen's compensation acts by the courts are "fearfully and wonderfully made." Damage suits to obtain compensation for injuries sustained in mining accidents have often resulted in the award of large sums to the person injured, purely and solely because the compensation law removes the common-law defenses of "contributory negligence" and the like. Much injustice has thus often been suffered by the operator or mining company.

A notable exception to this general rule has recently come to light in West Virginia. It appears that a mine employee removed from a drill hole a stick of dynamite with a lighted fuse attached and was "injured" in the explosion which followed. This workman brought suit for damages against his employer, alleging in substance that he had not been warned of the danger of intimate physical association with dynamite about to explode.

Strange as it may seem, this man won his suit in the lower court and secured a verdict for damages. Unfortunately for him, however, the mining company saw fit to appeal the case. The supréme court reversed the decision of the lower tribunal, holding that while the compensation act was valid in denying to employers under certain circumstances the common-law defenses of the assumption of risk and contributory negligence, the failure to warn a man of mature years and in full possession of his normal reasoning faculties of the danger of withdrawing from a drill hole a stick of dynamite attached to a lighted fuse did not constitute negligence on the part of the employer.

That the man was injured by the explosion there was no question; that there was no reasonable excuse for such an injury appeared equally obvious. In this day and age every adult knows that dynamite is explosive and that its neighborhood when it is on the verge of detonation is no place in which to tarry. No employer should be taken to task for failure to warn a man of a danger of which he and every other normal human is fully cognizant. This is a common-sense decision, and it is to be hoped that we may have more such in the future.

A Soft Spot in the New England Market

The New England coal trade inland from Boston, Portsmouth, etc., has shown some interesting developments during the week. Two or three of the distributors have been in lively competition for 1916 contracts, and a flat price has been named in some instances.

If current rumors are verified, contracts have been closed at prices down to $3.50 f.o.b. Boston for a term lasting until Apr. 1, 1917, and this is not a favorable prospect from the operators' standpoint. It will probably mean that $2.85 f.o.b. Hampton Roads is still too high a basis to be consistently maintained. The old cry of "too many agencies" may again be raised.

Sociological Department

Intercompany First-Aid Meet in Somerset County

SYNOPSIS—In Somerset County an important first-aid meet was held by the Y. M. C. A. and the mine operators, with the aid of the state mine inspector. A mining institute meeting preceded the contest.

The Third Annual First-Aid Meet of Somerset County was held Sept. 4 in Boswell, Penn. This meet was promoted by the mine operators, the Pennsylvania State Y. M. C. A., State Mine Inspector F. W. Cunningham and the United States Bureau of Mines. George B. Landis, of the state Y. M. C. A., was the leading spirit in the promotion of the contest.

A distressing explosion of gas in the Orenda mine at Boswell during the previous week emphasized the need for first-aid work at every mine. Of the 19 killed in that explosion, three were members of first-aid teams in Boswell. All the members of the team who were not injured rendered most commendable aid to the wounded and won unstinted praise from the physicians and hospital attendants.

Through the last winter several teams met faithfully for first-aid training. Five of them competed in a local contest on the Fourth of July. During the two months preceding the meet, W. J. German, C. O. Roberts and Jesse Hensen, of the United States Bureau of Mines, gave much time to the training of the teams, and for two weeks the mine-rescue motor truck toured the field, arousing much interest in first aid.

MINING INSTITUTE MEETING IN MORNING

On the morning of the contest 28 teams, each containing six men, reported. They represented nine companies from 23 mining towns. At 10 a.m., prior to the contest, a mining institute was held, and a crowded house listened to an address by Austin King, chief inspector of the H. C. Frick Coke Co., and H. D. Mason, Jr., assistant engineer of the United States Bureau of Mines. Three thousand feet of moving-picture film was shown, illustrating safety, first-aid and improved methods of mining.

After noon the teams paraded to the ball grounds, accompanied by two bands. There were 2,500 interested spectators. The 28 teams, comprising in all 168 men, were in line. A space of 10 ft. was given to each team, position being assigned by lot. At the sound of the gong the patient advanced to his place, and at the second signal those who were to administer first aid followed him and proceeded to work.

The first event was for one man only. The problem was: Victim has four fingers severely crushed; bleeding wound in the hand. Treat and carry by shoulder lift. T. R. Downie, of the Consolidation Coal Co.'s plant at Acosta, made a perfect score.

The two-man event was: A simple fracture of the right forearm and a scalp wound on the back of the head, but no bleeding. Treat and carry the patient 30 ft. without using a litter. The contest resulted in five teams making the same score, and so the following problem was submitted to them: Patient found unconscious, lying with his abdomen across an electric wire and with a simple fracture of the right forearm. Rescue and treat the case, providing artificial respiration for two minutes.

But still three teams tied for first place, and the following problem was submitted: A victim is burned by steam on face, neck, ears and both hands. Treat and carry the patient 20 ft. without a stretcher. As a result the Jenner-Quemahoning Coal Co.'s team No. 2, of Jerome, Penn., obtained first place, and the Orenda No. 1 team, of the Merchants Coal Co., was second. Third place fell to Jenner-Quemahoning No. 1, also of Jerome, Penn.

The full-team events consisted in alleviating the condition of the following victims: 1. A man has been run over by a motor and his right arm has been cut off close to the shoulder, causing profuse bleeding and breaking several ribs on his right side. Treat and carry on a stretcher. 2. A man is found unconscious and lying on his back across a live electric wire. Rescue him and give him artificial respiration for one minute. Then treat the burns on the back and right upper arm. Carry 30 ft. on any improvised stretcher except one made of poles and coats. 3. A man has a broken back, with a simple fracture of the right forearm. Prepare for transportation.

The averages of the scores made in these three events showed four teams with 99.3 each. The teams broke the tie by working on the following problem: A man is found under a fall of coal, having sustained a punctured wound of the abdomen, a broken rib on the left side and a cut on the right side of the face from which the blood is coming in spurts. Treat the case, three men carrying the patient 20 ft. in a passage so narrow that a stretcher cannot be used. As a result Orenda team No. 3, of Boswell, received 100; Brothers Valley Coal Co. team, Pen Mar No. 3, of Macdonaldton, had 98; the Consolidation Coal Co. team, of Acosta, 97; and the Somerset Mining Co., team, of Hooversville, 95.

BOTH LAY AND MEDICAL MEN AS JUDGES

The events were hotly contested, and the judges marked closely. On all ties there were three judges to each team. The judges were: Drs. E. H. Lowe, L. M. Gurley, of Johnstown; J. W. Hawes, of Windber; C. C. Custer, of Johnstown; C. B. Korns, of Sipesville; H. Hertzler, of Jenners, and S. J. H. Lowther, of Somerset. Other judges were H. D. Mason, Jr., D. Harrington and C. O. Roberts, United States Bureau of Mines, of Pittsburgh; O. J. Shank, of Windber; George A. Deike, Mine Safety Appliance Co., of Pittsburgh, and Edmund Williams, of the Cambria Steel Co., of Johnstown.

The judges were selected by the representative of the American Red Cross in Somerset County, Dr. M. A. MacIntyre, of Boswell. The judging of first-aid meets by other than medical or surgical practitioners is condemned by the officials of the American Red Cross, and the introduction of expert first-aid men to assist the doctors has been made a subject of protest.

The Du Pont cup for winners in the team events was won by Orenda team No. 3, Frank Swope, captain; Aaron Seasock, George Patton, Herbert Horner, Charles Hurd and Fred Moore, patient. The Boswell First-Aid Association added $10 for the purchase of personal prizes. The American Mine Safety Association and the American Red Cross awarded medals to the winners.

The Brothers Valley team, Pen Mar No. 3, of Macdonaldton, consisting of Robert Forsythe, captain, Robert Purcell, Sam Verchetti, William Albright, Harry De Haven and Lawrence Purcell, received second prize—a Bauer & Black first-aid cabinet and Red Cross certificates.

The third prize was awarded to the Consolidation Coal Co. team of Acosta, which comprised S. F. Shafer, captain, T. R. Downie, Robert Grove, William Crosby, R. B. Zimmerman and John Byron, Jr.

The average records of the various teams in the three full-team events which preceded the contest were as follows:

Somerset Mining Co., of Hooversville, 99.3; Consolidation Coal Co., of Acosta, 99.3; Merchants Coal Co. No. 3, of Boswell, 99.3; Brothers Valley Coal Co. No. 3, of Macdonaldton, 99.3; Consolidation Coal Co. No. 1, of Jenners, 99; Victor Coal Mining Co., of Holsopple, 98.3; Merchants Coal Co. No. 2, of Boswell, 98.3; Jenner-Quemahoning Coal Co. No. 2, of Jerome, 97.6; Knickerbocker Smokeless Coal Co., of Hooversville, 97.6; Brothers Valley Coal Co. No. 2, of Macdonaldton, 97.3; Merchants Coal Co. No. 4, of Boswell, 97.3; Merchants Coal Co. No. 5, of Boswell, 97.3; Consolidation Coal Co. No. 2, of Meyersdale, 97; Quemahoning Coal Co. No. 4, of Ralphton, 96.3; Consolidation Coal Co. No. 2, of Jenners, 96; Merchants Coal Co. No. 1, of Boswell, 96; Brothers Valley Coal Co. No. 1, of Macdonaldton, 96; Jenner-Quemahoning Coal Co. No. 1, of Jerome, 96; Consolidation Coal Co., shaft 123, of Gray, 95.6; Quemahoning Coal Co. No. 1, of Ralphton, 95; Consolidation Coal Co., of Pine Hill, 94.6; Consolidation Coal Co., of Wilson Creek, 94.6; Consolidation Coal Co. No. 1, of Meyersdale, 94.3; Baker Whiteley Coal Co., of Hooversville, 94; Quemahoning Coal Co. No. 5, of Ralphton, 93.6; Quemahoning Coal Co. No.

2, of Husband, 93; Quemahoning Coal Co. No. 3, of Ralphton, 93; Quemahoning Coal Co. No. 1, of Husband, 93.

The committeemen in charge of the meet were F. W. Cunningham, state mine inspector; Samuel Steinbach, Consolidation Coal Co., Somerset; Richard Maize, Jenner-Quemahoning Coal Co., Jerome; John Gibson, Jr., Merchants Coal Co., Boswell, and Ralph Zimmerman, Quemahoning Coal Co., Ralphton.

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First-Aid Teams at Oliver Plant

At the coal mines of the Oliver & Snyder Steel Co., near Uniontown, excellent first-aid work has been accomplished though but little about it has so far been published.

The illustration herewith shows the participants in this work, both male and female. In the first row is Junior team No. 2, comprising from left to right, Joe English, Clyde Perkins, John William Kegg, John O'Brien, captain, Pat English and Charles O'Brien.

In the second row is Junior team No. 1, comprising from left to right Charles Perry, Edward Tishue, Cecil Dixon, captain, Samuel O'Brien and Frank Phillips.

In the third row is the ladies' No. 5 team, consisting of Stella Rafter, Florence Grim, Daisy Patterson, Isabella Dixon, Mrs. Harry Rafter, Mrs. Arthur Grim, Elsie Dixon and Barbara Patterson, captain.

In the fourth row is No. 1 team, consisting of Fred S. Watts, captain, Charles Grim, Jr., Charles Carnes, J. R. Craft, Claude Lowdermilk and James English. Farther to the right is No. 2 team, consisting of William Henry, Arthur Grim, Charles Gillingham, John Anthony, David Davis, Ernest Sauers and William Davis, captain.

In the fifth row is No. 3 team, consisting of Don McPhail, captain, Frank Yarnosky, Andy Stiner, William Lally, Evan Cramer and Wilbur Griffith. Still farther to the right is No. 4 team, with Thomas Kegg, Lewis Reiver, James B. Hines, John Petrovish, James Hill and Henry Roebuck, captain.

In the back row is Yard Foreman George Dixon, Engineer Charles Hinsey, Manager Ira D. McCowan, Dr. George O. Evans, Instructor Clyde Brehm, Superintendent John H. Lane, Mine Foreman John Curry, Mine Foreman Gomer Lewis, Superintendent of Car Service J. B. Frost and Mine Foreman Holly Wilson.

The mines of the company are located at Oliver, Fayette County, Penn., on the Pennsylvania R.R. and the Baltimore & Ohio R.R. The seam mined is the Pittsburgh bed, which has a treacherous roof, making first-aid work most necessary.

FIRST-AID TEAMS OF THE OLIVER AND SNYDER STEEL CO. AT OLIVER 1, 2 AND 3 AT UNIONTOWN, PENN.

Permissible Explosives Tests

At the invitation of Van. H. Manning, acting director of the United States Bureau of Mines, a number of the prominent manufacturers of permissible explosives used in coal mines met in conference at the Bureau of Mines offices in Washington, June 7, to discuss the tolerances that may be permitted in tests of field samples or manufacturers' samples of permissible explosives.

At the request of Mr. Manning, Dr. Charles E. Munroe, consulting explosives chemist of the Bureau of Mines, presided at the conference and explained its objects. Addressing the manufacturers, he said:

"Today there are 133 different explosives on the permissible list. There have been others admitted to the list and later removed. In all, over 150 explosives have been tested by the various methods and the results carefully recorded by the bureau. It was found that the bureau could not rest content with simply testing the original samples submitted and saying that hereafter that was a permissible explosive provided it was used in the manner described by the bureau. It was felt that in order that the bureau might know that the explosives were of the proper kind, samples should be obtained in the field and that such samples should be tested by the same methods. When this was undertaken, the question came up as to how nearly the tests should conform to the results of the tests made on the original samples because it is well known that it is physically impossible for a man to exactly duplicate results in two tests.

"After a large amount of data had been gathered, a committee was appointed by the director to consider the problem. The committee has been working on the matter for a long time; the data have been tabulated and closely investigated by the members of the committee."

The questions submitted by the committee of the bureau were taken up in detail, and the proposition to which the conference assented was as follows:

In order to define more exactly what is meant by the phrase "similar in all respects" in the definition of a permissible explosive—namely: "An explosive is called a permissible explosive when it is similar in all respects to the sample that passed certain tests by the United States Bureau of Mines and when it is used in accordance with the conditions prescribed by this bureau"—the following tolerances are recommended for field samples or manufacturers' samples of explosives, beyond which such lot of explosives may not vary.

CHEMICAL ANALYSIS

Moisture to be fixed by a sliding scale of from 1½ per cent. at zero to 4 per cent. at 10 per cent. of moisture in original sample, this tolerance being on total percentage of moisture in the explosive.

For other ingredients (or their equivalents) in quantities not exceeding 60 per cent., special rules shall apply. For ingredients in quantities of 60 per cent. or more the tolerance shall be plus or minus 3 per cent., provided that the ingredients of a permissible explosive shall be considered to be those substances reported as found by the Bureau of Mines in the original sample of that explosive submitted for test as to its permissibility, and provided further that an equivalent shall be considered to be a substance which would not materially alter the properties of the explosive and which would produce the same result as the original substance.

As to the products of combustion (determined by Bichel gage test), the volume of poisonous gases from 680 grams of the explosive including its wrapper must be less than 158 liters, except that in case the first test yields 158 liters or more of poisonous gases per 680 grams of the explosive, including its wrapper, the average result of three tests agreeing within 5 per cent. of each other shall be taken, and no explosive shall remain permissible when this average for poisonous gases exceeds the above standard limit.

PHYSICAL TESTS

The rate of detonation (the average of three trials with Mettegang's recorder) must be plus or minus 15 per cent.

The unit deflective charge (the average of three trials with the ballistic pendulum) must be plus or minus 10 per cent.

The grams of wrapper per 100 grams of explosive must be plus or minus 2.0 grams (average of four determinations), provided that the manufacturers shall submit samples of all different sized cartridges, to be considered as part of the original sample, the amount of wrapper to be determined for each size of sample, and provided further that the tolerances as suggested shall be made in comparison with the various diameters as submitted with the original sample.

The apparent specific gravity of cartridge, by sand, must be plus or minus 7.5 per cent. (average of four determinations), provided that actual density shall be determined on cartridges of the same diameter as the standard and provided further that manufacturers shall be required to submit samples of all sizes.

As to gas and dust gallery No. 1, no ignition must be obtained in each of one or more trials. In the retesting of permissible explosives by tests 1, 3 and 4, the charges of the explosives fired will be reduced 10 per cent. in weight from the weights originally used in order to eliminate any likelihood of a failure being due to the natural variations in the conditions of the gallery.

In the pendulum friction test, each explosive must pass a test of ten trials under the same conditions as originally imposed, except that the fall of the wood-fiber shoe will be reduced by 10 per cent. in order to eliminate any likelihood of a failure being due to the natural variations in test conditions.

HOUSES IN THE VILLAGE AT THE FREDERICK MINE OF THE COLORADO FUEL AND IRON CO.

Discussion by Readers

Mine Discipline Imperative

Letter No. 1—I was greatly pleased to see the long editorial entitled "Is Our Conception of Mine Discipline Changing?" *Coal Age,* Oct. 2, p. 552. I believe this is one of the most vital questions connected with coal mining, and its discussion in *Coal Age* will reach more mining men than would be possible by any other means.

In the large majority of cases the underlying cause of mine accidents is found to be someone's disobedience of instructions or violation of the mine laws or regulations. The fault may lie with the superintendent, foreman, assistant foreman, fireboss, miner, driver, trip-runner or even a trapper boy. In the public press the blame is largely laid on the shoulders of the company or some of its officials.

The editorial to which I have referred regrets the decline of the old-time discipline in coal mining, and it is true that the discipline of today is not what it was a few years ago. It is difficult to give the real reason for this decline, as there are probably numerous contributing causes. I will mention some of these in the hope that others will be led to do the same. By this means we may be able to discover the chief causes and apply the proper remedy.

Responsibility of the Miners' Union

There is hardly a question that the organization of miners known as the "union" is very largely responsible for the lack of mine discipline observed today. This may be chiefly owing to the fact that the union does not concern itself with anything but the number of hours a man works in the mine and the wages he receives. Its constant effort is to decrease the one and increase the other of these items. The public generally considers a labor union as a fine thing, and the press tells great stories of what the union has done for the miner. If the public could visit the mines, however, and observe the manner in which work is performed by men who belong to the union, as compared with that done by nonunion men, their opinions would be quickly changed as a result of their observations.

Comparison of Union and Nonunion Mines

The following comparison of conditions existing in the mines of eastern and western Kentucky will be of interest in this connection:

While in charge of a mine in the mountains of eastern Kentucky, I had representatives of almost every nation on the globe, from the Alabama negro, who had never seen the inside of a coal mine, to first-class miners from England, Germany and France. In dealing with these men, however, I had only to place a chalk mark on the roof where a prop was needed, and the timber would be set promptly. When a miner did not understand, I would point to the chalk mark on the roof and then to the prop lying at the side of the road, and he would at once set the post before finishing the loading of his car. This mine was a nonunion mine, and as foreman I had the authority to enforce discipline by discharging anyone who violated the rules or went contrary to my instructions. The men so discharged would seldom find their way back into the mine.

Compare these conditions with those I am about to describe as observed in a mine in western Kentucky of which I had charge. The men working in this mine belonged to the union, and I foolishly thought that my worry in regard to violations of rules and regulations would now cease, as such violations could be quickly referred to the committee who comprised the business end of so great an organization. I believed this would be an effective means of stopping men from violating the rules of the mine and endangering their own and the lives of others; but, alas, I was greatly disappointed.

A Violation of the Mine Law

A few days after taking charge of the mine, I found a miner filling a cartridge with powder while his lamp was on his head. When I forbade him to do it again, he told me that it was none of my affair whether he filled his cartridge with his lamp on his head or otherwise. I replied by stating that I would send him outside at once if I found him doing the same thing again. The next day I watched and, finding that he repeated the act, I forbade him to load another car and told him to go at once to the office for his time, at the same time giving the driver orders to pull the man's coal to the bottom.

The same night the mine committee waited on me, asking that I go with them to the superintendent, which I did. The superintendent, however, flatly refused to reinstate the man, with the result that the committee reported the case to the union. The claim was made that I had no right to discharge the man, as there was nothing in the union contract giving me that authority. It was stated that the company would not have been to blame if the man had been killed. In order to avoid further trouble, the man was permitted to go back to work and the company was obliged to give him three days' pay.

A Terrible Sequel to Disobedience

The sequel to this incident is of even greater interest than the act itself, as it shows plainly the danger to a miner of disregarding mine laws and regulations made for his safety. The man worked only 32 days longer, when he was discharged by a power that he could not oppose through his union or by any other means. He was carried from the mine on a stretcher, after having received first-aid treatment that was unavailing.

While waiting for the coroner to select a jury, I could not but reflect and ask myself, as he lay there wrapped in blankets, Who is responsible for this man's death—the company, the mine committee, the district officials or myself? The court decided that the company was not responsible, since the assistant foreman testified that he had told the man not to fill his cartridge with his lamp on his head. After reading the article in *Coal Age,* I asked myself, Would it not pay every man to obey the instructions given him by the officials in charge of the mine, whether or not these are a part of the contract?

OTHER REASONS FOR LACK OF DISCIPLINE

Another reason why there is not greater discipline in the mines today is the fact that many mine officials hesitate to prosecute a man for disobedience of orders or for minor violations of the rules and regulations in force. Oftentimes the law is not sufficiently explicit and clear on the point in question or it does not specify the means to be used in prosecuting violations of the law.

Another reason is the lack of education of miners, who mostly consider that their time is worth more to them when digging coal than when setting props. Many miners think that they know more about the place where they work every day than the boss who visits it occasionally, but scarcely one out of a hundred miners sounds the roof before proceeding to work. It may be said that 50 per cent. or more of the miners cannot read or write and another 25 per cent. never look at the mine rules, while a large portion of the remainder fail to obey after they have read the rules, preferring to run the chance of prosecution for any violation of the same.

Many mine officials are themselves to blame for lack of discipline in the mines, because they consider that they have complied with the law when they have posted a copy of the mine rules and regulations. They are like the general manager quoted in the *Coal Age* article as stating that his superintendents had something else to do than to watch the men and see that they obeyed the rules that were posted.

The use of liquor may be rightly given as another cause for lack of discipline in mines. When a man goes to work still under the influence of the liquor he drank the night before, he is in no condition to obey the rules or follow the instructions given him by the foreman, especially if these call for extra exertion or labor on his part. These are some of the reasons why more attention is not given to maintaining a strict mine discipline, and yet there is no greater factor in the prevention of accidents than this. Let us hear from others. O. B.

Cleaton, Ky.

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Efficient Mine Foremen

Letter No. 9—The discussion on "Efficient Mine Foremen" is peculiarly interesting, many of the views and opinions being expressed by mine foremen themselves, than whom, it must be admitted, none are better qualified to speak. These men have been "through the mill," and gained an intimate, human and material knowledge of what constitutes an efficient foreman. This is true in my own case, since I have experienced the ups and downs—principally the downs—of a mine foreman's fortunes in three different states. The number of men in my charge has varied from a mere handful to 700 or 800 employed in the mine.

WHAT CONSTITUTES A GOOD MINE FOREMAN

My experience confirms the definition I heard given by an old mine foreman some years ago as to what would constitute a good foreman. This old foreman was George Young, a member of the State Board of Examiners. The board was composed mostly of practical miners whose aspirations had enabled them to rise from digging coal at the face to official positions in the mine. In company with several others, I was taking the examination for my first certificate of competency. Sitting in the hotel lobby, after the first day's grind, this gray-haired old friend of years ago, replying to a question asked by one of the boys, set a standard that still appeals to me as a fairly accurate definition of what constitutes a good mine foreman.

He said, "My lad, the mine boss of the future, if he fulfills all that will be expected of him, besides being a practical miner, will be an athlete, diplomat, somewhat of a mining engineer and have a pretty good understanding of mechanics, chemistry and geology." While we boys took this answer as a joke, I know now that the old man was more in earnest than we thought. With the experience of the past, George Young was able to look farther into the future and knew better than we what would be required of coming mine officials. With him I can say earnestly, If ever there was a job that called for the exercise of every faculty, physical and mental, that job is the mine foreman's today.

HIGH STANDARD OF REQUIREMENTS

During the past 30 years Pennsylvania has required an increasingly higher standard of efficiency in the examination of candidates for certificates of competency to act as mine foremen and firebosses. Aside from his personal experience as a miner, the candidate must now show a certain proficiency in mathematics and a knowledge of steam and mechanical engineering, embracing the application of electricity in mining operations. Indeed, the subject last named is considered of the greatest importance, judging from the revised bituminous mining laws (1911).

To quote a recent contributor to *Coal Age,* an efficient mine foreman must possess some knowledge of human anatomy and be able to give first-aid treatment and engage in rescue work as occasion may require. His knowledge of geology and the formation of coal must be such as to enable him to develop the mine in an intelligent manner, especially if he is in charge of a small mine for the development of which he is responsible. As this contributor says, "These are but a few of the things a mine foreman must know."

SMALL SALARIES PAID MINE FOREMEN

The same contributor concludes with the remark, which he overheard made by a mine operator, to the effect that he "would be glad to pay a foreman possessing such knowledge and qualifications a salary of $2,000 a year." In regard to this last statement, I know personally many practical, well-informed mine foremen capable of managing a mine as economically and safely as conditions will permit who receive little more than half the sum mentioned. Close observation and acquaintance with all classes of salaried men, not mining men alone, only deepen the wonder that such men, possessed of a practical knowledge of mining and having attained a certain degree of technical efficiency by the use of midnight oil or otherwise, should be compelled to accept the small remuneration offered for their services.

No doubt the chaotic condition of the mining industry, with its cut-throat competition, which frequently compels the operator to sell coal at or near the cost of its production, accounts for the meagerness of the salaries paid the men who have charge of the mines and who shoulder the heaviest responsibilities in their relation to the company, the men and the commonwealth One thing I do know is that for every superintendent, to say nothing of mine foremen, who receives $2,000 a year I can point out a dozen who receive less than that amount. If anyone doubts this statement, I would suggest that he insert in *Coal Age* a small advertisement calling for an efficient mine foreman possessed of such knowledge and qualifications as mentioned and stating that he will be paid the salary named. The result, I venture to predict, would be a flood of applications from as well-qualified foremen as there are in the United States or any other country.

AN IMPOSSIBLE TASK OFTEN EXPECTED

While admitting that many mine foremen fall short of the standard of efficiency that they might attain, it is equally true that many coal companies expect too much of their foremen, who in many instances are compelled to produce results with no resources at hand that will enable them to do this, even though possessed of a store of knowledge and experience. In many cases the natural conditions or the equipment of the mine makes the production of cheap coal an impossibility. The best foreman living cannot rehabilitate an old mine and produce results at once, though he is often expected to accomplish a miracle. Some mines, like some lives, require time to overcome a long period of dissipation and misuse.

Perhaps there was some humor in the remark of Thomas Hogarth, *Coal Age,* Oct. 9, page 601, stating that "the trouble with most mine foremen is that they spend too much time in one place." I can hardly repress a smile as audible as the voice with which a mine mule calls for his dinner when I think of it. On coming out of the mine a few days ago in company with a sturdy Briton, I drew his attention to this statement of Mr. Hogarth's. Turning fiercely about, he exclaimed, as he wiped the heavy drops of sweat from his face and forehead: "What's he mean be that? Does he mean we sit around too much?" And turning in the direction of his well-earned supper and repose, he added, "A man's more apt to be runnin' his bloomin' legs off than to be sitting around."

Perhaps Mr. Hogarth refers to days long since gone by when miners practically all spoke English and were of average intelligence with the foreman himself. The mine being small and the coal hauled by mules, there was little or nothing to go wrong, and the foreman could sit for an hour or two at the side of the track or in the fireboss' shanty and enjoy a rest. But in these days, when the law requires the foreman or his assistants to visit every working place at least once a day, there is not much danger of his wearing a smooth place on the bench at the side of the track.

A MINE FOREMAN'S ACTIVITIES

As an illustration of the activities of the average mine foreman, I would cite my usual experience when visiting a mine. At the office I am told by the superintendent, "You'll find John inside somewhere." Inquiry of the motorman brings the response, "Why, the boss went up the mains a bit ago." Proceeding up the main entries, I find a driver who says, "I seen him headin' up the third-left." Following the trail through all the rooms on the third-left and then through a crosscut down the fourth-left, a trapper-boy there offers the information that "No. 23 room on fifth-left cut through last night into an idle room off the fourth. Probably the boss went through there to the fifth-left."

Giving up the chase of this foreman on his marathon, I determined to wait his reappearance. Musing on this incident, I conclude that there are many "Johns," in many mines in many states, who do too little sitting down. Most of the foremen I have known, and feel honored to know, are overzealous in their employer's interests, which are more on their minds than the thought of the small salary they are paid. I would say that their error, if such it can be called, lies in attempting to do more than one man can accomplish.

In conclusion I would state that the qualifications that mark an efficient mine foreman are much the same as those that indicate efficiency in other lines of endeavor. The man must know his work and do it, regardless of intimidation from any source. In few vocations do the lives of men depend so much on one man's actions as in mining. The mine foreman must be sober and coolheaded, a leader of men and a firm disciplinarian. He must be sure he is right, firm in his convictions and a student of human nature as well as the principles of mining. Without these elements he cannot hope for success. But to understand and handle men he must understand and be able to handle himself. SIM. C. REYNOLDS.

Houston, Penn.

Letter No. 10—The letter of Wm. Crooks, *Coal Age,* Sept. 4, page 394, in which he told of the great improvements made in a mine by a new foreman, recalls a similar incident in my own experience.

The foreman of a certain mine on giving up his place was asked to recommend a man for the position. To the surprise of all, he recommended a new man who had never been in the mine and was unacquainted with the conditions. This, however, was not the worst feature of the change, as will soon appear.

THE FOREMAN AND HIS ASSISTANT

The assistant foreman in this mine had held his position for ten years, and the miners naturally expected that he would be promoted and made foreman when that official resigned—not that they expected to derive any advantage themselves from his appointment, but they thought he had earned the right to the place by his work for so many years. When the new foreman took charge, the assistant foreman was retained and continued to perform his duties as before. But as time went on, more work was left for him to perform, and he practically ran the mine, assuming the most of the responsibilities. The new man was a drinker and was almost sure to get on a "toot" every Sunday.

CONDITIONS IN THE MINE GREW WORSE

The assistant carried out the orders of the foreman to the letter, doing many things contrary to his own judgment, and as a result conditions in the mine grew rapidly worse. The ventilation was poor, the air at the working face being so bad that the men could not work full time, owing to headache and other ailments.

Things went on this way for a time. When the committee complained to the foreman, he smoothed matters over very nicely, and they were loath to take the matter up with the superintendent. The mine was an old mine, there being two or more miles of abandoned entries having no tracks, where roof falls were hard to clean owing to the distance the dirt must be handled. The air became so bad on the main haulage roads that drivers could not hold their lights, and the oil lamps at the shaft bottom refused to burn. I was running a motor at the time, and in places where the roof was bad on the road I was afraid to ride the machine under the bad top. I would send the rider ahead and, starting the machine slowly, permit it to run alone until it had passed the bad place and was stopped by the rider. I would then walk by the place myself and in this way escape injury. In some places water stood over the roads.

The Assistant Appointed Foreman

The foreman gave little attention to affairs in the mine, but became interested in an elevator that was situated in the next town. In about a year he purchased a half-interest in the elevator and signified his desire to quit the mine, recommending his assistant for the place. Although the assistant had done practically all the work and had taken the full responsibility, the superintendent hesitated some time, but finally decided to give him a chance and appointed him as mine foreman. It was a hard proposition, but the man now appointed knew what was needed in the mine and started at once to improve its condition. In a short time he made a remarkable showing. The ventilation was greatly improved, the roads well drained, although he found this could be accomplished with the use of four pumps instead of seven as before, by draining the water into the same basin, by small ditches that cost practically nothing.

Before giving up his place, the previous foreman had ordered a car of iron rails. This arrived after the assistant had been promoted to the position of foreman. Not needing the iron, he had the rails neatly piled in a good place outside the mine, where they remained untouched for a year. He did not permit a single track tie to be sent into the mine, but instead made use of the old ties of abandoned tracks that had been thrown aside. He increased the output to 1,100 tons a day, without incurring any additional expense.

I cite this as an instance showing that the superintendent was not a good judge of men. He either did not know or did not care what his foreman was doing in the mine, but relied wholly on his judgment. I hope that this discussion will open the eyes of many superintendents and cause them to come into closer touch with their foreman and know his qualifications, as well as those of his assistants, any one of whom may be required to take the foreman's place at a future day.

Cleaton, Ky. OSTEL BULLOCK.

Study Course in Coal Mining

By J. T. Beard

The Coal Age Pocket Book

CUBIC MEASURE

1728 cubic inches = 1 cubic foot
27 cubic feet = 1 cubic yard
16 cubic feet = 1 cord foot
8 cord feet = 1 cord.................128 cubic feet

A **cord of wood** is a pile 8 ft. long, 4 ft. wide and 4 ft. high, and contains 8 × 4 × 4 = 128 cu.ft.

A **cord foot** is one foot of the length of the pile that makes a cord, and contains 1 × 4 × 4 = 16 cu.ft.

A ton of **round timber** (green) is taken as 50 cu.ft.

A ton of **squared timber** (green) is 40 cu.ft., it being assumed that hewed or squared timber has lost one-fifth of its original volume in squaring.

A long ton (2,240 lb.) of **anthracite** or a short ton (2,000 lb.) of bituminous coal broken (mine-run) occupies about 40 cu.ft.

There are two measures of capacity, known as "Liquid" and "Dry" measures, having like denominations but of different values. The old English wine gallon (231 cu.in.) was replaced in England, in 1824, by the imperial gallon (277.274 cu.in.), but is still the standard "Winchester" gallon in the United States. The "Dry" gallon, now practically obsolete, contained 268.8 cu.in.

LIQUID MEASURE (U. S.)

4 gills = 1 pint.................28.875 cubic inches
2 pints = 1 quart.................57.75 cubic inches
4 quarts = 1 gallon.................231 cubic inches
31½ gallons = 1 barrel.................4.21 cubic feet
2 barrels = 1 hogshead.................63 gallons
2 hogsheads = 1 pipe.................126 gallons
2 pipes = 1 tun.................8 barrels

DRY MEASURE (U. S.)

2 pints = 1 quart.................67.2 cubic inches
8 quarts = 1 peck.................537.6 cubic inches
4 pecks = 1 bushel.................2150.4 cubic inches
36 bushels = 1 chaldron.................44.8 cubic feet
Or, 4 quarts = 1 gallon.................268.8 cubic inches
8 gallons = 1 bushel.................2150.4 cubic inches

The standard bushel, in the United States, is the old Winchester bushel, which is a circular measure 18½ in. in diameter and 8 in. deep, contaning 8 (0.7854 × 18.5^2) = 2150.4 cu in. This was replaced in England, in 1826, by the imperial bushel (2218.192 cu.in.), which was then made the legal bushel.

LIQUID AND DRY MEASURE (GREAT BRITAIN)

4 gills = 1 pint.................34.659 cubic inches
2 pints = 1 quart.................69.318 cubic inches
4 quarts = 1 gallon.................277.274 cubic inches
2 gallons = 1 peck.................554.548 cubic inches
4 pecks = 1 bushel.................2218.192 cubic inches

The Coal Age Pocket Book

There is no separate standard for liquid and dry measures in Great Britain, both being referred to the same unit or standard, which is the imperial gallon (277.274 cu.in.).

MEASURE OF TIME

60 seconds = 1 minute
60 minutes = 1 hour
24 hours = 1 day
7 days = 1 week
365 days = 1 common year
366 days = 1 leap year
12 calendar months = 1 calendar year
100 years = 1 century

Commonly speaking, **a day** is marked by one complete revolution of the earth on its axis, and **a year** by one revolution of the earth in its orbit about the sun. Unfortunately, however, the earth does not make an even number of turns on its axis, while making one complete revolution in its orbit. There are approximately 365¼ revolutions on the axis to a single revolution in the orbit.

In order to compensate for this eccentricity and make the calendar year conform as closely as possible to the solar year, so as to preserve uniformity in the return of the seasons, it was necessary to add one day to the calendar every fourth year, except the closing year of the century. Thus, the **common year** of 365 days was supplemented by a **leap year** containing 366 days.

The "Gregorian" calendar, established by Pope Gregory XIII (1582) and generally adopted in Great Britain and elsewhere (1752), replaced the "Julian" calendar and, in dropping 10 days by making Oct. 5, Oct. 15, 1582, restored the equinoxes to their proper date. To obtain closer correspondence of the calendar and solar years, the closing year of each century, 1600, 1700, etc., was made a common year, although these would be leap years in the regular course.

The Day—A day is the interval of time marked by two successive transits of a heavenly body across a given meridian, caused by the revolution of the earth on its axis.

The **solar day** (24 hr., 0 min.) is the time interval marked by two successive transits of the sun across the meridian.

The **sidereal day** (23 hr., 56 min.) is the time interval marked by two successive transits of a fixed star across a given meridian.

The Month—The calendar year has been arbitrarily divided into 12 months, in correspondence to the "number of moons" or the revolutions of the moon about the earth in a solar year. But, since 365 days are not equally divisible by 12, it was necessary to make an unequal division, as follows:

January	31 days	May	31 days	September	30 days
February	28 days	June	30 days	October	31 days
March	31 days	July	31 days	November	30 days
April	30 days	August	31 days	December	31 days

The extra day required in a leap year is added to the month of February, making 29 days in that month every leap year, instead of 28 as in the common year.

Inquiries of General Interest

Miners' Compensation Act

Referring to the discussion in *Coal Age* relating to the compensation of miners as provided by the recent act of the Pennsylvania Legislature and the effect on the constitutional rights of the miner as an individual, I would like to submit a question to the readers of *Coal Age* asking them for their opinion in regard to the effect of this act on the miner who avails himself of the option of rejecting its provision, preferring to hold himself free for the exercise of his constitutional right to apply for redress to the district courts, in case of accident or injury in the performance of his regular duties in the mine.

To illustrate the point I have in mind, permit me to anticipate both the time and ratification of this act and to infer that it has become operative as it now reads. Then, assuming that the operator or employer avails himself of the option of accepting or rejecting the provisions of the act, he has simply to notify his employees to that effect, in writing, and to file the same notice with the State Bureau of Workmen's Compensation of the Department of Labor and Industry, within ten days after such service and before any accident has occurred in the mine.

I do not mean to infer that an employee is legally compelled to follow the example of his employer in accepting the provisions of the act. If he desires to maintain his constitutional rights, he has the option of rejecting the provisions of this act and seeking employment elsewhere. But by the reading of the act (sec. 302), the failure on the part of an employee to reject the act implies its acceptance, and the law construes it as such an acceptance.

The question I would like to ask is this: Does not this proviso of the act give the employer the power of dictating to those whose conditions and circumstances compel them to comply with his choice of the conditions under which they must serve while in his employ? In other words, does it not give the employer the power to dictate to his employees the conditions under which all operations in his mine shall be conducted, irrespective of the constitutional amendment? I would characterize this as a legal "duress," because it empowers the employer to compel an employee's compliance with certain demands, however unwilling the latter may be because of the exigencies of his condition, which leave him no alternative but to obey the dictates of his employer. As I understand it, the new act sanctions such compulsory compliance. If I am wrong, I shall be glad to be set right in this matter. A. M. INER.

——, Penn.

Correspondent has raised an interesting question, although in our opinion he has overestimated the meaning of the act. Sec. 302 of Art. 3 of this act reads as follows:

> In every contract of hiring made after Dec. 31, 1915, and in every contract of hiring renewed or extended by mutual consent, expressed or implied, after said date, it shall be conclusively presumed that the parties have accepted the provisions of Art. 3 of this act and have agreed to be bound thereby, unless there be, at the time of the making, renewal or extension of such contract, an express statement in writing from either party to the other, that the provisions of Art. 3 of this act are not intended to apply, and, unless a true copy of such written statement, accompanied by proof of service thereof upon the other party, setting forth under oath or affirmation the time, place and manner of such service, be filed with the bureau within 10 days after such service and before any accident has occurred.
>
> Every contract of hiring, oral, written or implied from circumstances, now in operation, or made or implied on or before Dec. 31, 1915, shall be conclusively presumed to continue subject to the provisions of Art. 3 hereof, unless either party shall on or before said date, in writing, have notified the other party to such contract that the provisions of Art. 3 hereof are not intended to apply, and unless there shall be filed with the bureau a true copy of such notice, together with proof of service, within the time and in the manner hereinabove prescribed: Provided, however, that the provisions of this section shall not be so construed as to impair the obligation of any contract now in force.

In our understanding of the act as it reads, either party to a contract of employment has the option of accepting or rejecting the provisions of Art. 3 of the act, notice of such acceptance or rejection being given in writing to the other party and likewise filed with the bureau, as stated in the act. Or the acceptance or rejection of the act, on the part of an employee, may be implied if he continues to serve his employer after having received due notification in writing of the latter's acceptance or rejection of the provisions of the act, provided the said employee fails to notify his employer, in writing, of his own acceptance or rejection of the same act.

That is to say, if an employee makes no response to the written notice of his employer his silence is an implied agreement to accept or reject the provisions of the act, in common with the choice indicated in the notice he has received. On the other hand, if an employee chooses to pursue a different course from that of his employer he must notify the latter, in writing, of his election in respect to the act, and file a copy of such notice with the State Compensation Bureau, in accordance with the requirements of the act, within ten days of the time of serving the original notice.

The law should not be interpreted in the sense of a compulsory act, as suggested by correspondent. On the contrary, the intention of the act is quite the reverse, providing, as it does, the option of accepting or rejecting its provisions, as either party to the contract may elect. For, assuming an employer accepts the provisions of the act, any employee who so desires can reject its provisions by giving due notice in writing to his employer and filing the same with the bureau. He can then continue to serve his employer, although having rejected the provisions of the act. In that case, however, he is not entitled to recovery for injury, except through due process of law as before the act was in force.

Coal Age will be glad to have its readers discuss this aspect of the law further. An interesting question would be, In case an employer rejects the provisions of the act, could one of his employees, by accepting the said provisions of the act, recover from the employer in case of accident?

Examination Questions

Recent Iowa Examinations for Hoisting Engineers

(*Selected Questions*)

Ques.—How can you tell when the valve of an engine has lead, without opening the chest, if there is no punch mark to go by?

Ans.—An indicator card taken from the cylinder of the engine will show, by its point of compression and compression curve, how much lead the valve has been given. Without reference to the indicator card, however, the simplest method of determining this question is to rotate the engine to a point just short of dead-center. Then, having opened the drip-cock, at the end of the cylinder occupied by the piston, "crack" the throttle. That is to say, open the throttle just a crack to admit steam sufficient to blow through the cylinder and escape by the drip-cock, without moving the engine. If steam escapes at the drip-cock in this position, before the piston has reached the end of its stroke, it indicates that the valve has a certain lead. To determine approximately how much lead there is to the valve, rotate the engine backward from this point and observe when steam ceases to escape at the drip-cock. In this answer, we assume that there is no leakage of the valve, which would of course interfere with the test.

Ques.—If the length of the stroke of an engine is 2.5 ft. and the piston speed 900 ft. per min., what is the number of revolutions?

Ans.—The question intends to ask how many revolutions does the engine make in a minute. The number of strokes per minute is found by dividing the piston speed (feet per minute) by the length of stroke in feet; thus, $900 \div 2.5 = 360$ strokes per min. Since an engine makes two strokes to every revolution, the number of revolutions per minute is $360 \div 2 = 180$ r.p.m.

Ques.—Which will stand the greatest inside lap, a condensing or a noncondensing engine?

Ans.—Inside lap to a valve means an earlier closing of the exhaust port, when compression begins in that end of the cylinder. A condensing engine will stand a greater inside lap than a noncondensing engine, because of its greater range of pressure, which extends from below the atmospheric line to the full cylinder pressure. An earlier point of compression on the indicator card of a condensing engine will show a less percentage of loss in the indicated power of the engine than would be the case in a condensing engine under the same conditions.

Ques.—If you were in charge of a boiler and the glass water gage should be broken, what would you do?

Ans.—Close the lower cock of the gage and then the upper. For this purpose, there should be kept in the engine room an iron rod of suitable length and provided with a shank that will permit these cocks to be turned without the person being scalded by the escaping steam. If the upper cock were to be closed first, a spray of scalding water would be thrown from the lower cock. To avoid this, the lower cock must always be closed first. The engineer should keep on hand a supply of gage glasses, and insert a new glass at once in place of the one broken.

Ques.—What is an eccentric?

Ans.—An eccentric is a circular disk having a grooved circumference in which is fitted a ring that is made fast by a suitable connection to the end of the eccentric rod. The eccentric is mounted on the crankshaft, the center of the disk being at a distance from the center of the shaft equal to half the throw of the valve. The eccentric serves the same purpose as a crank to throw the valve backward and forward at each revolution of the shaft, the eccentric disk revolving within the ring that encircles its circumference.

Ques.—What are the results of the forming of scale in a boiler, and how would you prevent the formation of scale?

Ans.—The formation of scale in a boiler reduces its efficiency. The scale prevents the free transmission of the heat of the furnace to the water within the boiler and decreases the generation of steam per pound of fuel burned. Scale is also a menace to the safe operation of the boiler. Boiler plates covered with scale are apt to become overheated, and it frequently happens that the cracking of the scale allows the water to come suddenly into contact with the red-hot iron, when an explosion is almost sure to follow.

The best means of preventing the formation of scale in a boiler is to use as pure water as possible. All feed water contains more or less sediment, which is liable to accumulate from time to time in the boiler. To avoid this the boiler should be partly blown off at frequent intervals, the frequency depending on the amount of sediment in the water. Where this sediment accumulates as mud in the bottom of the boiler or in the mud drum, the boiler should be completely blown off at regular intervals, say at least once a week, and the accumulated sediment removed from the boiler by scrapers.

Where the water contains salts, such as carbonates or sulphates of lime and magnesia, these are precipitated by the boiling of the water. The precipitated salts form a hard crustation or scale that adheres firmly to the boiler plates and tubes. Sulphate of soda is frequently used in waters containing a small quantity of salts of the alkaline earths; it reduces these to a soluble sulphate of soda and carbonate of lime and magnesia. The former is carried in solution in the water, while the latter falls as a light sediment that does not scale and is readily blown out of the boiler.

Feed-water heaters assist the purification of the water entering the boiler. It has been found of advantage to add a small amount of petroleum or coal oil to the feed water. The oil has the effect of coagulating the sediment and preventing to a considerable degree the formation of scale. All feed water containing impurities should be subjected to analysis to determine its best treatment.

Coal and Coke News

Washington D. C.

Van H. Manning, chief of the Bureau of Mines in an interview given out here, takes the view that the bureau is serving an unknown and valuable end in preparing a corps of men who would be at once available for war hospital srevice, should such a need arise.

"In 48 hours," he says, "50,000 trained first-aid-to the injured experts could be mobilized in the great mining states of the country. I mean the trained mine rescue crews. Since 1908 the Bureau of Mines has done extensive demonstration and training work among men in the mining companies throughout the country. Every mine of importance now has its corps of trained rescue workers. These men are thoroughly expert in all sorts of bandaging, treatment of minor fractures, sterilization of wounds and probing for foreign objects in the body.

In addition they are trained to use the oxygen helmet which will permit them to enter places where the air is too poisonous to be breathed. In all mining states there is an annual mobilization of these potential hospital workers. Competitive drills are performed by the crews. This keeps the men in perfect training, accustoms them to working together, and insures the certainty of quick mobilization in time of war.

Another important feature of a hospital service and one for which we are directly responsible is base railroad cars containing the necessary supplies and bunks for the first aid corps. We have eight such cars—a good nucleus for a complete service in wartime—and with scarcely any change in apparatus they would be ready to carry the crews as near a battle front as need be."

Report on Corporation Legislation

The Federal Trade Commission has issued a report prepared by the Bureau of Corporations regarding state laws relating to corporations organized under the laws of other states. It collects the laws of all states regarding the conditions under which such corporations may do business, etc. A companion report just issued details the main points in the laws of the Southern and Southwestern states for the taxation of corporations. Both reports are of considerable interest.

HARRISBURG, PENN.

About a year ago a medical inspection in the anthracite region showed that in one of the Nanticoke schools a large percentage of the children were tubercular or were subject to tuberculosis. This report was taken up by Dr. S. D. Dixon, commissioner of health of the state, through his bureau of housing of which John Moliter, a Philadelphia architect is the head. From time to time Moliter visited this section and by his own plan his reports, particularly his recommendations, have been translated for the foreign papers having a large circulation in the Nanticoke region.

First there was an investigation of the housing conditions, showing that the tubercular condition of the children, and other signs of poor health were easily traceable to the great insanitation and disorder that prevailed. Subsequent visits followed up the recommendations that were made. Officials of the operating coal company, coöperated with Mr. Moliter, who now reports to the state commissioner, with much satisfaction that the district is on its way to great improvement.

As a result of this spirit of coöperation maintained by the head of one of the largest coal companies, additional residence sites have been opened up and sold cheaply on easy terms to the employees and at present 17 houses are under construction, besides a large Lithuanian church. These will help to relieve the overcrowding among the foreigners, one of the chief faults. It is also planned to open other blocks for building purposes as soon as the working people are in a position to proceed with the financial end of the undertaking.

The district has also improved by the cleaning up of dumping grounds, repairing of underground drains and the removal of surface drains and the cleaning up of cattle and hog pens. Several suspicious wells and sources of water supply have also been abandoned according to instructions.

Through the State Health Department's interest Mr. Moliter first started his work in the Nanticoke district in March of this year and has followed it up with the gradual process of education, recommendations, urging and threats of litigation, which have combined to bring about this promising result.

PENNSYLVANIA

Anthracite

Pottsville—Judge Brumm on Oct. 21 adjourned court at noon, and with a dozen state mine inspectors and engineers visited the Kehley Run Colliery, where it is alleged the removal of pillars will sink millions of dollars worth of real estate.

Hazleton—It is stated that in a colliery of the G. B. Markle Co. at Jeddo recently a miner, William Meehan, found a perfectly formed petrified snake. This is held as evidence by some people as upsetting the theory that coal was formed when only vegetable life existed on the earth.

The Lehigh Valley Coal Co. has announced that it expects soon to commence extensive stripping operations in this vicinity and at Buck Mountain and Oneida. It is expected in this way that large quantities of anthracite will be taken out by this labor-saving method, while at the same time employment will be given to many men.

Scranton—Supt. Weber, of the Board of Education, has reported that 25 students had enrolled in the night school to study mining. The instructor is Frank Gleason, a graduate of State College and a practical mining man. The text-book used is by Joseph J. Walsh, of Wilkes-Barre, mining inspector in the Ninth District.

Mahanoy City—The Buck Mountain and Vulcan collieries of the Lehigh Valley Coal Co. were recently compelled to suspend operations on account of a scarcity of cars. Most of the other operations throughout the immediate vicinity, however, have been enabled to work full time for some weeks past.

Catawissa—The series of freshets and absence of low water on the river throughout the summer have made the season a favorable one for coal dredges. The quantity of coal removed from the river since spring exceeds the product during any other year on record. The comparatively high water has enabled the dredges to move wherever they pleased. The field of operation of these machines has been accordingly much enlarged.

Swoyersville.—Frank H. Hemelwright, general manager of the Temple Coal & Iron Co., has announced that his firm will recompense the owners of property on Slocum street, Swoyersville, damaged by a mine cave caused by quicksand running into the workings. Two houses of Thomas Quigley were engulfed to the second story and irreparably damaged. Two neighboring houses owned by John Hayden were also damaged. Mr. Hemelwright stated that the hole through which the quicksand ran into the workings was small.

Pittston—It is understood by local officials of the Lehigh Valley Coal Co. that this firm has decided to purchase automobiles for the use of many of its division officials within the next six months. The division superintendents already have cars purchased by the company. Electricians, efficiency men and engineers will likely come under the new order.

Another of the spasmodic subsidences on Upper William street has endangered the tracks of the Moosic line of the Scranton Railway Co. and has caused the company to transfer passengers at the Erie crossing. The disturbed surface overlies the workings of the Pennsylvania Coal Co. There has been caving in this neighborhood for over a year.

Wyoming—Three hundred employees of the Mt. Lookout Coal Co. recently attended the fourth annual banquet of the Mt. Lookout First Aid Corps here. James H. Evans, of Forty Fort, was toastmaster, and the speakers were local clergymen and mining officials.

Bituminous

Harrison—The Quemahoning Creek Coal Co. with large operations in Somerset County has purchased some new machinery to be installed at its plant here. A new tipple is being erected and equipped with a new picking table, which will enable the company to increase its output.

Allenvale—Two hundred mine workers employed by the Valley Smokeless Coal Co. walked out for the second time recently. The trouble was over the scales used for check-weighing. The miners at the first strike demanded a checkweighman at the tipple and a pit committee. This was allowed by the company. As soon as the checkweighman got on the job he advised the miners he thought the scales were short weight. This resulted in a second strike. At a conference between the officials of the company and the men it was decided to get the State Sealer of Weights and Measures to test the scales which were found correct. Not being satisfied with the test the miners decided to run a few cars of coal from the mine and have them weighed. To this the company agreed, and as the scales were again found to be correct the miners returned to work.

Connellsville—The production of coke in the Connellsville region recently amounted to 421,000 tons, with shipments amounting to 422,000 tons. These are decided increases over previous weeks, and ovens are being fired as fast as the labor to operate them can be secured.

Kittanning—It is reported that the Kittanning Iron & Steel Co.'s plant will start in full about Dec. 15, giving employment to 800 men. The Furnace Run Coal Co. near this town has announced that it needs 500 men immediately.

WEST VIRGINIA

Charleston—According to Earl Henry, chief of the state department of mines, the labor shortage in the mining fields, especially in the northern part of West Virginia, is growing acute, and unless more men are found within a short time many interests besides the mines will be affected. Mr. Henry states that insufficient labor makes it impossible at present for many mines to be operated to a point where orders can be filled.

The United States Coal & Coke Co., operating in McDowell County, has withdrawn its suit against State Compensation Commissioner Lee Ott asking a mandamus to compel him to release the company as a subscriber to the compensation fund. The company dismissed the suit, it announced, to avoid creating the impression that it was seeking to escape the payment of its obligations or to destroy the state compensation fund, although the suit was brought because the company believes it has the right to carry its own compensation insurance.

The old mine of the Stillman Coal Co. on the West Virginia side of the Ohio River will be put in operation within a few weeks, after a suspension of several months. This mine was recently leased by the coal company, and the leasee is said to be in possession of orders for its product. Twenty men are now engaged in cleaning out the mine and when this work is completed a force of 100 miners will be employed.

Moundsville—The Mound mine recently resumed operations and will continue for some time. Only one side of the mine, however, will be operated and no shipments will be made, the output being for local trade only.

Bluefield—The Norfolk & Western R. R. during the month of September handled 2,910,221 tons of coal, compared with 3,005,618 tons during August. Every month since last June has marked an increase in the amount of tonnage handled with the exception of September, which fell short of August shipments. It is believed that September would have shown another high record had it not been for five days of congestion at Lambert Point, which curtailed the output of the mines considerably. In any case, however, the tonnage of the road has increased 1,871,007 tons in four months time. It is believed, also, that the total shipments to the end of October will be equal to all the coal shipped during the year 1914.

ALABAMA

Birmingham—An explosion occurred recently at the Banner mine at a time when no one was in the workings. The cause of the explosion is unknown. It was thought for a time that fire had been set to the timbers and mine, but later investigations proved this not to be the case. Damage due to the explosion appeared to be confined to a small portion of the mine workings.

KENTUCKY

Louisville—Local shippers, coal operators and commercial organizations as well as railroad authorities have received appeals from the Interstate Commerce Commission asking that they do all in their power to expedite the use of cars so as to rob the present car famine of as many of its drawbacks as possible. It is urged that the railroad officials do what they can to prevent congestion of cars at terminal points and that shippers unload them as expeditiously as possible so as not to keep them out of service.

After a "suggest-a-name contest" which the Harlan Coal Co., operating mines in Harlan county, began in August, ran for about two months the company has selected "Black Beauty" as the trade name for the coal it handles. The provisions of the contest were stated to about 4,000 retail dealers in the 16 states in which the company does business. More than 900 names were received in response. Nine dealers suggested the name adopted and the prize, a car of "Black Beauty" lump was awarded to Fisher Brothers, of New Paris, Ind., the first of the nine to offer the suggestion.

Stearns—Mines around here are in regular operation and vacant miner's homes are being rapidly occupied. Construction of a new tipple at Mine No. 4 is under way and additions are being made to the tipple at Yamacraw.

Whitesburg—The Kentucky Block Coal Co., operating near Elkhorn City on the newly completed Carolina, Clinchfield & Ohio R.R., will soon begin its initial shipments to South Atlantic coast points. A mining town is being constructed and the company will have an initial capacity of 2,000 tons daily.

Middlesboro—Handling of the rush coal business in this section was the principal matter considered at the recent meeting here of the Southern Appalachian Coal Operators' Association. Fifty operators were present, including representatives from Cincinnati, Covington, Louisville and Knoxville.

Hazard—The Blue Grass Coal Co. is rapidly getting into readiness to make its first shipments of coal from the new plant immediately below Hazard on the Louisville & Nashville R.R. The company will have a daily capacity of 1,000 tons, which will be increased from time to time.

OHIO

Bellaire—What is said to be a record for the output of coal from one mine in Ohio was recently established at the No. 1 mine of the Rail & River Co., when 2,631 tons were mined and sent out. The output for three consecutive days was 7,500 tons. About 450 men are employed in this mine.

Columbus—The Modern Coal Mining Co., has started loading coal at the stripping operation at Parlette, Jefferson County. The initial capacity is 300 tons daily which will gradually be increased to 800 tons.

INDIANA

Princeton—After three-weeks idleness the 350 men of the Princeton mine who have been on strike have returned to work and several hundred more have resumed in the Terre Haute field. Points at issue, involving discharge of two men, will be left to the International Board of the United Mine Workers, work being resumed pending adjudication of the contentions. The mines here and at Terre Haute are owned by the Deep Vein Coal Co., of Terre Haute.

Sullivan—After a shut down of three weeks, the Chicago-Carlisle Coal Co.'s mine has been reopened for work, pending a settlement of a difficulty resulting from the removal of a curtain from one of the mine entries, thus allowing bad air to get into the rooms.

Vincennes—Option has been taken on 3,000 acres of land between this city and Lawrence, Ill., in the interests of a large coal company. The owners are to receive $25 an acre. In drilling for oil in this field seams of coal of varying thicknesses have been found at depths of 300 to 700 ft.

ILLINOIS

New Baden—The statement that the New Baden mine of the Southern Coal, Coke & Mining Co. is to be closed and customers supplied from the Little Oak and Shiloh mines near Belleville, is said to be incorrect. The company has so many orders for New Baden coal that it is said the mine will be operated regularly and indefinitely. The Little Oak and Shiloh operations are also working regularly.

O'Fallon—Copper wire to the value of $300 was stolen recently from the Taylor Coal Co., which operates the St. Ellen and Ridge mines. The wire was used for power transmission between the mines. Tracks showed that the thieves came in a wagon the first night and took part of the wire and returned the next night in an automobile and finished the job.

Carterville—W. E. Trautmann, of East St. Louis, receiver for the Carterville Coal Co., on Oct. 20 sold the Burr C mine and holdings here at auction. It was bid in by the Mississippi Valley Trust Co., of St. Louis for $43,000 to protect its mortgage for $38,000 and accumulated court costs. This leaves an unpaid indebtedness of about $40,000, of which $20,000 is wages due employees. The mine has been closed down since last March. Frederick Vierling, trust officer of the Mississippi Valley Trust Co., announces that no plans have been made for resuming operations. The mine employs 300 men when working.

MISSOURI

Columbia—A 3-ft. bed of coal was discovered at a depth of 20 ft. recently by workmen digging footings for the basement walls of a moving picture theatre. Although large portions of Boone County are underlaid with coal measures at varying depths, this is the first time that coal has been found inside the corporate limits of Columbia. This coal will not be developed.

IOWA

Des Moines—The new Iowa Industrial hospital will be opened within 60 days. Remodeling has been inaugurated and an entire expenditure of $100,000 will be made. The institution is to be operated especially for the convenience of coal miners and is to be equipped with special facilities to care for accident cases.

COLORADO

Greeley—It has been stated that the American Coal Tar Products Co. has been experimenting with coals from the mines about Erie and Frederick and that it contemplates erecting a factory to manufacture analines and other coal-tar products therefrom.

WYOMING

Kemmerer—The mine of the Roberts Coal Co. near town was destroyed by an explosion recently and up to the present time there is no clew as to whom the guilty parties may be. The mine had been closed Saturday after the day's work, and the door to the mouth of the tunnel locked. Underneath the door was a small hole in which tools were kept, and from here an axe was taken with which the door was evidently broken in. The rope attached to the mine car was cut and the car run to the back of the mine. There was a quantity of powder and fuse there which was exploded, completely wrecking the inner part of the property.

PERSONALS

Carl Scholz, president of the Rock Island Coal Mining Co., left Chicago Oct. 18 for Oklahoma to spend a short time at the company's mines.

M. Marks, field representative of the Hirsch Electric Lamp Co. of Philadelphia, is in the Pittsburgh district supervising some new installations of his company's equipment.

H. J. W. Reed, assistant inspector of mines of Kentucky, is out on his regular inspection of the mines in his territory, which includes Breadhitt, Laurel, Lee, McCreary, Morgan, Perry and Rockcastle counties.

J. M. Roan, of Athens, Ohio, mine inspector, assisted by several deputies and the mine rescue car opened Poston Mine No. 6 of the Poston Consolidated Coal Co. recently. The mine had been sealed for six weeks because of a fire. Upon opening the mine and entering the entries with helmets it was found that the fire was extinguished and but little damage had been done. The mine will be placed in operation soon.

OBITUARY

George Kroeger, of Chicago, in Boonville, Ind., for the past year optioning coal lands in that vicinity, recently died suddenly of heart disease. A daughter living in Chicago survives him.

Horace G. Williams, a mining engineer of prominence, died recently in Philadelphia after an illness covering two years. Mr. Williams was 55 years of age, having been born in Minersville, Penn. After being employed in his professional capacity in that vicinity for a number of years, he became interested in the coal and lumber business in the South. He was at one time president of the Street Railway Co., of Portsmouth, Va., and also acted as receiver for the Beaver Creek Railroad & Lumber Co.

TRADE CATALOGS

Lea-Courtney Co., Newark, N. J. Catalog H-2. "Centrifugal Pumps." Illustrated, 64 pp., 6x9 in.

Coppus Engineering & Equipment Co., Worcester, Mass. Catalog. "Coppus Turbo Blower." Illustrated, 40 pp., 6x9 in.

The Cutler-Hamer Mfg. Co., Milwaukee, Wis. Loose Leaf Catalog. "Electric Controlling Devices." Illustrated, 4½x7½ in.

Templeton, Kenly & Co., Ltd., 1020 S. Central Ave., Chicago, Ill. Bulletin Catalog No. 115. "Simplex Jacks." Illustrated, 24 pp., 6x9 in.

Chicago Pneumatic Tool Co., Fisher Building, Chicago, Ill. Bulletin No. 130. "Lubrication of Pneumatic Tools." Illustrated, 4 pp., 6x9 in.

The Electric Storage Battery Co., Philadelphia, Penn. Handbook H L. "Low Voltage Isolated Electric Light and Power Plants with the Chloride Accumulator." Illustrated, 52 pp, 6x9 in.

PUBLICATIONS RECEIVED

"The Second Annual Report of the State Inspector of Coal Mines for Colorado." Unillustrated, 82 pp., 6x9 in.

"Annual Report of the Inspector of Mines for Ohio, 1913." Unillustrated, cloth bound volume of 486 pp., 6½x9¾ in.

Department of the Interior, U. S. Geological Survey. "The Production of Asbestos in 1914." By J. S. Diller. Illustrated, 9 pp., 6x9 in.

Department of the Interior, U. S. Geological Survey. "The Production of Graphite in 1914,' by Edson S. Bastin. Unillustrated, 15 pp., 6x9 in.

Department of the Interior, U. S. Geological Survey. "The Production of Mineral Paints, in 1914." By James M. Hill. Unillustrated, 19 pp., 6x9 in.

Department of the Interior, U. S. Geological Survey. "The Production of Talc and Soapstone in 1914," by J. S. Diller, Unillustrated, 6 pp., 6x9 in.

Department of the Interior, U. S. Geological Survey. "Sulphur, Pyrite and Sulphuric Acid in 1914." By W. C. Phalen. Unillustrated, 18 pp., 6x9 in.

Department of the Interior, U. S. Geological Survey. "Gold, Silver, and Copper in Alaska in 1914," by Alfred H. Brooks. Unillustrated, 10 pp., 6x9 in.

Department of the Interior, Bureau of Mines, Bulletin 72. "Occurrence of Explosive Gases in Coal Mines." By M. H. Darton. Illustrated, 248 pp., 6x9 in.

Canada Geological Survey, Department of Mines. Memoir 59. "Coal Fields and Coal Resources of Canada." By D. V. Dowling, illustrated, 174 pp., 6½x9¾ in.

Department of the Interior, U. S. Geological Survey. Bulletin 621A. "Field Apparatus for Determining Ash in Coal," by S. E. Lesher. Illustrated, 12 pp., 6x9 in.

Department of the Interior, U. S. Geoligical Survey. "Gold Silver, Copper, Lead and Zinc in the United States in 1914," by J. P. Dunlop. Unillustrated, 24 pp., 6x9 in.

Department of the Interior, U. S. Geological Survey. "The Production of Manganese and Manganiferous Ores in 1914," by D. F. Hewett. Unillustrated, 16 pp., 6x9 in.

Department of the Interior, U. S. Geological Survey. "The Production of Salt, Bromine and Calcium Chloride in 1914," by W. C. Phalen. Unillustrated, 15 pp., 6x9 in.

Department of the Interior, U. S. Geological Survey. "The Production of Fluorspar in 1914, with a note on Cryolite." By Ernest F. Burchard. Unillustrated, 6 pp., 6x9 in.

Industrial Commission of Ohio. Department of Investigation and Statistics, Report No. 3. "Statistics of Mines and Quarries in Ohio in 1913." Unillustrated, 93 pp., 6½x9¼ in.

Department of the Interior, U. S. Geological Survey. "Copper, Silver, Lead and Zinc in the Central States in 1914." By B. S. Butler and J. C. Dunlop. Unillustrated, 100 pp., 6x9 in.

Department of the Interior, Bureau of Mines, Technical Paper 84. "Methods of Preventing and Limiting Explosions in Coal Mines." By George S. Rice and L. M. Jones. Illustrated, 45 pp. 6x9 in.

Department of the Interior, Bureau of Mines. "United States Mining Statutes, Annotated," by J. W. Thompson. Bulletin 94, Part 2, Miscellaneous Mining Subjects. Unillustrated, 910 pp., 6x9 in.

Department of the Interior, U. S. Geological Survey. Water Supply Paper 375F. "Conditions Requiring the Use of Automatic Gages in Obtaining Records of Stream Flow," by C. H. Pierce. Illustrated, 8 pp., 6x9 in.

University of Illinois, Engineering Experiment Station, Bulletin No. 79. "The Coking of Coal at Low Temperatures, With Special Reference to the Properties and Composition of the Product," by S. W. Parr and H. L. Olin. Illustrated 39 pp., 6x9 in.

INDUSTRIAL NEWS

Toronto, Ont.—The Brule Lake Coal Co., Ltd., has been incorporated by the Mackenzie & Mann interests, with head office in Toronto, Ont., and an authorized capital of $200,000.

Little Rock, Ark.—The Thomas Adams Fuel Co., of Little Rock, Ark., has been incorporated with a capital stock of $10,000. The incorporators are T. W., T. O., V. C. and F. E. Adams.

Philadelphia, Penn.—The launching has just taken place of the "Virginia," a coal carrying ship built for the Pocohontas Coal Co. The vessel has a capacity of 7,000 tons exclusive of bunker coal.

New Orleans, La.—Collier No. 1, property of the Monongahela River Consolidated Coal & Coke Co., which was sunk at this port in the hurricane of Sept. 29, at a loss of $75,000, will be raised. Divers are now at work.

Clarksburg, W. Va.—The Balkan Coal Co. was recently organized with a capital stock of $50,000. The incorporators are J. E. Long, C. B. Johnston, B. H. Monroe, Fred Radford and M. Stuart, of Clarksburg, W. Va.

Guthrie, Okla.—The Milton Coal Mining Co. has been incorporated with a capital stock of $14,000. The incorporators are Henry E. Johnson, of Perry; J. E. Woodworth, R. J. Conneway and E. S. Lowther, of Guthrie.

Pittsburgh, Penn.—The mining territory formerly covered by the Philadelphia office of the Lidgerwood Mfg. Co. will, after Nov. 1, be handled by W. J. Johnson, sales manager of the Pittsburgh office of the same company.

Charleroi, Penn.—Plans have been drawn for the erection of 400 new coke ovens at the Allicia works of the W. Harry Brown Co. These plans will shortly be put into effect and work on the new ovens is expected to commence within a month.

Welch, W. Va.—The Fire Creek Coal Co. has been organized with a capital of $250,000 and chief works in Raleigh County, West Virginia. The incorporators are Willam Leckie, A. E. Jennings, J. H. Jennings, A. F. Leckie and W. B. Beale, all of Welch, W. Va.

Bellaire, Ohio—The property of the Johnson Coal Co., consisting of a leasehold mine and the machinery and equipment thereof, together with a number of tenement houses, will be sold at public auction by C. W. Dickens, trustee, for cash on Nov. 19.

Welch, W. Va.—The Douglas Coal Co. has been organized with a capital of $150,000 and with principal works in the Dry Fork district of Raleigh County. The incorporators are William Leckie, A. F. Leckie, W. B. Beale, J. H. Williams, A. E. Jennings, all of Welch, W. Va.

Buffalo, N. Y.—Work on the reconstruction of the water coal dock of the Delaware, Lackawanna & Western R.R. Co. has begun, so that the end of the long dispute appears to be in sight. The new dock will replace the old one, being a trifle north of it, as directed by the Secretary of War.

New Orleans, La.—The Cahaba Red Ash Coal Company, of this city, is offering as a stimulation to winter trade a patent coal scuttle, free to every purchaser of a small quantity of Cahaba or lump coal. The company reports that it has distributed hundreds of the scuttles since the advent of cool weather two weeks ago.

.**Henderson, Ky.**—Judgment for $2,000 as damages has been awarded the Keystone Mining Co., of this city against the Louisville & Nashville R.R. in the circuit court. The plaintiff sought damages of $50,000 alleging that the defendant company refused to switch coal loaded at the plaintiff's mine to local manufacturing plants.

Lexington, Ky.—The Kentucky Coal Lands Co., of New York has won its suit in the Federal Court against the General Development Co., of Pennsylvania, which involved the 8-mi. boundary line of an extensive mineral and timber tract in Letcher county. Many thousand dollars worth of land was involved in the case which was on trial for two weeks.

Louisville, Ky.—Coal tonnage on the Louisville Division of the Illinois Central R.R. running into the western Kentucky field, for the month of September was the greatest in the history of the road. The haulage for that month was 298,545 tons of commercial coal. The nearest approach to this record was in October, 1914, when 267,760 tons were hauled.

Pittsburgh, Penn.—The Stauffer Chemical Co., through the Pittsburgh Industrial Development Commission, has taken title to 110 acres of land near Monongahela, Penn., and has 100 additional adjoining acres under option. An option has also been taken on coal land for the purpose of assuring the company of its own fuel supply. These coal lands are in Carroll Township, Washington County.

Columbus, Ohio—Monsarrat Bros., coal operator, with offices in the Hartman Building, Columbus, is planning extensive improvements at its mines, located at Hemlock, Ohio. The property is located on the Zanesville & Western R.R. and now produces 400 tons daily. The output of the property will be enlarged in the near future. The partnership is composed of Nicholas D. Monsarrat and C. R. Monsarrat.

Denver, Colo.—Complaint has been filed with the state public utilities commission charging the Colorado Midland, Midland Terminal and the Cripple Creek & Colorado Springs railways with unreasonable and unjust freight rates on coal shipped to the Cripple Creek district from the mines of the Grand Junction Mining & Fuel Co. and the Palisade Coal & Supply Co. The same companies filed similar complaints a short time ago against the Denver & Rio Grande Ry.

Ashland, Ky.—The Ashland Iron & Mining Co. will shortly start its No. 2 Furnace, closed since December, 1914, and also 72 coke ovens, idle about the same length of time. The furnace will employ 150 men, while 50 to 60 more will find work at the coke ovens. The coal mines of this company are running almost to capacity with a good demand for the product. A new operation was recently opened, shipments from which are just beginning to come in.

Whitesburg, Ky.—Coal operators throughout the Eastern Kentucky territory, including the main Elkhorn and Boone's Fork fields of Letcher County, report an increase of at least 30% since Oct. 1. Railroads, it is reported, have added a number of extra trains and are still pushed to handle the big increase. Thousands of miners are now employed in the mines throughout the eastern Kentucky field. Better prices prevail and operators are optimistic upon conditions.

Grafton, W. Va.—James A. Sincell has been awarded the contract for extensive improvements to be made by the Boat Run Coal Co. These improvements consist of the construction of a half-mile of electric haulage road and the building of two tipples, as well as making two openings and placing the timber in readiness to start work. This work is to be done on a 1,500-acre tract under lease to the company. It is expected that work will be started within two weeks.

Columbus, Ohio—Eastern Ohio coal operators recently asked the Public Utilities Commission to investigate rates of four railroads operating in the eastern portion of the state and to enter an order reducing the rates to a point where they will not be unreasonable and unjustly discriminatory. The petitioners are the Pittsburgh Vein Coal Operators' Association, and the railroads against which complaint is made are the Baltimore & Ohio, Pennsylvania, Wheeling & Lake Erie, and the New York Central.

Harrisburg, Penn.—The Department of Mines has just issued a statement covering the consumption of coal by trade local to the mines in the anthracite region for the period from 1903 to 1913. This statement shows that the increase in consumption has been entirely disproportionate to the increase in population. In 1903 the consumption was 1,373,167 tons, while in 1913 it was 1,943,238 tons. The increase has been gradual, although occasionally the amount would fall behind the previous year on account of a mild winter.

Chicago, Ill.—The property of the Dering Coal Co. of Delaware, situated in Vermillion County, Indiana, and in Fayette Township, Vigo County, Indiana, which was sold last May on foreclosure to Henry Russell Platt of Chicago, has been purchased by the J. K. Dering Coal Co. These properties include the old No. 6 mine near Durkee's Ferry, the old Willow Grove property just west of Clinton, 320 acres about a mile south of Durkee's Ferry and some other isolated tracts. Work will begin at once to sink a shaft at the old No. 6 mine to the 4th seam and the company expects to be taking out coal within 60 days.

Hazard, Ky.—A population of 10,000 is regarded as a probability for this city by next year because of the opening up on an extended scale of the mining field hereabouts. This will represent a growth in two or three years from a town of 300 or 400 people. At this time new plants are being opened up at Buffalo Creek, Glowmaur, Lothair, First Creek and Lennut, while the Louisville & Nashville is finishing work on a branch line into Buffalo Creek and First Creek. About half of the 500 cars of coal which the Louisville & Nashville is delivering daily into Winchester, Ky., comes from the Hazard field. This is soon to be largely increased as the railroad increases its capacity.

Coal Trade Reviews

General Review

Anthracite orders slowing down, but market still firm. Strong upward tendency in bituminous continues. Exports show moderate increase. Lake trade expanding with approaching close of navigation.

Anthracite—A touch of warmer weather has caused a slowing up in orders which has given the retailers a welcome opportunity to catch up on business. The market has not lost ground, but neither has it seen any important additional expansion during the week. Mines are on full-time basis, or as full as the inadequate car and labor supply will permit, and stocks at Tidewater are well cleaned up. Concessions on the circular are still occasionally noted, though prices are generally well maintained, and are notably stiffer than a few weeks ago. The irregular arrivals at the distributing centers are causing considerable confusion. There are still some conservative members of the trade who maintain that there are strong possibilities of a poor winter's business, due to rigid economy among the poorer domestic consumers.

Bituminous—The strong upward tendency continues. The paucity in both the labor and car supply, which is becoming steadily more acute, is the dominating feature of the market. It is noted that some of the steel interests, controlling their own fuel supply, are coming into the market for extra surplus tonnages. Requisitions on contracts are generally at the maximum, and some shippers are beginning to fall behind on their obligations. Prices are up from previous quotations. However, it is clear that competition is still keen for what spot business develops, though a little additional buying power would put the market in a strong position.

Exports.—A moderate increase in export shipments is noted, in spite of the heavy handicap of inadequate vessel tonnage. The pinch of the poor car supply has not been so keenly perceptible on foreign business, the roads giving preference to export tonnages in order to avoid vessel demurrage. Vessel rates have advanced even above the previous prohibitive levels, and tonnage is even more scarce than before with steamers difficult to obtain. Frequent inquiries are received from abroad, but the agencies are beginning to lose interest, feeling that it is scarcely worth while to bid so long as the vessel situation remains so unsatisfactory. Circular prices are nominally maintained at Tidewater, but good orders for prompt movement would no doubt shake out some concessions.

Lake Markets—The steady improvement continues, though conservative observers are inclined to regard the situation as abnormal in view of the fact that it is built up primarily on large war orders. However, it is undoubtedly a fact that there is a persistent expansion in manufacturing that is causing a steady increase in the coal consumption. The Lake trade is rather more active, and indications point to a rush of fair proportions over the closing period in spite of the growing scarcity of vessel tonnage. The return of milder weather conditions has caused a slowing up in domestic business which is falling somewhat behind expectations, but constructive factors predominate in the market generally, and colder weather gives indications of rush orders in the very near future. Prices on all grades are stronger, operators already well covered having advanced quotations sharply.

Middle West—The appearance of a period of relatively warm weather has brought some pressure on the domestic market, though the demand continues well distributed. Full circular prices rule generally, and there is no consignment coal on the market. Surpluses are well cleaned up, while the railroads continue absorbing a good tonnage and the market has not lost ground by any means. The higher temperatures have not seriously affected shipments out from the upper Lake ports; the movement for September showed a gratifying increase over the same month last year, but receipts are falling behind because of attractive offers made vessel owners for grain and iron charters.

A Year Ago—Cold snap starts the retail anthracite trade moving, but the mines continue short of orders. Bituminous outlook pessimistic. Cancellations the rule, and mines are reducing working schedules.

BUSINESS OPINIONS

Iron Age—Despite efforts of the larger steel companies to hold the demand in check, signs of a runaway steel market are increasing. They report orders coming in at such an enormous rate that all of them are being carefully considered before being accepted. On some classes of material it is a question of getting deliveries and not prices. This month will establish new records in the output of iron and steel, but in spite of the huge production the mills are getting farther back in deliveries. The extraordinary demand for open-hearth steel is bringing about conditions which prevailed several years ago under similar conditions.

Bradstreet—Save for a probably temporary setback to retail distribution caused by a spell of warm weather, progress in trade and industry continues of conspicuous proportions, with even greater gains apparently in store. In the larger lines cumulative expansion is the chief characteristic; retail merchants show a stronger propensity to buy ahead; the steel trade goes on making ground; prices on some finished products have been advanced, partly to keep buying within certain bounds; the long predicted scarcity of railway cars is an actual fact and a paucity of labor exists.

Marshall Field & Co.—Current wholesale distribution of dry goods continues to show a healthy gain over the corresponding period of a year ago. Mail orders and road sales are heavy for immediate delivery. Customers continue to be in the market in much larger numbers. Collections are above normal. The advancing prices in many lines of cotton, wool and silk goods reflect the firmness and upward tendency of prices in primary markets.

Boston News Bureau—The best evidence of business improvement is the glutted condition of some of the railroads. Western dispatches say that there are now more loaded freight cars standing still on the side tracks waiting to be moved than at any time in years. Atchison's loadings, for instance, are breaking all records. Without question, however, the feature of supreme moment is the continued demoralization of foreign exchange. Neither the $500,000,000 Anglo-French loan nor the liquidation of American held stocks for English account have been sufficient to hold up sterling exchange. The fact is New York is fast becoming the money center of the world. The flow of capital is in that direction.

Southern Lumberman—Reasons for the further advances in prices obtained for yellow pine lumber are not hard to find. Reports are uniformly to the effect that the demand is rapidly and steadily increasing. Railroads continue to buy, and in larger quantities. Rush orders are being received from retail dealers with such frequency as to cause wholesalers much concern about prompt delivery, and a number of mills in Mississippi-Louisiana territory are reported as turning down orders, particularly for rough stock. Car builders and implement manufacturers are also placing orders, and there is a heavy inquiry from the East. Shipment of 16 mills for the month of September shows that 418,388,705 ft. were produced in September, as against 384,590,700 ft. in August.

Dun—Even the change to milder weather did not materially lessen retail demands, and there are still many more points of gain than of loss in the general situation. This fact is made clear in reports from the principal centers, as well as by the various statistical gauges that measure business movements and volumes. Bank clearings outside of New York largely surpass those of recent years, gross railroad earnings are steadily rising, the upward trend of commodity prices is unchecked and the increase in commercial borrowing gives additional proof of trade expansion. Evidence of widening activity is apparent in nearly every important department and in localities where no sign of it was manifest a short time ago. Progress is more rapid, as it should be, in the industrial than in the trading field, and is most pronounced at cities where the manufacture of war supplies is now the leading occupation.

ATLANTIC SEABOARD

BOSTON

Spot market quiet, but contract demand active on Pocahontas and New River. Prices not as firm as were expected. Low prices on cars are in prospect for 1916. Georges Creek easy, but quality grades from Pennsylvania are active. Anthracite trade favorable.

Bituminous—The Hampton Roads coals are generally firm at $2.80@2.85, but this week has shown there are still some soft spots in the market. Two or three small orders for delivery the next 60 days have been closed on an alongside basis that is understood to net not over $2.75 f.o.b. and probably 5c. less. Spot business is so extremely quiet that all the agencies get into the competition when inquiry is made. Contract demand is good, enough newspaper comment on the possibility of car and labor shortage having reached New England buyers to make them actively interested in getting supplies forward. Export trade is also in good shape for the moment. The whole situation is just at the point where a little buying power would induce a near active market on Pocahontas and New River.

So far, Georges Creek is in sufficient supply to fill current orders, although the shippers are requiring somewhat longer notice than has lately been usual. They were, however, successful competitors for one of the few contracts that has come up during the week, and doubtless spot business is as attractive to them as to the shippers farther south.

Several of the Pennsylvania coals are really enjoying an active market. Some of the Cambrias have advanced 10c. since last reports and in a few cases are declining new business, particularly that which calls for delivery through the winter. Reports of labor shortage from some districts are almost alarming and apparently an increasing number of operators are conservative in their commitments from now on. The Somerset grades seem to be less affected thus far, though that region is usually among the first to feel any scarcity of cars. All the quality coals are now active, more of the consumers being reached all-rail and therefore more sensitive to rumors of slow movement. The last fortnight there has been a lot of doubling up on usual contract requirements and operators in many cases find themselves unable to take advantage of the small premiums that are now being offered for delivery from now to April.

Water Freights are also hardening a little on account of the increased contract demand; 85c. is the current quotation on boats of 2,500 tons upward, Hampton Roads to Boston. Long Island Sound barges are also in better demand, as high as 55c. having been paid lately from New York to New Bedford.

Anthracite trade is good in all directions. The weather has turned colder and retail demand is much improved. At the same time the companies are not discouraging new business and in most cases are very little behind on their orders.

Bituminous quotations, f.o.b. loading ports at points designated, are about as follows per gross ton:

	Philadelphia	New York	Baltimore	F.o.b. Mine
Clearfields	$2.25@2.75	$2.55@3.00	....	$0.95@1.50
Cambrias and Somersets	2.45@2.95	2.70@3.20	....	1.20@1.65
Georges Creek	2.92@3.02	3.22@3.32	$2.85@2.95	1.67@1.77

Pocahontas and New River prices, on cars Boston, are $3.50@3.73; Providence, $3.50@3.68; and f.o.b. loading port at Hampton Roads, $2.80@2.85.

NEW YORK

Anthracite market active. Mines feeling car shortage. Tidewater situation improving. Steam coals stronger. Bituminous demand increasing. Prices advance and car supply bad.

Anthracite—There is considerable activity in the anthracite market. Present conditions are exceedingly healthy and the prospects for a continuation of same are bright. The mines continue to work full time whenever sufficient cars are available but even at that operators are unable to get out sufficient coal to meet requirements owing to labor scarcity. Some independent operators have enough orders on hand to keep them busy for the next month or six weeks. Shipments to the West are restricted owing to lack of box cars while scarcity of the small cars hinder shipments East.

Of the large sizes egg is weaker than stove or chestnut and occasional stray cargoes have sold at $5.20. Stove and nut are strong and there were reports that some shippers had secured premiums for the choice grades for quick delivery.

The steam size situation is becoming stronger. Pea is commanding full companies' circular and sometimes better. The poorer grades of No. 1 buckwheat were quoted during the week at $2.50 but the better coals are bringing the full circular.

Quotations, f.o.b. New York harbor, gross tons, are:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$5.05		$5.10	
Egg	5.30	$5.20@5.30	5.35	$5.25@5.35
Stove	5.30	5.20@5.30	5.35	5.25@5.35
Chestnut	5.55	5.40@5.55	5.60	5.50@5.60
Pea	3.50	3.25@3.50	3.55	3.50@3.55
Buckwheat	2.75	2.25@2.75	2.80	2.25@2.80
Rice	2.25	1.85@2.25	2.30	2.00@2.30
Barley	1.75	1.50@1.75	1.80	1.75@1.80

Bituminous—Demand is on the increase and the Tidewater situation shows much activity. The demand has showed much strength and there has been a corresponding increase in prices. While there has been no evidence of a lack of supply as yet the scarcity of labor and shortage of cars are tending to bring about this condition. Many middle houses have had their representatives in the coal fields during the past week.

Loading docks in the harbor have small stocks and shippers find a ready market. Contract holders are taking their full quota and there is very little of the high-grade coals left for the spot market. Some shippers were greatly worried the early part of the week by the report that certain of the railroads entering New York were about to place an embargo on shipments. It was not expected however that this order would affect coal shipments.

Shortage of bottoms is striking hard at the export business but bunker demand continues heavy.

The cheaper grades of coal at tidewater are about 35c. higher than last week and some sellers are advising quick buying at those figures, as next week may see still higher prices. With the possible exception of George's Creek coals all grades have advanced from five to ten cents per ton.

Current quotations on various grades, f.o.b. New York harbor, gross tons, follow:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.20@3.30	$3.20@3.30	$3.20@3.30	$1.75@1.85
Georges Creek Tyson	2.95@3.00	2.95@3.00	2.95@3.00	1.40@1.45
Clearfield:				
Medium	2.80@2.85	2.80@2.85	....	1.25@1.35
Ordinary	2.75@2.80	2.75@2.80	....	1.20@1.25
Broad Top Mountain				1.25@1.45
Cambria County:				
South Forks	3.05@3.10	....	....	1.50@1.60
Nanty Glo	2.90@3.00	....	....	1.35@1.45
Barnesboro	2.85@2.90	....	....	1.30@1.35
Somerset County:				
Quemahoning	....	2.90@3.00	2.90@3.00	1.35@1.45
Medium	2.80@2.90	2.80@2.90	2.80@2.90	1.25@1.35
Latrobe	2.70@2.75	....	....	1.15@1.20
Greensburg	2.90@3.00	....	....	1.25@1.35
Westmoreland	3.20@3.30	....	....	1.45@1.55
West Virginia Fairmont ¾		2.70@2.80	2.70@2.80	90@1.10
Fairmont mine-run		2.70@2.75	2.70@2.75	.90@1.00
Steam		2.70@2.80	2.70@2.80	1.15@1.25
Western Maryland		2.70@2.80	2.70@2.80	1.15@1.25

PHILADELPHIA

Anthracite slowed up by the weather, but quickly recovered on return of seasonable conditions. Production large. Car supply short. Pea and stove lead the sizes and chestnut slow, but slightly firmer. Bituminous had fair week; slight price increases, especially Fairmont. Exports somewhat better but vessels scarce.

Anthracite—The week started in badly due to a return to summer weather which caused considerable holding up of orders by the retailers. However, retailers have had an opportunity to catch up with orders, many of them having been badly behind in this respect. The latter part of the week again turned cold so that the wholesale trade resumed its former briskness and the week can well be counted as a good one. All signs point to a busy market.

Low prices are the chief source of trouble to the dealers, rather than a lack of business. The cut-rate war rages and this week it extended to the north-west part of the city. Every dealer blames his neighbor and for the present an adjustment appears hopeless. The fight will probably continue until coal becomes scarce and in the meantime many of the householders appear to be taking advantage of the unusual prices and at the same time fortifying themselves against a probable suspension.

Broken is well taken care of while chestnut is still draggy but with quotations moderately firm. Egg shows little improvement and sales were recorded the past week at from thirty to forty cents off circular; one sale of 600 tons was made at $3.35, which is 40c. less than the circular. The individuals do not seem to be able to move it fast enough, even at cut rates, to avoid car demurrage at the mines. Stove and pea continue the leaders. The latter size is especially active and the dealers have moved more of it than any other size. Still the price does not advance, much to the chagrin of the individuals who appear to be most anxious to make up their losses. There is certain to be an adjustment in the price of this size, though not at any time soon.

Buckwheat continues steady, and at times even scarce, while rice cannot find a market. Some of the larger companies are bringing large quantities of rice into the city and storing it at convenient points.

The prevailing prices f.o.b. cars at mines and at Port Richmond, per gross ton are as follows:

	Line	Tide		Line	Tide
Broken	$3.50	$4.75	Pea	$2.50	$3.25
Egg	3.75	5.00	Buckwheat	1.25	2.25
Stove	4.00	5.00	Rice	.85	1.75
Chestnut	4.15	5.25	Barley	.50	1.50

Bituminous—While many agencies report a good tonnage there are some who claim that shipments have been no better than the average, but even the offices of these concerns present a brisk appearance in their efforts to get the orders off the books. This is due to the difficulty in getting cars which is particularly felt in the Fairmont region where prices have been forced up. As a matter of fact the upward tendency in all grades continues to some extent. There has been a little more activity in the export trade; shippers continue to get frequent inquiries for foreign shipment, yet many feel it is a waste of energy to make quotations owing to the lack of vessel tonnage. At the present time most boats usually in the coal trade are carrying grain, oil and war munitions at very high rates.

The following are average prices prevailing, per gross ton:

Georges Creek Big Vein	$1.70@1.80	Fairmont gas, ¾	$1.30@1.45
South Fork Miller Vein	1.55@1.65	Fairmont gas, mine-run	1.15@1.25
Clearfield (ordinary)	1.20@1.30	Fairmont gas, slack	.85@ .90
Somerset (ordinary)	1.15@1.25	Fairmont lump, ordinary	1.10@1.20
West Va. Freeport	1.00@1.10	Fairmont mine-run	.95@1.05
		Fairmont slack	.85@ .90

BALTIMORE

Market grows steadily tighter under the restrictions of a poor labor supply and inadequate car movement. Export trade shows an improvement. Anthracite men busy.

Nearly everybody seems to want coal now that so little is available above that moved on contract obligations. Most of the producers and shippers are considerably behind on contracts.

In most of the mining districts of West Virginia, Pennsylvania and Maryland the past week the railroads were far behind in the car supply. Because of a number of recent vessels reporting here, both the Baltimore & Ohio and Western Maryland were giving some preferential treatment toward getting coal here to save ship demurrage. The result was an increase in the export movement over several weeks past. During the week just closed a total movement of 32,635 tons was recorded for foreign ports.

Anthracite dealers are quite busy. Supplies so far have been sufficient despite car shortage.

The following are prices quoted, although some coals are practically if not entirely out of the market:

	Mines	Balt.*	Fairmont	Mines	Balt.*
Geo. Crk. Big Vein	$1.80	$2.98	Ordinary mine run	$0.90	$2.28
Geo. Crk. Tyson	1.50	2.68	Ordinary ¾	1.00	2.43
Clearfield	1.30	2.48	Ordinary slack	.75@ .80	2.08
South Fork	1.45	2.63	Low sulphur mine-run	1.20	2.63
Latrobe	1.10	2.18	Low sulphur ¾	1.30	2.73
Somerset (best)	1.45	2.63	Low sulphur slack	.85	2.23
Somerset (good)	1.25	2.43			
Quemahoning	1.35	2.53			
Freeport	1.00	2.08			
Miller Vein	1.25	2.33			

* F. o. b., outside Capes.

HAMPTON ROADS

Movement for week somewhat light. Fair surplus at Tidewater.

Dumpings for the week continued light as compared with those of a few weeks back. The demand has been light on all grades both in the wholesale and retail market. The continued warm weather is having its effect on domestic dealers who are reporting but a small percentage of the usual sales for this time of the year.

Regular circular prices are still being quoted on coastwise and export coals while domestic grades are retailing at from $7.50 for anthracite to $5.50 for lump, egg and splints. There is a fair surplus of free coal at Tidewater and while shippers will not quote below the usual circular price an order for prompt movement could probably be filled at somewhat below circular.

Railroad Tonnages—Dumpings over the local piers for the past five weeks compare as follows:

	Week Ending				
Railroad	Sept. 27	Oct. 2	Oct. 9	Oct. 16	Oct. 23
Norfolk & Western	163,400	131,055	140,934	145,236	163,920
Chesapeake & Ohio	91,341	72,996	93,344	66,361	81,517
Virginian	79,176	59,997	65,150	54,964	51,304
Totals	333,917	264,048	299,428	266,561	296,741

Ocean Charters, Clearances and Freights

VESSEL CLEARANCES

The following steamers have cleared from various ports during the week ended Oct. 22:

NORFOLK

Vessel	Destination	Tons
Campania[1]	Genoa	6,250
Fortunata[1]	Porto Ferrajo	3,700
Jupiter[1]	Genoa	6,826
Hesperos[2]	S. American Pt.	6,600
Socotra[2]	Rio de Janeiro	2,773
M. di Giorgio[3]	Kingston	1,400
Wimborne[4]	Gib. for Orders	8,720
Wegadesk[5]	Canal Zone	6,500
Brendon[1]	Dakar	6,000
Ulysses[5]	Canal Zone	12,000
Radcliffe[4]	Gib. for Orders	8,775
Maria C.[1]	Porto Ferrajo	4,380
Angiolina[6]	Italian Port	4,763
Berwindvale[7]	Havana	8,000

NEWPORT NEWS

Vessel	Destination	Tons
Sinaloa[8]	Gardenas	2,500
Europa[2]	Havana	2,392
Fauna[8]	Puerto Cabello	1,565
Vesuvio[8]	Genoa	7,181
Modiva[8]	Puerto Mexico	1,656
Colusa	Tiburon, Cal.	3,369

BALTIMORE

Vessel	Destination	Tons
Maxwell, Jr.	Guiana	849
Plymouth	Egypt	7,035
Tharros	Italy	4,325
Moedegaard	Cuba	4,127
Harflite	Italy	6,500
Grekland	Sweden	3,700
Claveresk	Cuba	6,100

PHILADELPHIA

Vessel	Destination	Tons
Eagle Wing	Mayport	1,900
Logan[10]	Boston	
Temple[10]	Boston	
H. Clay[10]	Boston	
Tamanend[10]	Augusta	
Cleona[10]	Newburyport	
Buck Ridge[10]	Portsmouth	
Royal Sceptre	Rio de Janeiro	
Eagle Hill[10]	Marblehead	
Neshaminy[10]	Brookline	
Tohickon[10]	Milton	
Macungie[10]	Brewer	
Tabor[10]	Bangor	
Monitor[10]	Portland	
Rosebank[11]	Valencia, Spain	
Geo. Pyman[11]	Barcelona, Spain	
C. A. Donnell	Mayport	
A. B. Sherman	Charleston	510
Mingo[10]	East Cambridge	
Marion[10]	Charlestown	
Thomaston[10]	Milton	
Moselem[10]	Bangor	
Manatawny[10]	Augusta	
Cacoosing[10]	Thomaston	
Helvetia	Jacksonville	800
Beechwood[10]	Brookline	
Preston[10]	East Cambridge	
Bethayres[10]	Everett	
Elk Garden[10]	Providence	
H. A. Allyn[10]	Boston	
C. F. Pritchard[10]	Boston	
Shawmut	Mayport	
J. F. Seavey	St. John's, N. B.	

NEW YORK

Vessel	Destination	Tons
Berwind	Santiago	27
Nederlanden	Carupano	126
M. N. Cobb	St. John	700
T. H. Lawrence	St. George	543
Southerndown	St. Nazaire	5,448
S. P. Bowers	New Brunswick	959
Ed. Stewart	"Canada"	651
Caracas	Venezuela	10
Ancona	"Italy" (Coke)	265
Palmetta	Nova Scotia	174
Capac	Chile	450
Mexico	Mexico	25
Calamores	Panama	9
Glance	Norway (Coke)	977

[1] Pocahontas Fuel Co. [2] Smokeless Fuel Co. [3] Hasler Bros. [4] Flat Top Fuel Co. [5] W. C. Atwater Co. [6] New River Coal Co. [7] Baker Whiteley [8] Berwind White. [9] Md. Coal & Coke Co. [10] Phila. & Reading C. & I. Co. [11] Berwind White C. M. Co.

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	To	Tons	Rate
Helvetia	Jacksonville	424	1.10
C. A. Donnell	Mayport	990	1.00
E. M. Willey	Mayport	735	
J. F. Seavey	St. John	336	
Harflete	Italy	3,021	
J. M. Haynes	Cay Francis	683	3.00
R. P. Murphy	Martinique	572	3.90
Annie	Casilda	1,000	4.00

BALTIMORE

Vessel	To	Tons	Rate
Atland	Swedish[1]	2,744	
Moldegaard	Havana	1,788	
Poviga	Italy	2,057	
C. A. Campbell	Mayport	1,493	
Jean	Mayport		
New Sweden	Sweden		
Grekland	Sweden	1,671	

[1] Port

VIRGINIA

Vessel	To	Tons	Rate
C. E. Look	San Domingo		457
Fauna	Trinidad	728	

ATLANTIC RANGE

Vessel	To	Tons	Rate
G. E. Dudley	Macoris	387	

OCEAN FREIGHTS

The freight market is much firmer than a week ago, and is still advancing; new high levels are being reached on time charters in grain and other trades. Tonnage is very scarce and steamers difficult to obtain; none of the few steamers that have been chartered for export coal, since our report was issued, have been reported.

We would quote freight rates on coal by steamer as follows:

To	Rate	To	Rate
Havana	$2 50@2 75	Bermuda	$3 00@ 3.25
Cardenas or Sagua	2.75@3.25	Vera Cruz	4 75@ 5.00
Cienfuegos	3.00@3.50	Tampico	4 75@ 5.00
Port au Spain, Trinidad	3.75@4.00	Rio	9.60@10.32
St. Lucia	3.75@4.00	Santos	9.84@10.56
St. Thomas	3 25@3.50	Montevideo	9.60@10.80
Barbados	3.75@4.00	Buenos Aires or La Plata	9.60@10.80
Kingston	3 00@3.25	Rosario	10.80@12.00
Curacao	**3.50**	West Coast of Italy	15.60@16.80
Santiago	3 25@3.50	Barcelona	13.20@15.60
Guantanamo	3 25@3.50	Valparaiso or Callao	7.50
Demerara	5.50@6.00	Marseilles	14.40@15.60

* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British steamers; neutral steamers are more difficult to obtain and the rates are always higher.

W. W. Battie & Co.'s Coal Trade Freight Report.

LAKE MARKETS

PITTSBURGH

Labor supply growing scant. Car shortages exercise important influence. Considerable export movement. Prompt prices about 5c. higher.

Labor supply has become still more a factor in coal trade. Not much difficulty has been experienced as yet in the Pittsburgh coal district, but the Connellsville region is distinctly short of men and it is claimed more ovens could be put in blast, with a market for their product, if men could be gathered. Some of the Pittsburgh district mines are a trifle short of men. At present car shortages are more important than labor shortages. At many of the mines operations are being governed wholly by the car supply and while fair outputs are obtained on an average the operation is quite irregular; operations average 70 to 75% of capacity.

The demand for coal for export both to Canada and through the Seaboard is increasing. Considerable mystery has attached to the coal export movement for months and a larger tonnage is doubtless going out than is generally reported. Indeed it appears that in some instances the business has been so handled that the coal operators themselves do not know that their coal is going into export channels. The market has undoubtedly stiffened in the past week or ten days and with no great change in the demand for local use the stiffening may perhaps rightly be attributed to export demand.

There is a little larger movement to retail dealers while the railroads are taking somewhat more coal. The iron and steel industry had already reached its maximum possible consumption, though there may be some stocking in the next few weeks. We quote free coal generally about 5c. higher, with Youghiogheny gas slack strong at 75c. and steam slack at a spread below, prices being in general as follows: Free coal: Slack, 60@75c.; nut and slack, $1@1.05; nut, $1.05@1.10; mine-run, $1.10@1.15; ¾-in., $1.20@1.25; 1¼-in., $1.25@1.30; on contract to Apr. 1. Slack, 85@95c.; mine-run, $1.15; ¾-in., $1.25; 1¼-in., $1.35, per net ton at mine, Pittsburgh district.

BUFFALO

Market strong but not booming. Prospect of greater activtiy later. Many reports of car shortage. Some roads short of low-sided cars for the first time.

Bituminous—The former steady improvement continues. However, close observers say that home business is not yet up to the normal and except for the business that hinges on the war, the general volume would not be large. It is the export trade and the war orders that keep up our activity.

Still the condition of the railroads shows that an enormous volume of business is being done. Certain Pennsylvania roads are short of gondola cars for the first time in their history. The grain trade is taxing all roads in this vicinity to provide adequate motive power and that reduces their capacity for moving coal. There is not much complaint of coal on track unsold, but the mines would flood all markets if they could get the cars. It is impossible to get sufficient cars for more than a fair increase of output.

Bituminous prices grow stronger each week, though it is noted that certain Pennsylvania companies, are accused of putting out fictitious prices to stave off orders. Following are representative figures:

	Pittsburgh	Allegheny Valley	Penn. Smokeless
Lump	$2.65	$2.45	$2.55
Three-quarter	2.55	2.35	....
Mine-run	2.45	2.25	2.30
Slack	2.25	2.15	2.30

Prices are f.o.b. per short ton to Buffalo and Rochester points and per long ton east of Rochester.

Anthracite—The trade increases steadily, but has hardly reached the normal mid-autumn volume, on account of the mild weather. The demand will come with a rush after awhile, but there is a growing idea that it is not going to be enough to offset the dullness that prevailed all summer. It is noted that a great many families are doubling up for the winter to save fuel, especially in Canada, where business in much duller than it is here. Shippers of independent anthracite report some premiums received, but this is only in special cases. Prices are about on a par with the circular, as follows, per long ton, f.o.b. Buffalo: $5.60 for grate, $5.85 for egg and stove, $6.10 for chestnut, $4.30 for pea, $3.25 for buckwheat, $2.75 for rice, $2.50 for barley, and $2.25 for screenings, with 25c. extra for delivering on Lake vessel. Lake shipments for the week were 104,000 tons.

TORONTO, CAN.

Anthracite fair. Bituminous slow except on slack which is strong. Car supply short.

Anthracite for domestic purposes is in fair demand, but bituminous is not moving so freely. The principal feature of the market is the scarcity of slack, owing to the shortage of cars, which is holding back deliveries. The wholesale price of slack has advanced and is likely to go higher unless transportation conditions improve. There are abundant supplies of other grades in stock, as dealers are anxious to provide against a shortage. Quotations per short ton, for best grades, are as follows: Retail anthracite, egg, stove and nut, $7.75; grate, $7.50; pea, $6.50. Bituminous retail steam, $5.25; screenings, $4.25 to $4.50; domestic lump, $6; cannel, $8. Wholesale f.o.b. cars at destination, three-quarter lump, $3.79; screenings, $3.15.

COLUMBUS

Continued improvement in the Ohio trade. Steam trade is stronger and domestic demand holding up well despite the warmer weather. Prices strong all along the line.

Strength is still the chief characteristic of the coal trade in Ohio. With the continued expansion in manufacturing, there is a stronger demand for steam grades and despite the warmer weather there is also a steady call for domestic sizes. Strength is shown in the price list on all grades.

Iron and steel manufacturing is decidedly on the upturn and this is reflected on the coal trade to a marked degree. Manufacturing in other lines is also better and fuel requisitions are gradually increasing. Purchasing agents are showing a disposition to buy for the future and orders for shipment in November and December are noted. Railroads have about concluded stocking operations, although there is still a good demand for railroad fuel in certain sections. Contracting for steam tonnage is rather active.

Retail trade has been good in spite of the unfavorable weather conditions. Dealers have been busy making deliveries and householders are now in the market for considerable stocks. Retail prices are strong and there are indications of an advance some time after Nov. 1. Dealers stocks are light. Coke is stronger and the same is true of anthracite.

The Lake trade is still active and there are indications of a rush from this time to the close of navigation. Bottoms have been chartered until insurance is off and very few empties are available. Dock prices are unchanged.

One of the worst features is the growing car shortage which is interfering with shipments.

Prices in Ohio fields per short ton, f.o.b. mines, are as follows:

	Hocking	Pomeroy	Eastern Ohio	Kanawha
Re-screened lump	$1.60	$1.65		
Inch and a quarter	1.50	1.50	$1.35	$1.50
Three-quarter inch	1.35	1.40		1.35
Nut	1.25	1.30		1.25
Mine-run	1.15	1.20	1.05	1.10
Nut, pea and slack	.70	.75	.55	.60
Coarse slack	.60	.65	.45	.50

Mines have been working at about the following percentages of full capacity:

District	Week Ended				District	Week Ended			
	Oct. 2	Oct. 9	Oct. 16	Oct. 23		Oct. 2	Oct. 9	Oct. 16	Oct. 23
Hocking	50	50	55	60	Cambridge	45	50	60	60
Jackson	25	30	40	60	Massillon	45	55	60	45
Pomeroy	80	75	85	65	Eastern O.	80	80	85	85
Crooksville	40	45	50	85					
					Average	52	55	62	65

CLEVELAND

Warm weather has cut deeply into the immediate demand. Market rather soft at the opening of the week. Receipts light.

Domestic coal was at a low point Monday when Pocahontas lump and egg were sold on track here at $3.50 and mine-run at $2.75. These prices were due entirely to a warm day that prevented dealers selling domestic coal. Prices being asked by Fairmont operators are prohibitive so far as the local market is concerned and one or two jobbers who sold short are having considerable trouble covering at a price that will let them out.

Between 250 and 300 cars were received over Sunday, but the warm weather reduced the demand for coal as heating plants were not fired or, if they were, they were using the minimum amount of fuel. There was no sign of price cutting except on domestic fuel, the steam grades being a safe proposition to hold for a few days.

The Lake trade shows very little change. The car shortage is preventing much increase in shipping and orders from the Northwest are not pressing.

Jobbers are being quoted at the following prices f.o.b. Cleveland per short ton:

	Poca-hontas	Youghio-gheny	Fair-mont	Berg-holz	Ohio No. 8
Freight rate......	$1.45	$1.00	$1.15	$0.70	$0.90
Lump	3.60				
Lump, 6-in........				2.30	
Lump, 1¼-in.		2.40		2.10	2.15
Lump, ¾-in......		2.30	2.15	2.00	1.95
Egg..............	3.60				
Egg, 6-in				1.90	
Mine run.........	2.75	2.15	2.05	1.85@1.90	1.85
Slack............		1.80@1.85	2.00	1.65	1.65@1.70

DETROIT

Steam coal buying is steady. Demand for domestic sizes weak. Anthracite active. Lake movement still below normal.

Bituminous—Growth of business in various manufacturing lines is creating a broader market for steam coal. Orders continue mostly for small tonnage, but the business is expanding into a steady demand and regular buying, with fine coal especially active. Domestic demand has not been up to expectations, due to continued high temperatures.

Prices are in most instances maintained at close to the circular. For Hocking domestic lump, the mine price per short ton is about $1.50, with three-quarter lump at $1.25 and the mine-run at about $1. Jackson Hill domestic lump is $2.50; West Virginia gas three-quarter lump, $1; mine-run, 90c.; slack, 75c.; splint three-quarter lump, $1.10; slack, 60c.; mine-run, 85c.; Kentucky splint lump, $1.65; Pittsburgh No. 8 three-quarter lump, $1.10; smokeless lump and egg, $2.25; nut, $1.75, and mine-run, $1.40.

Very little difficulty is now reported from consignment stock, though sales of lump and egg sizes are made occasionally below list to clear tracks.

Anthracite—Retail dealers are having a satisfactory business. Stocks, however, are holding out well and they are still cautious in giving renewal orders. Delivery is being delayed by car shortage in the mining regions.

Lake Trade—Bituminous shipments are not up to those of previous seasons and are being handled very largely by vessels carrying iron ore down. The movement of hard coal is about normal. Reports from the Canadian and American head of the lakes denote larger shipments are being made from unloading docks to consuming points.

TOLEDO

Lake coal moving as navigation season draws near, close. Steam trade improved.

The market continues rather colorless. There has been quite a movement of Lake coal and the docks are fairly well loaded as the navigation season draws nearer to a close. Steam trade here is improved, due partially to the heavier operation of many factories and also to the improved situation on the railroads. Nut, pea and slack are in unusually good demand. Domestic coal is not as active as might be expected owing to the recent mild weather. Prices are unchanged as follows:

	Poca-hon-tas	West Virginia	Hock-ing	Pom-eroy	Jack-son	Mass-illon	Ken-tucky	Pitts-burgh No. 8
Lump......	$2.25	$1.40@1.85	$1.60	$1.65	$2.50	$2.50	$1.75	$1.25
Egg........	2.25	1.00@1.25	....	....	....	....	1.25	1.20
Mine-run...	1.40	.85@1.00	1.10	1.10	2.50	....	.90@1.10	1.00
Nut........	....	.90@1.15	1.25	1.25	....	2.50	.90@1.15	.....
Nut, pea and slack.	....	....	.65	.65	.60	....	.40@ .60	.60@.75

CINCINNATI

Labor and car shortage and improving demand the dominate features. Prices stiffening. Orders difficult to handle.

Continuance of constructive factors has stimulated the market materially and there is a rather noticeable shortage even with the comparatively small demand. While the weather has not yet been severe, there has been plenty of frost at night, which has served to bring consumers into the market for heating fuel. The continued improvement in the industrial situation, led by the steel and machinery trades, is expected to develop a normal demand for steam coal all through the winter, and all that the trade now needs is a sufficient supply of rolling stock and labor.

COKE

CONNELLSVILLE

Sharp advance in prompt furnace coke continues. Efforts to start additional ovens encounter labor scarcity. Foundry coke likewise higher. Production and shipments slightly increased.

The scarcity of spot furnace coke has become more pronounced and higher and higher prices have been bid, reports having it that $2.75 has already been paid in several instances, though bids at this writing are usually about $2.60. There has been an advance of nearly 50c. in a week and of fully 75c. in two weeks. Operators have been making strenuous efforts to get additional ovens into blast since this sharply advancing movement started, but have met with indifferent success, on account of the shortage of men. The Republic Iron & Steel Co., which was buying for a while at the rate of perhaps 2,000 tons a day, is said to require outside coke still as its additional 75 byproduct ovens are only being put in blast this week and it may be some time before their full output is realized, while the company's beehive plant in the Connellsville region was recently closed, to ship coal to the new plant.

Negotiations on furnace coke contracts are somewhat disturbed by the advance in prompt coke as operators are disposed to hold out now for higher prices. Foundry coke has stiffened sharply, for with fairly remunerative prices offered for furnace coke there is a disposition on the part of some operators to give less attention to the foundry coke trade. As high as $2.85 has been paid on carload lots of spot foundry in the case of the best brands. When contracts were made last May and June the operators were disposed to restrict the period to six months instead of the usual twelvemonth, and it is expected considerable contract demand will now develop for the first six months of next year. We quote: Spot furnace, $2.60@2.75; contract furnace, $2.25@2.50; spot foundry, $2.60@2.85; contract foundry, $2.60@2.85, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Oct. 16 at 421,091 tons, an increase of 3,367 tons, and shipments at 422,645 tons, an increase of 4,567 tons.

Buffalo—The prices on all grades of coke are strong. It is found so hard to obtain all the cars required that the actual demand cannot be supplied at all readily. The consumption increases steadily and promises to continue so for sometime yet. Most producers have withdrawn all quotations, but local jobbers still quote best 72-hr. Connellsville foundry at $4.40 and stock coke at $3.45.

New York—Prices for coke took a jump during the week and quotations for foundry coke were at $3 subject to quick acceptance.

Chicago—Furnace and foundry coke are still in a strong position. Orders for foundry coke have shown further gains. Domestic sizes are easier due to weather influences. Prices per net ton f.o.b. cars Chicago are as follows: Byproduct foundry, $5@5.25; byproduct domestic, $4.65@4.90; Connellsville, $4.85@5; Wise County, $4.85@5; gas coke, $3.90@4.15.

MIDDLE WESTERN

GENERAL REVIEW

Car shortages prevalent. Warm weather causes slackening in domestic orders. All bituminous prices firm. Anthracite active. Mines still behind orders. Screenings stronger.

Notwithstanding the continuance of warmer weather, which has prevented domestic coals from developing as rapidly as expected, remarkable strength is noted in the trade and the demand is well distributed on all grades. An increasing slowness in the movement, due apparently to car shortages, is causing many retailers considerable anxiety. Most country retailers are reported to be taking but little stock in the possibility of a miners' strike next spring.

It is difficult to buy any large quantities of the coarser sizes without paying full circular prices. No consignment coal is on the market. Current domestic shipments from the mines are all being made within the limits of price schedules, and what slight concessions are made apply only to shipments for the Chicago district. Some of the western railroads are finding difficulty in providing enough cars to load their contract orders.

Buying of steam coals is confined mostly in small quantities, though orders are so frequently renewed that the aggregate tonnage is considerably more than at any time since last winter. Western screenings have advanced 5c. to 10c. per ton and operators are receiving two to three times as much revenue for fine coal as they did at this time last year. Some Illinois operators are considering storing screenings on the ground if the demand continues below production.

CHICAGO

Mild weather causes a slowing up, but the market has not lost ground. No Eastern coals offered and some shippers behind on their contracts. Car and labor supply short. Anthracite active.

Shipments of all grades from Franklin County are keeping up at a steady rate. A slight recession has occurred in the domestic ordering due to warmer weather, but screenings and other steam coals are strong. Some heavy sales of Southern Illinois screenings for storage purposes have been made. Saline County screenings are exceptionally strong. Carterville mines have had poor car supply, some of the mines being closed down for one or two days.

Springfield district coals show little change. Screenings are averaging from 40c. to 50c. per ton, and domestic sizes have been well maintained in the face of the higher temperatures.

The Indiana domestic demand has slowed up somewhat. With the advent of cold weather again the retail trade will probably be in full swing, so that a great many dealers are piling up stocks. Buying of Indiana steam coals continues on a hand to mouth basis, and very few manufacturers have laid in a supply for winter use.

The small sizes of Hocking coal are eagerly sought Steam business is quite brisk, and the Lake trade is reported still active and is expected to continue so until the close of navigation.

Kentucky prices are firm. The car supply has become quite a problem and some of the mines have only been able to operate half time; a number of mines are behind on their contracts from a week to ten days, and the car and labor situation shows no prospect of improvement. It is confidently expected therefore that much higher prices will prevail for Kentucky production very shortly.

Anthracite demand is brisk, with a satisfactory increase in both mail and wire orders. Dealers report delayed movement and orders from far Western points are arriving in increasing numbers. Improvement in distribution is quite pronounced.

Quotations in the Chicago market are as follows:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump	$1.75@1.85	$1.50@1.65	$1.50@1.70	$1.35@1.50	$1.40@1.60
Steam lump	....	1.20@1.30	1.15@1.30	1.25@1.30	....
2½ and 3-in. lump	....	..	1.40@1.50	1.15@1.25	1.30@1.45
1¼-in. lump	....	....	1.25@1.30	1.10@1.20	..
Egg	1.75@1.85	1.50@1.65	1.15@1.25	1.10@1.15	1.15@1.25
Nut	1.10@1.25	1.60@1.65	1.00@1.10	.95@1.10	1.00@1.05
No. 1 washed	....	....	1.50@1.60	...	....
No. 2 washed	....	..	1.40	...	...
No. 1 nut	1.75@1.85	....	....	...	...
No. 2 nut	1.40@1.50		....		...
Mine-run	1.10@1.25	1.05@1.10	.85@.95	.95@1.05	.85@1.05
Screenings	.60@.85	.40@.50	.45@.55	.55@.65	.75@.80

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.65@1.75	$1.60@2.10	$2.25	$1.75@2.00	$1.60@1.75
1¼-in. lump	1.25@1.30	....	....	1.35@1.50	1.40@1.50
Egg	1.65@1.75	1.35@1.75	2.15@2.25	1.65@1.85	
Nut	1.25	1.25@1.35	....	....	1.30
No. 1 washed	1.75@1.85	....	....	....	....
No. 2 washed	1.40@1.50	....	..		...
Mine-run	1.00@1.15	....	1.40	1.25@1.40	1.10@1.15
Screenings	.60@.70	.60@.70	...	....	.65@.75

Splint, 3-in. lump, $1.35@1.60; 1¼-in. lump, $1.25@1.35.

DULUTH

Gradual and steady increase in shipments of commercial coal. Receipts light.

Shipments of the past week are fully up to the average, although the mild weather has curtailed retail business to a certain extent. Shipments for September amounted to 24,712 cars as compared with 24,347 cars for the same month last year, an increase of 365 cars over 1914 and 678 cars for the same month in 1913. These figures would indicate a gradual and steady improvement and the various managers of the dock companies are optimistic as to the future.

Receipts continue light, the vessel owners and managers find it more profitable to ship grain at the present rates, than to carry coal. Quotations per short ton, f.o.b. cars Duluth are as follows:

	Yough.	Splint	Hock.	Smokeless	Elkhorn
Lump	$3.40	$3.40	$3.40	$4.75	$3.75
Dock-run	3.10	3.10	3.05	3.25	3.25
Stove or nut	3.40	3.40	3.40	4.75	3.65
Screenings	2.40	2.40	2.25	2.75	2.40

The mild weather throughout this territory during the last ten days has caused quite a shrinkage in the shipments of anthracite, the retailers finding it impossible to induce their customers to stock up. However, it only remains for a few days of cold weather to start a regular buying boom in this commodity. Quotations f.o.b. cars per short ton, are as follows: Egg and stove, $6.85; nut, $7.10; pea, $5.55, and buckwheat, $4.

ST. LOUIS

Mild weather slows down the market. Screenings in good demand. Over-production of Standard grades.

The persistent fair and fine weather has caused a continuance of stagnant market conditions. There was only a light movement and that was mostly in the left-over output of the week before, when there was a touch of winter. Price changes were slight. The week closed with Williamson and Franklin County screenings short and tightening up and Standard and Staunton heavy on account of recent over-production.

Quotations f.o.b. mines during the past week have ranged on following basis per short ton:

	Frk. Co.	Wmsn. Co.	Staunton	Standard
6-in. lump	$1.50@1.75	$1.50@1.75	$1.25@1.35	$1.20@1.25
2-in. lump	......	......	1.15@1.20	1.10
3x6 egg	1.40@1.75	1.40@1.65	......	1.00
2x6 egg	......	......	......	.80@.85
No. 1 nut	1.50@1.75	1.50@1.75	......	.80
No. 2 nut	1.40@1.50	1.40@1.50	....	.55
No. 1 washed	......	1.65	1.50	....
No. 2 washed	......	1.25	1.10@1.25	....
No. 3 washed	......	1.25	1.10@1.25	...
No. 4 washed	......	1.20	1.05	
No. 5 washed	......	.60@.70	.50@.60	....
Screenings	.40@.50	.40@.50	.20@.25	.20@.25

Freight rates—Inner group, St. Louis 57½c., East St. Louis 37½c. Outer group, St. Louis 72½c., East St. Louis 52½c.

INDIANAPOLIS.

Indiana mines on about normal schedule. Railroads good buyers and industrial situation improved. Prices generally unchanged. Minimum quotation for screenings 55c. f.o.b. mines.

The weather has been too warm for a further improvement in the better conditions that have been prevailing recently, but the market has held its own. While the mines are not up to their maximum winter schedules, they are probably within 25% of it in the chief fields. The larger companies report that their surplus coal is well cleaned up notwithstanding the slackening in demand due to the higher temperatures.

Fair prices for slack are still obtainable, 55c. seeming to be the bottom for Nos. 5 and 6. The demand for No. 4 from gas producing plants and other users of high quality screenings is such as to maintain the price at 80c. Railroads continue to be good buyers and coal operators believe this is an indication that roads see better times ahead. They are still able to supply cars enough to meet current requirements, but there is considerable talk about a car shortage generally.

PRODUCTION AND TRANSPORTATION STATISTICS

PENNSYLVANIA RAILROAD

The following is a statement of shipments over the P. R.R. Co.'s lines east of Pittsburgh and Erie for September of the current year and the nine months of 1914 and 1915, in short tons:

	September 1915	September 1914	Nine Months 1915	Nine Months 1914
Anthracite	783,307	983,442	7,603,051	8,020,105
Bituminous	3,901,402	4,050,102	31,678,900	33,864,642
Coke	1,152,668	733,479	8,378,576	7,561,858
Total	5,837,377	5,767,023	47,660,527	49,446,605

FOREIGN MARKETS

GREAT BRITAIN

Oct. 15—There is no improvement in the general position of steam coals, which are weak for all descriptions, owing to the lack of ready steamers. Quotations are nominally as follows:

Best Welsh steam	Nominal	Best Monmouthshires	$5.76
Best seconds	Nominal	Seconds	4.32
Seconds	$5.76	Best Cardiff smalls	4.08
Best dry coals	6.96	Cargo smalls	1.92

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—Chartering is on restricted lines especially for the Mediterranean. Tonnage is still scarce and rates are strongly maintained. Rates are approximately as follows:

Gibraltar	$6.72	Naples	$9.60	St. Vincent	$9.12
Marseilles	8.68	Alexandria	10.80	River Plate	11.44
Algiers	8.10	Port Said	10.80		
Genoa	9.60	Las Palmas	7.92		

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

+Indicates contracts regarding which official information has been received.

Recast

In the following table we give a list of all old contracts coming up for consideration during the ensuing week. The table gives our contract number, the name of the purchaser, city, tonnage and page on which the detail notice appeared.

No.	Purchaser	City	State	Tonnage	Page
1485	Rock Falls Elec. Lt. Plant	Rock Falls	Ill.	1,800b	576
1487	Carnahan Tin Plate Co.	Canton	Ohio	24,000b	576
1498	Fall City Brewery	Louisville	Ky.	3 cars[1]	577
1566	Cuyahoga Bd. Comrs.	Cleveland	Ohio	30a	699
1566	Cuyahoga Bd. Comrs.	Cleveland	Ohio	3,000b	699
1567	Adams County B. Com.	Hettinger	N. D.		699
1575	S. Hosp. Injured Persons	Fountain Springs	Penn.		700
1582	County Controller	Erie	Penn.		700
1585	Board of Education	Montclair	N. J.	660a	700

a Indicates anthracite coal. b Indicates bituminous. [1] Or four.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

No. 990—Kansas City, Mo.—The previous notice regarding this contract (p. 76) erroneously referred to it as for the General Hospital instead of the German Hospital, as it should have been. Address Board of Directors, German Hospital, Kansas City, Mo.

+1262—Des Moines, Iowa—This contract (pp. 324, 489, 660), which provides for furnishing the local School Board with approximately 8,000 tons of steam coal, was bid on as follows: Through 1⅜-in. screenings, $2; mine-run, $3; lump, $3.25; range, $2.75. Steam coal is used mostly on this contract, the former price ranging from $1.60 to $1.80. Address Secy. A. L. Clinite, Bd. of Edu., Des Moines, Iowa.

1501—New Orleans, La.—The Crescent Bed Co. has decided to confine its purchases to the open market, instead of contracting, as previously noted (p. 577). Address Pur. Agt. Peter Jung, Jr., Crescent Bed Co., Inc., Gravier and Broad St., New Orleans, La.

+1549—Trenton, N. J.—All the bids have been rejected on this contract (pp. 617, 699), which provides for furnishing approximately 3,500 tons of bituminous coal to the city pumping station and municpal building. It is understood that the city will readvertise for additional bids. Address City Chemist A. Parobek, City Hall, Trenton, N. J.

New Business

1588—Quechee, Vt.—The A. G. Dewey Co. at this place usually contracts about Nov. 1 for its annual requirements of coal involving approximately 12,000 tons of bituminous, 30 tons of anthracite stove and 30 tons of nut. This company has a storage capacity of 400 tons and deliveries are made by railroad. Address Pres. John J. Dewey, A. G. Dewey Co., Quechee, Vt.

1589—St. Louis, Mo.—The Liggett & Myers Tobacco Co. will receive bids until Nov. 1, for furnishing their annual fuel requirements for the fiscal year beginning Nov. 15. About 2,000 tons per month of No. 5 washed or 2-in. raw screenings will be required. Address Vice-Pres. R. D. Lewis, Liggett & Myers Co., St. Louis, Mo.

+1590—Trenton, N. J.—A city commission will receive bids until 2:30 p.m., Nov. 10, for furnishing coal to the Department of Parks and Public Property as follows: For the Pumping Station, 7,000 tons of bituminous to be delivered as required; for the Municipal Building, 50 tons of bituminous to be delivered on the first of November, January and March, and 100 tons to be delivered on Feb. 1. Complete specifications and blank contracts may be obtained on application to the Director of Parks and of Public Property on and after Oct. 6. All proposals must be accompanied by a certified check for $500. Address City Clk. Frank Thompson, Municipal Building, Trenton, N. J.

+1591—New Rockford, N. D.—The City Government will receive bids until 3 p.m. Nov. 1, for furnishing carload lots of lignite coal as may be required during the coming season. Address County Audr. James MacLachlen, New Rockford, N. D.

1592—Cincinnati, Ohio—The Cincinnati, Milford & Loveland Traction Co. usually contracts for their annual fuel requirements, involving approximately 5,000 tons of demurrage coal, some time during the fall. The company has a storage capacity of 600 tons, and deliveries are made by railroad at the rate of 100 tons per week. Address Pur. Agt. A. C. Wenzel, Cincinnati, Milford & Loveland Traction Co., 510 Sycamore St., Cincinnati, Ohio.

1593—Chicago, Ill.—The A. H. Andrews Co. will contract about Dec. 1 for 6,000 tons No. 3 raw and No. 4 washed Illinois or Indiana nut coal. Address Pur. Agt. Merrill, A. H. Andrews Co., Chicago, Ill.

+1594—Arvilla, N. D.—The County Government will receive bids until 10 a.m. Nov. 23, for furnishing the County Hospital with approximately 100 tons of Hocking Valley lump coal. Bids should be made f.o.b. siding at Arvilla. Address County Audr. Hans Anderson, Grand Forks, N. D.

+1595—Hollidaysburg, Penn.—The County Government received bids until noon Oct. 27, for furnishing and delivering approximately 700 tons of bituminous coal at the heating plant in the jail yard at Hollidaysburg, and approximately 80 tons to the Industrial Training Home at Williamsburg. The successful bidder will be required to furnish a bond for $300 guaranteeing the faithful performance of the contract. Deliveries are to extend over the period ending Dec. 31, 1916. Address County Controller T. W. Tobias, Hollidaysburg, Penn.

+1596—Kenmare, N. D.—The City Auditor at this place will receive bids until 8 p.m. Nov. 1, for furnishing coal for the various city departments as may be required during the ensuing year. Each bid must be accompanied by a bond for $200. Address City Audr. Evan Griffith, Kenmare, N. D.

+1597—Steubenville, Ohio—The Board of Education at this place will receive bids until noon Oct. 30 for furnishing coal as may be required at the public schools during the year beginning Nov. 1. Address Clk. W. S. McCauslen, Bd. of Edu., Steubenville, Ohio.

+1598—New Orleans, La.—The Public Belt Railroad Commission is receiving bids for furnishing their annual fuel requirements. A proposal form and specification for purchasing 10,000 tons, was drawn up on Oct. 22. The specifications provide for furnishing mine-run coal f.o.b. New Orleans. Address Secy. F. H. Joubert, Pub. Belt Railroad Com., 7th Floor, Municipal Bldg., New Orleans, La.

+1599—Devils Lake, N. D.—The Ramsey County Board of Commissioners will receive bids until 2 p.m. Nov. 2, for furnishing approximately 100 tons of Hocking Valley, Youghiogheny or Pocahontas mine-run or anthracite, egg or stove coal, or 200 tons of lignite coal to be delivered in the bins at the Court House. Address County Audr. J. A. Kramer, Bd. of County Comrs., Devils Lake, N. D.

+1600—Warrensburg, N. Y.—The Board of Education at this place received bids until 3 p.m. Oct. 2, for furnishing the coal required by School District No. 1 during the coming school year. Prospective bidders were required to specify the grade and quality, together with the price per ton delivered in the school building. Address Board of Education, Union Free School District No. 1, Warrensburg, N. Y.

+1601—Cameron, Mo.—The City Government at this place usually contracts for the coal required at the Municipal Light and Water Plant, about Dec. 1. Approximately 3,000 tons of nut and pea, through a 1½-in. and over ½-in. screen is required. Business is done on a competitive basis and the customary price is about $1.10 per ton, f.o.b. Cameron. Address Clk. Clarence Staples, Cameron, Mo.

+1602—Hootinger, N. D.—The Board of Education at this place received bids until Oct. 28 for furnishing approximately 50 tons of North Dakota screened lignite coal. Address Clk. Alex. Stensby, Bd. of Edu., Hootinger, N. D.

+1603—Krumroy Station, Ohio—The Board of Trustees of the Springfield Lake Sanitorium will receive bids until noon Nov. 20, for furnishing approximately 15,000 tons of 1½-in. nut, mine-run and ¾-in. screened coal. Bids will be received only on Ohio, West Virginia, Pittsburgh and Youghiogheny coal. The contract is to become effective Dec. 1. Bids will also be received for delivering the coal at the Sanitorium. Address Secy. F. L. Allen, Bd. of Trustees, Springfield Lake Sanitorium, Canton, Ohio.

1604—Chicago, Ill.—The American Malting Co. will be in the market about Dec. 1 for a year's supply of Indiana 1¼-in. screenings. This company consumes 60 tons per day. Address Purchasing Agent, American Malting Co., Chicago, Ill.

+1605—Frankfort, Ky.—Sealed bids will be received until noon, Nov. 18, for furnishing the State Capitol power house with nut and slack coal, and other buildings with lump coal. Bids are requested on Pittsburgh, Kanawha, Kentucky, Raymond City, Plymouth and Old Lee anthracite, stove and nut sizes. Bids will be considered on a heat-unit basis. Address Custodian Samuel M. Lykins, Capitol, Frankfort, Ky.

+1606—Napoleon, N. D.—The Logan County Board of Commissioners will receive bids for furnishing and delivering lignite coal to the local court house. All bids must be accompanied by certified checks for $50. Address Audr. M. W. Kelly, Napoleon, N. D.

+1607—Secaucus, N. J.—The Board of Education received bids until Oct. 26 for furnishing and delivering approximately 50 tons of pea coal and 50 tons of stove coal. Address Dist. Clk. John Bremmer, Bd. of Edu., Secaucus, N. J.

+1608—Sedalia, Mo.—The City Government will receive bids until 5 p.m. Nov. 1 for furnishing the city with coal during the period beginning Nov. 2 and ending June 1 of next year. Address City Clk. W. E. Gold, Sedalia, Mo.

1609—Kokomo, Ind.—The Indiana Railway and Light Co. usually contracts for their annual fuel requirements involving approximately 32,500 tons of Indiana screenings, some time during the fall. Deliveries are made by railroad at the rate of about 100 tons per day, and the company has storage capacity of 2,000 tons. Address Pur. Agt. R. M. Blackmore, Indiana Railway and Light Co., East Sycamore St., Kokomo, Ind.

+1610—Gascoyne, N. D.—Sealed bids are being received for furnishing Fischbein School District with coal as may be required during the coming winter. Address Clk. Gus E. Deutscher, Fischbein School District, Gascoyne, N. D.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

1184—Roaring Spring, Penn.—This contract (p. 244), which provides for furnishing and delivering approximately 100 tons of steam mine-run coal, has been awarded to the **Planing Mill Co.** at $2.05 per short ton. J. E. Gilliland bid $2.06 per ton. Address Secy. F. K. Lorenz, Roaring Spring Sch. Bd., Roaring Spring, Penn.

1431—Braddock, Penn.—This contract (p. 490), which provides for furnishing the Rankin School Board with three-quarter mine-run coal, has been awarded to **McCready Bros.,** at 8½c. per bu. Address Secy. H. W. Peters, School Bd. Braddock, Penn.

1476—Cedar Grove, N. J.—This contract (p. 531), which provides for furnishing the Essex County Hospital with approximately 19,000 tons of coal during the year beginning Nov. 1, has been awarded to **A. H. Ross & Co.** at $3.55 per ton. Address Supt. George C. Bergen, Pur. Dept., Room 206, Court House, Newark, N. J.

1486—Cooperstown, N. D.—This contract (p. 576), which provides for furnishing the Griggs County Commissioners with coal for the local Court House, has been awarded to the **Erick Erickson Co.** on the following basis: anthracite, $10.50; Hocking Valley, $7.25; Pocahontas, $7.75. Address County Audr. H. S. Rearick, Cooperstown, N. D.

+1489—Trenton, N. J.—This contract (p. 576), which provides for furnishing the State Home for Girls with coal, has been awarded to the **Philadelphia and Reading Coal and Iron Co.** on the following basis, prices not including the State Tax of 2½% of the cost of the coal at the mines: 700 tons of buckwheat at $2.50; 50 tons of chestnut, $5.85; 50 tons of stove, $5.50. Address Supt. (Mrs.) E. V. H. Mansell, New Jersey State Home for Girls, Trenton, N. J.

1492—Vintondale, Penn.—This contract (p. 576), which provides for furnishing the local school buildings with coal as required during the ensuing year, has been awarded to the **Vinton Colliery Co.,** on mine-run coal at $2.50 per ton delivered. This company was the only bidder on this business. Address Secy. George S. Blewett, Vintondale, Penn.

1495—Ashtabula, Ohio—This contract (p. 577), which provides for furnishing the Ashtabula County Commissioners with coal during the year beginning Oct. 15, has been awarded to the **Fairview Mining Co.,** at $1.99 per ton on mine-run coal and $2.09¾ for three-quarter inch screened lump. This company was the lowest of a number of bidders on this business. Address Clk. B. E. Brainard, Water County Comrs. Ashtabula, Ohio.

+1497—Cleveland, Ohio—This contract (pp. 577, 616, 699), which provides for furnishing the City Water-Works with its annual fuel requirements, involving approximately 75,000 tons of slack coal, has been awarded to the **Valley Camp Coal Co.,** the gross consideration being $145,000. Address Comr. of Purchases and Supplies A. R. Callow, 511 City Hall, Cleveland, Ohio.

+1502—Bismarck, N. D.—Awards have been made on this contract (p. 577), which provides for furnishing the various state schools with approximately 6,000 tons of coal, as follows: **North Dakota Lignite Mines Co.** (Dickson, N. D.), 5,000 tons of steam coal for the Agricultural College at Fargo, at $2.47; same company, 100 tons for the State School of Forestry at Bottineau, $2.65. **Washburn Lignite Coal Co.** (Wilton, N. D.), 100 tons for the State School of Science at Wahpeton, at $2.42; same company, 100 tons for the State Normal Industrial School at Ellendale, $2.30. **Interior Lumber Co.,** of Fargo, was awarded a contract for a small car of blacksmith coal and a car of anthracite for the Agricultural College at Fargo, and **J. E. Morris,** of Wahpeton, was awarded approximately the same amount for the State School of Science. Address Secy. Charles Brewer, State Bd. of Regents, Bismarck, N. D.

+1509—White Rock, S. D.—This contract (p. 577), which provides for furnishing the Board of County Commissioners with approximately 100 tons of bituminous and 15 tons of anthracite coal, has been awarded to **O. L. Axness & Co.** at $6 per ton for bituminous and $10 per ton for anthracite. Address County Audr. O. E. Lien, Bd. of County Comrs., White Rock, S. D.

+1511—Bedford, Ind.—This contract (p. 577), which provides for furnishing the Lawrence County Poor Farm with approximately 100 tons of coal, has been awarded to **Gale L. Wilking,** at $2.55 per ton for Indiana lump coal delivered at the farm. Address Audr. E. W. Edwards, County Comrs., Bedford, Ind.

+1512—Portage, Penn.—This contract (p. 577), which provides for furnishing Miller vein or C prime coal to the local schools during the ensuing year as may be required, has been awarded to **E. M. Eicher** at $2.10 per ton delivered. Address Secy. H. D. Border, School Bd., Portage, Penn.

1517—Sioux Falls, S. D.—This contract (p. 577), which provides for furnishing approximately 250 tons of bituminous and 50 tons of anthracite coal, has been awarded as follows: **A. S. Johnson & Co.,** Hocking Valley, $6.95; **Sioux Falls Fuel Co.,** anthracite, $10.60. W. A. Mills Co. bid $6.98 on bituminous and $10.70 on anthracite, and H T. Parmley bid $7 on bituminous, $10.75 on anthracite. Address Audr. H. H. Howe, Minnehaha County, Sioux Falls, S. D.

1520—Akron, Ohio—This contract (p. 577), which provides for furnishing the Summit County Court House, Jail and County Infirmary with coal, has been awarded to the **Alages Coal & Ice Co.,** at $1.75 per ton for Youghiogheny slack coal. The Akron Coal Co. bid $1.80 for the same, and the Citizens Coal Co., bid $1.65 for Cambridge slack. Address Clk. U. G. High, Summit County, Akron, Ohio.

+1527—Flandreau, S. D.—This contract (p. 616), which provides for furnishing the local City Government with 12 to 13 cars of Youghiogheny lump coal for use at the city pumping station, has been awarded to **O. A. J. Aaker.** Address Clk. J. R. Coonrod, Flandreau, S. D.

+1529—Glasgow, Mont.—This contract (p. 616), which provides for furnishing the Valley County Board of Commissioners with coal for the Court House and Jail during the coming year, has been awarded to **W. W. Hurd,** at $7.75 per ton for Bear Creek lump. Address Clk., W. B. Shoemaker, Bd. of County Comrs., Glasgow, Mont.

+1538—Wellsville, Ohio—This contract (p. 617), which provides for furnishing the local Board of Education with 1¼-in. Pittsburgh coal, has been awarded to **D. A. Forbes,** at $2.27½ per ton. Address Clk. F. H. Eckfeld, Bd. of Edu., Wellsville, Ohio.

+1539—Woonsocket, S. D.—This contract (p. 617), which provides for furnishing the Sanborn County Court House with coal during the coming season, has been awarded to the **J. F. Anderson Lumber Co.,** at $5.98 per ton. Other bidders on this business were Colman Lumber Co., $6.22; C. H. Holonel (Alpena, S. D.), $6.20; F. N. Thisen, $6.25; S. D. Grain Co., $6.75; Farmers Elevator Co., $6.37. Address County Audr. C. B. Jacobson, Woonsocket, S. D.

Contract Notes

Hillsboro, N. H.—The Hillsboro Woolen Mills Co. consume about 125 tons of bituminous coal per month.

Woodbury City, N. J.—The contract for furnishing 45 tons of Lehigh coal to the City Hall and Fire Houses has been awarded to **S. A. Stewart,** at $6.04 per ton, delivered.

Noblesville, Ind.—The contract for furnishing the Hamilton County poor farm with approximately 100 tons of coal has been awarded to the **Noblesville Fuel and Supply Co.** at $3.95 per ton.

Dallas, Tex.—The J. W. Thompson Construction Co. has renewed its contract with the **McAlester Fuel Co.** for 8,000 tons of steam coal to be used in construction of the Union Terminal at Dallas, Tex.

Jeffersonville, Ind.—Contracts for county coal have been let as follows: 90 tons nut and slack, **F. M. Rose Coal Co.,** $2.45; 80 tons lump, **Drabelle-Yager Co.,** $3; 40 tons lump, **St. Bernard Mining Co.,** $3.35.

Lincoln, Neb.—The contract for furnishing the Police and Fire Department with coal during the year beginning Sept. 6 has been awarded to the **Easley-Graham Coal Co.** at $10.45 per ton for Pennsylvania anthracite nut.

Lockland, Ohio—The contract of the Philip Cary Manufacturing Co., involving 10,000 tons of coal, has been awarded through the **Kentucky Fuel Co.,** of Cincinnati, on the Loony Creek Coal Co.'s "Loony Creek" nut and slack coal.

Lewiston' Maine—The Lewiston "Journal" Co. has awarded a contract for furnishing 375 tons of New River coal to the **Pulsifer & Young Co.,** of Auburn. Of this, 200 tons is already delivered and the remainder will be delivered as needed.

Auburn, Maine—The Androscoggin Foundry Co. has awarded a contract for 16 cars of Jamison coke at $6 a ton to **Rogers, Brown & Co.,** of Boston. This contract expires in June, 1916. The coke will be delivered f.o.b. Auburn on M. C. R.R. tracks.

Fitchburg, Mass.—Crocker-Burbank Co., paper manufacturer, has awarded a contract for approximately 50,000 tons for the 12 months from Oct. 1, 1915, to the **Consolidation Coal Co.** on Georges Creek coal for delivery via water to Mystic Wharf, Boston.

Memphis, Tenn.—Memphis coal dealers recently announced a flat increase of 15c. per ton on Kentucky and Illinois coal, on account of the recent increase in freight rates. The increase will figure 15c. on 10 barrels to domestic users and 15c. per ton to steam users.

Houston, Tex.—Cargo of 2,800 tons of coal from Philadelphia on board the steamship Wilhelmina, consigned to J. H. Carroll, reached Houston on Oct. 23. The coal is for distribution to various coal yards in the interior of Texas, and will be shipped out by rail.

McAlester, Okla.—The contract for furnishing the local School Board with 500 tons of McAlester nut coal was awarded on Oct. 9 to **William Mullen** at $2.95 per ton. This is at 20c. below the contract price last year. Address Secretary School Board, McAlester, Okla.

Edmonton, Alberta, Canada—The contract for supplying the Civic Building with coal during the coming season has been awarded to the **Edmonton Standard Coal Co.** at $2.60 per ton for screened lump coal. Six bids were submitted on the business at prices ranging from $2.60 to $3.25 per ton.

Detroit, Mich.—The Detroit Copper and Brass Rolling Mills Co. has awarded to **Jewett, Bigelow & Brooks** the contract for supplying about 10,000 tons of nut, pea and slack to be delivered at the company's plant, Detroit. The price is not made public, but is understood to have been around $2.15.

Knoxville, Tenn.—The contract for coal for the City of Knoxville was not let by the old board, but has been brought over to the new board, just elected and installed. This new board has referred the matter to City Commissioners N. T. Little and J. G. Crumbliss, and it is said they will readvertise for bids.

Netherlands—Coal, selling prices Rotterdam, steam $7, gas $10; ocean freight, $9.50 per metric ton; imports materially reduced from previous years. Netherlands Oversea Trust will receive shipments for strictly Dutch firms. There is a so-called coal bureau which is designed to distribute to small consumers.

Ames, Iowa—The Electric Light & Water Department at this place consumes about 6,000 tons of steam coal per annum. The business is not done on competitive bids, and there is no contract. The usual price is about $2 per ton on track at Ames. Address Supt. Charles E. Warsaw, City of Ames, Electric Light and Water Dept., Ames, Iowa.

Detroit, Mich.—A contract for furnishing the United States Engineer Service at Sault Ste. Marie with 200 tons of three-quarter lump coal has been awarded to the **George Kemn Coal Co.** at $2.90 per ton. The Perry Coal Co. bid $2.90 and the Port Royal Dock Co., $3. Address Supt. L. C. Sabin, American Falls of St. Marys River, Sault Ste. Marie, Mich.

St. Joseph—The contract to furnish coal during the coming year for the Missouri State Hospital for the Insane at St. Joseph has been awarded to the **Pickering Coal Co.** of Richmond, Mo. It is claimed that this contract is awarded after an investigation as to the system of mining and a test of several car loads. The amount of coal consumed is about 10,000 tons.

Savannah, Ga.—Forty thousand tons of steam coal were bunkered from lighters in Savannah during the first six months of this year. Contracts are now pending whereby this business will be transferred to Charleston, N. C., the vessels taking bunkers from the new Southern Ry. coal terminals plant recently opened there. The greater part of this new Charleston fuel business will be done in Clinchfield coal.

Topeka, Kan.—The County Commissioners have let the contract for the coal supply for the ensuing year to the **Topeka Cold Storage, Ice and Fuel Co.,** at $3.24 per ton, and the **Topeka Coal Co.** on coarse mill at $2.85. It also contracted for Osage lump for the indigent poor to the **Topeka Coal Co.** at $3.72. For the poor farm, Osage lump coal to the **Jackson-Walker Co.** at $3.17. For the Crittendon Home to the **Southwestern Coal Co.,** on Osage lump, $3.80.

Toledo, Ohio—The Board of Control has awarded a number of small contracts for various city departments. The **Big Four Coal Co.** was given the contract for 500 tons of Pocahontas mine-run at $2.75 for the House of Correction, 50 tons of Hocking lump to the fire department at $3.25, and 180 tons of Pocahontas mine-run to the police department at $3.25. The **West Crescent Coal Co.,** Toledo, will supply 100 tons of Jackson lump to the county hospital at $4.25.

Auburn, Maine—The contract for the supply of coal for heating the Androscoggin County buildings was awarded to **W. E. Cloutier & Co.,** of Lewiston. Georges Creek coal was specified and about 500 tons are used during the year. There is storage capacity for 150 tons and this amount was delivered, the remainder to be supplied as needed. The contract price was less than $4.75. This contract expires in July, 1916, and is advertised for by the County Commissioners. George Pottle is chairman.

Boston, Mass.—It is understood that the Bay State Ry. has recently purchased an extra supply of low volatile steaming coal amounting to approximately 15,000 tons. For the regular contract of this company, involving about 156,000 tons, see contract 802, Vol. 7, pp. 1005, 1085, 1128. This latest purchase provides for 9,000 tons to be delivered alongside power stations, Quincy Point, Mass., and 3,000 tons each to Lynn and Chelsea, Mass. Deliveries are to be completed in 60 days. It is understood that the Quincy Point order was awarded to the **Chesapeake & Ohio Coal Agency** on New River coal and the Lynn and Chelsea portions to the **Consolidation Coal Co.** on Georges Creek coal.

Billings, Mont.—The contract for furnishing Yellowstone County with coal for the coming year was let to the **Hallowell Coal and Feed Co.,** their bid being the lowest. This contract calls for approximately 1,500 tons of coal. The successful bid follows: No. 1 lump coal, delivered at the court-house, county jail and poor in Billings, $4.40 per ton; delivered at the county poor farm and detention hospital, $5.25 per ton. The other bids were: Crystal Ice and Fuel Co., court-house and jail, $4.60 per ton; poor in Billings, $4.85 per ton; poor farm and detention hospital, $5.10 per ton. C. E. Tarr Coal and Ice Co., court-house and jail, $4.75; detention hospital and poor farm, $5.50; poor in Billings, $5.25. Billings Coal and Ice Co., court-house and jail, $4.75; detention hospital and poor farm, $5.50; poor in Billings, $4.90.

Kansas City, Mo.—The contract for furnishing the local City Water-Works with coal (p. 286), which was announced as being awarded to the Central Coal and Coke Co. at $2.20 per ton for mill and $2.05 per ton for slack, failed to be approved by the City Council, and is still being considered. Bids received on the contract were as follows:

	Slack	Mill Run	Nut	Cherok. M.-R.	Washed Slack	Screen. Lump
Central Coal & C. Co.	$2.05	$2.20	$2.54	$2.40	$3.05	$2.64
Cherokee Fuel Co..	2.05	2.30	2.45	2.30	3.05	2.55
Gray-Bryan S. C. Co.	2.05	2.25	2.60	2.45	3.05	2.70
K. C. Coal & Mat. Co..	2.05	2.30	2.55	2.55	...	3.05

For the fiscal year 1914 there was used 6,960 tons of slack, 24,607 tons of mill-run and 717 tons of nut coal. There were no other kinds of coal used. Address Pres. J. D. Eubank, Bd. of Fire and Water Comrs., Kansas City, Mo.

COAL AGE

ONE OF THE HILL ENGINEERING WEEKLIES

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To All Coal-Mining Men

AT PRESENT the coal industry is in a position to support only one large paper devoted to its interests. Careful observation and actual experience have proved this fact. Two papers were attempting to cover the field—**The Colliery Engineer** as a monthly and **Coal Age** as a weekly. Each accomplished much, and the total effort of both acting independently was considerable, but there was a large loss due to an overlapping of fields.

Those readers who were desirous of missing nothing paid for both papers and received in return a duplication of articles that was, to say the least, not pleasing. The subscribers to only one of the two papers necessarily failed to keep themselves fully informed.

The logical thing has happened—**Coal Age,** with its youth, aggressiveness, broader field and greater comparative investment, has combined with **The Colliery Engineer.** The younger journal needed the age and prestige of its staid and sturdy contemporary.

Of the ten men who now fill the more important positions on the editorial and business staffs of the new paper that results from the consolidation, five were formerly employed by **The Colliery Engineer,** which fact makes it plain that the combine was actually a consolidation and not an absorption.

The new plans of this enlarged paper cannot be stated on a single page. However, they call for a continuation of each and every good feature of both journals. Any added income will go toward covering the cost of a more detailed editorial campaign designed to make **Coal Age** and **The Colliery Engineer** as one paper the most complete and the most satisfying engineering and trade journal in the world.

We want you to say: "**If it wasn't in Coal Age** it didn't happen."

The new paper will have 39 regular and staff contributors. These men are located in every important American coal-mining and fuel-consuming center. Two of them are in Europe and two in Canada gathering news and covering important coal developments. One man is traveling in South America, materializing dreams of foreign circulation in a market that will soon belong to American producers.

One member of the **Coal Age** staff is a lawyer—he handles all legal questions. Another is a doctor versed in first-aid and competent to advise along medical lines.

Five editors are graduate mining engineers of varied experience. Another member of the regular staff is a mechanical engineer who devotes his time exclusively to questions along mechanical and electrical lines.

If you want to know about a problem in law as it affects coal mining, a lawyer will tell you; if it's a question in medicine as it relates to first-aid or resuscitation, you will be advised by a doctor. Pump problems go to a specialist; so do questions on ventilation, gases, surveying, roof support, sociology, mining and the like.

In behalf of **Coal Age** we warmly welcome readers and friends of **The Colliery Engineer.** We will please you if you are interested in coal literature. You will pay us very little more, and in return will receive annually about 2,200 pages of carefully edited information, which compares with less than 700 pages you have heretofore been receiving. We invite you to contribute to our paper and to enter into our discussions. There is no reason why you should not receive a share of the $20,000 we pay for articles and news each year.

You old readers of **Coal Age**—in behalf of **The Colliery Engineer,** we bid for your friendship. As the oldest of all coal papers, it brings you something in the way of ripe experience that even the enthusiasm of youth can't duplicate. It brings you its loyal friends, many grown gray in the service; and what can improve on the winning qualities of seasoned experience when it is combined with the courage, energy and freshness of youth?

Ideas and Suggestions

Efficiency Index for Coal Mines

By Sheldon Smillie*

After a mine manager has solved all the knotty little individual problems of the mines under his control and things begin to work smoothly, he begins to wonder how his mines compare with other mines in his vicinity, whether better or worse and how much so. A knowledge of this would offer a direct line of attack for the improvement of his operation. Costs may be compared, but the large variety of methods employed and in many places their crudity make them of rather uncertain value, and in most cases a company is rather loath to impart this information.

Labor represents by far the largest percentage of the cost of production, and the most important feature therefore for the manager to know is whether his labor returns him as much as does that of his competitors. A recent writer has suggested a "labor factor," the ratio of the number of company men to the tonnage produced. This gives certain valuable comparisons for the immediate vicinity where the labor conditions may be all the same, but is subject to fluctuations in comparisons between all pick, puncher, shortwall and longwall mining, according to the division drawn between miners and others.

Efficiency of the daymen may be high, but the miners and loaders may be waiting for cars and not working to the best advantage. An extra employee here and there inside may not in himself be working to the best of his time, but he may be helping the miners to double their output. A better basis of comparison would appear to be one involving the output per man employed inside.

An Interesting Comparison

Some time ago I made up the accompanying table showing a comparison between the largest producers in the central Pennsylvania field operating on the thinner seams of coal, the Freeports and Kittannings, from data taken from the state mine inspector's report. These figures may be inaccurate in minor details, but are probably equally correct for all. The collieries are arranged according to the thickness of the seam, and the final tonnage is divided by the thickness of the seam in feet, so as to put all on an even basis. While the thickness of the seam does not affect the day labor as much as the miner, it does to a certain extent affect the former, for the thicker seams make fewer cars to handle per ton.

It will be noticed that there is a wide variation in the tonnage handled by the men outside the mine. This is to be expected, as conditions vary more widely outside than inside, the matter of picking probably having more influence than any other. Some companies purchase power, but I believe most of those on the list are so large they have found it economical to produce their own or are producing it, because their plants were installed before it was convenient to purchase power. All employees engaged in the manufacture of coke have been eliminated. With a general knowledge of the conditions existing in each case, a fairly reliable comparison should be reached.

PRODUCTION EFFICIENCY OF VARIOUS COMPANIES IN CENTRAL PENNSYLVANIA

Compiled from Mine Inspector's 1912 Report

Thickness of Coal, In.	Company	Tons per Man per Day: Inside	Tons per Man per Day: Outside	Tons per Man per Day: Inside and Outside	Foot-Tons	Standing
38	A	....	....	2.27	0.72	12
40	B	3.45	19.3	2.91	0.87	6
42	C	4.43	21.3	3.60	1.28	1
..	D	3.56	28.1	3.16	0.90	3
..	E	2.72	30.4	2.50	0.71	13
45	F	3.96	45.2	3.65	0.97	2
46	G	3.68	43.3	3.40	0.89	5
48	H	4.06	31.7	3.60	0.90	4
..	I	3.53	87.0	3.39	0.85	7
..	J	2.92	11.1	2.31	0.46	18
56	K	4.67	25.8	3.95	0.84	9
58	L	4.73	14.3	3.56	0.73	11
60	M	4.12	36.5	3.70	0.74	10
..	N	4.15	16.4	3.31	0.66	15
66	O	5.53	30.3	4.68	0.85	8
67	P	3.90	25.7	3.40	0.61	16
72	Q	4.77	34.4	4.12	0.68	14
..	R	4.27	20.7	3.52	0.58	17
Average			30.1		0.79	

In offering the above table which I shall call an "efficiency index," I do not consider that an absolute basis of comparison is reached, but merely one more satisfactory than any I have so far seen, and I hope that by starting a discussion of the subject more light may be shed on it.

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Mine Maps vs. Mine Sketches

By H. L. Fickett*

The laws of every state in which coal is mined require that periodically the operating companies file with the chief mine inspector certified maps of the workings of the mines operated by them. The object of such laws is obvious. These maps are the records by means of which the state will be able to estimate the amount of its mineral wealth consumed and to which posterity in time to come will refer for information.

The importance of these documents cannot be overlooked. Yet it is a well-known fact that many of the maps submitted are in reality but mere sketches, often beautiful from the viewpoint of the draftsman, but owing to abounding inaccuracies practically worthless to the operators.

In such sketches the letter of the law has been fulfilled, but the spirit has been neglected. Large companies have long since come to realize the value of accurate maps, because at some time in their career one of these sketches has caused the expenditure of thousands of dollars that would have been saved if the information had been reliable. Hence these suggestions are more to the small operator, with the hope that he may realize that to neglect or slight his maps is not economy, but extravagance in the long run.

Since the coal companies' stock in trade is the coal that lies beneath the ground, it is important that they, like the merchants, keep an accurate record of that which is taken out and that which is left. Their maps furnish the only means of taking an inventory. If they have been accurately made, at the end of their examination of the maps the operators will know as much concerning their assets as the merchant who has been able to see and to touch each article in his establishment.

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*Indiana, Penn.

*Belle Ellen, Ala.

The nature of mining makes it impossible after a short time to inspect the workings, especially if there has been any robbing. Then it is that the map asserts its value and furnishes the best means for locating blocks of coal that have been left untouched. Such maps are also valuable in the location of new haulways and in the execution of other improvements. If the map is what it should be, no difficulty will be encountered in carrying out the plans successfully, but if it is not, the loss of time and money may be appalling.

Losses Owing to Incomplete Mine Plans

A poor map is often the result of the operator's idea that if a contracting engineer visits the mine only once or twice each year for a couple of days and makes a map that will pass the inspector he possesses something that supplies his needs. The requirements of the present have been met, and the average cost per ton of coal for the year has been reduced by not having a regular force to look after the mapping of the mine.

But the future has been neglected. Such methods were pursued by a certain small company. They had a number of men to make extensions on their map about once each year, always making it plain that the least time spent at the plant the better. When, after the mine had been in operation for a number of years, a new short-cut haulway had to be installed, it was found that their map was not worth the paper it was printed on. New surveys had to be made and a new map plotted of the area through which the new slope was to go. The price of the new work was a loss, since an accurate map would have furnished the necessary information.

Another instance was that of a company operating a block of coal on a lease. The engineering department was looked upon as a luxury and maps as an extravagance. After the mine had been worked out and the pillars drawn, the owners claimed that they had not received enough royalty and filed suit for a large amount. Tipple weights had been misplaced, and the only document upon which a settlement could be made was the map, which because of the views of the operators had been poorly kept. It was not even an approximation.

The attorneys, not knowing the accuracy of the map, agreed to leave it to competent engineers to figure from the map the tonnage obtained. This was done, with the result that the operating company paid out thousands of dollars in royalty for coal that was never mined owing to the existence of unfavorable conditions, but which was shown as extracted by a mere sketch that bore the dignified title of "mine map."

Blocks of coal have been left because there was no available information as to how to recover them. Money has been spent looking for pillars that have been drawn, but are shown to be in place. And instances of mines being drowned out by cutting into old workings not recorded or shown at a safe distance are familiar to all.

Keeping in mind the old adage that "anything that is worth doing at all is worth doing well," the engineer should take pride in making his maps accurate. It is the practice of too many engineers to go into the mines with but one idea in view—that of getting out as quickly as possible. Their haste causes the oversight of important details that ought to be recorded. They forget that their time is not their own, but is the property of the company which retains them. They run accurate transit lines in each heading, then offset their careful work by measuring rooms in a careless manner. Since by far the greater territory is worked by rooms, it is important that these be not only measured, but located carefully.

There is not an engineer who would go into a mine and be content with getting the bearing of each room and then plotting the bearings on his map. Still there are many who rush into the mine and are content with getting distances without bearings, never thinking that for the purpose of accurate work distances without bearings are as useless as bearings without distances. Bearings may be determined with the magnetic compass, but the results are always more or less unsatisfactory owing to the presence of attracting forces that cause the needle to vary. There is still a better method.

Some Suggestions

That method is to first decide upon a plan for working a mine or for working each section of a mine if such is necessary. Then have everything driven on centers according to the accepted plan. All rooms should be measured carefully shortly after they have been worked out. Offsets should be taken to the ribs at regular intervals, and also where irregularities in the working places demand them. If a place is stopped before it has been driven to its working limit, it is a good plan to note on the map the reason for stopping it. Then in the future anyone who examines the map may understand immediately why each block of coal was not taken out in the order of its development.

Where the mines are in a seam of varying thickness it is a good plan to note the thickness of the seam at regular intervals. Every bit of information that can be placed on a map will become more valuable as time passes, and the map will be more useful to those whose capital has purchased it. Service should be the watchword of every engineer. It is a good plan to take the map and a scale and check the tipple weights for a year, by finding the volume extracted and multiplying this amount by the weight of the coal per cubic foot. If the map is correct, it should check the output over the selected time within a small percentage.

In conclusion, let it be said that the mine map should be kept with all the care of a set of books, and each mark on a map, like each figure in a trial balance, should be correct and should have a definite meaning. The engineer should devote as much of his time to making a good map as to executing a piece of construction that is to serve the company for years to come.

Let there be more good maps and less sketches, for the difference in the cost of a good map and a sketch is small, while the difference in value between the two may amount to thousands of dollars. Let the small operator realize that a map is more than a parchment exacted by a tyranical legislature—it is something of tangible value, worth dollars and cents, to be prepared carefully, kept safely and consulted frequently.

Modern Mine-Plant Design--I

By M. L. Hyde*

SYNOPSIS—The most advantageous arrangement of surface works at a coal mine is a perplexing problem. This article, which is the first of two on this subject, advocates an arrangement of buildings which has many obvious advantages, but which is a decided departure from American practice.

These articles are addressed to the official who is facing the problem of designing, constructing and operating a modern mining plant—a plant to meet not only the exacting demands of today, but one with an elasticity that will allow of its conquering any phase of future market requirements.

A reasonable first cost, combined with the lowest operating and maintenance expenses, ease of extension, safety and sightliness, are to be secured; and in this day of radical improvements, it is indeed hard to feel that the accepted designs will prove efficient 20 years hence.

The line between good and bad design is a clearly marked one to the specialist, with fortunately a wide choice of properly designed and fabricated equipment, but with little margin so far as correct arrangement of units or assembly of elements is concerned.

Where equipment is to be purchased, it is often the custom to call in several manufacturers with the request that they furnish competitive designs and tenders. From these the best points are culled and a final design offered for bids. Such a proceeding is most unfair to the original bidders, is not good business and usually defeats its own purpose. Specifications while seeming to cover all points of each item as desired may yet prove far from satisfactory. As a rule it is safe to assume that any marked difference in first cost will be compensated by poorer workmanship, materials and details and will in the end prove an expensive bargain. Consultation with a specialist would have avoided such a result.

It is intended here to cover only the general features of plant design, but so far as possible all items of equipment will be specified to be of a given make or its equal. This is with no thought of influencing the purchaser, but merely that a standard of the highest type may be set.

In the layout described, a capacity of from 1,000 to 3,000 tons per day has been taken as covering the average mine output. The location of each unit represents careful study, and each has been set relative to its importance in the daily operative routine; for a mine is an organization of absolute routine, governed from beginning to end of shift by fixed laws, which must be observed in every detail. Men, coal and supplies are daily handled over specified courses, and in this process success calls for minimums in distances and in energy expended. Not only must the routine of operation be solved, but that of idleness as well, be the cause of such idleness lack of market, fire, strikes, accidents, or what it may.

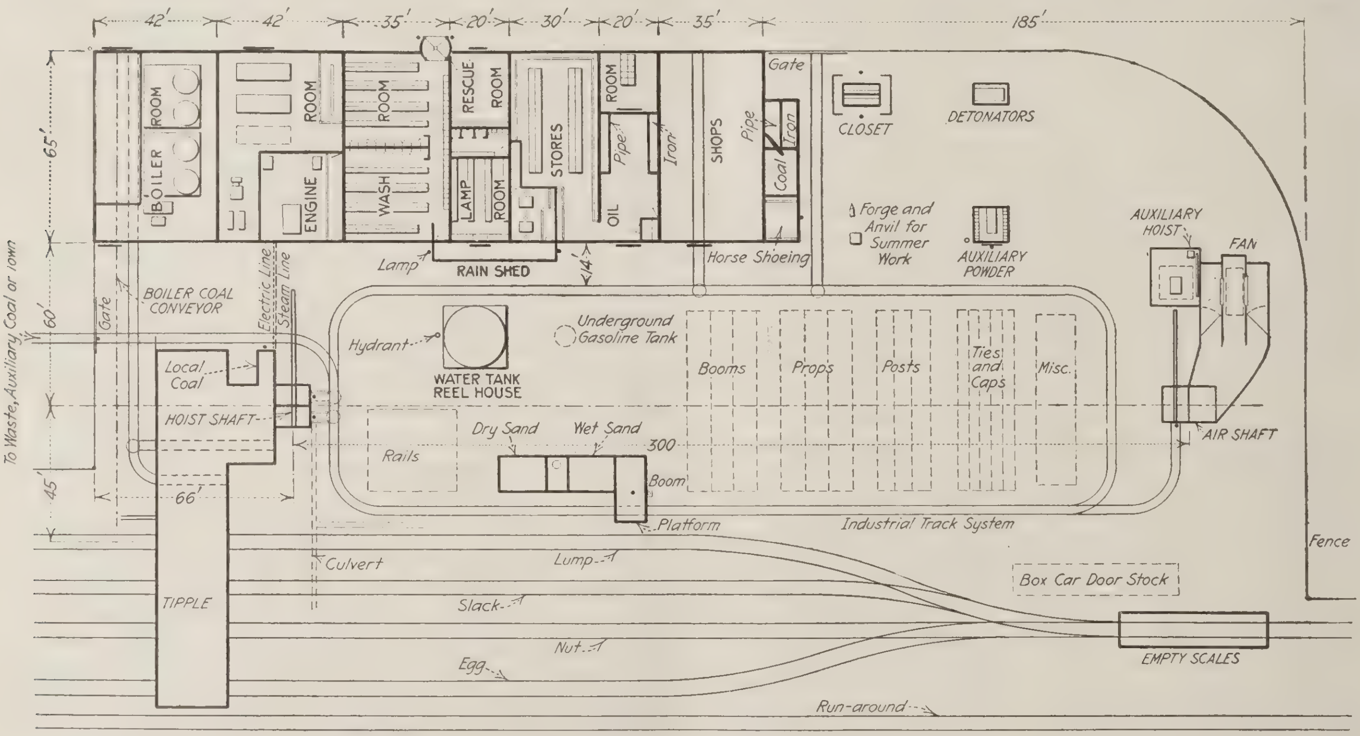

FIG. 1. GENERAL ARRANGEMENT OF MINE BUILDINGS

Concentration of Units Is Advantageous

Concentration is the golden rule to be followed in the general layout. Short distances allow of easier fire protection, inspection, upkeep and moving of men and supplies than can be realized from a haphazard, sprawled-out design.

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*Pembina Coal Co., Evansburgh, Alta.

A rectangular yard with a central lane dividing it the long way meets nicely the conditions imposed. Lights and hydrants on this lane facilitate the watchman's duty, allow of lighting the entire plant at a minimum cost and force all travel over one course. A stout wire fence, 8 ft. in height, should surround the yard, with lights placed at each corner.

Two industrial track systems are required—an inside one for handling damaged cars, machines, locomotives, general supplies, etc., and an outside system for handling coal to the houses, ashes from the boilers, waste from the tipple or houses, powder from the magazine and for delivering store supplies. A boy with a gasoline locomotive on these systems displaces from one to two teams, with a corresponding saving.

The determining factor of a satisfactory layout is the handling of men, coal and supplies. All employees should enter the works through the washroom, where they change clothes, proceeding thence to the lamproom for lamp and check, to the overman's office for instructions, to the auxiliary powder magazine for powder canister, to the shop for sharpened tools, and finally to the mine, after hanging their checks on the tally board. During this time they should not have had to step off the lane.

Coming from the mine, a man first removes his check from the tally board, deposits check and lamp at the lamproom and gives in his time at the office, his dull tools at the shop and his empty or partly empty powder canister at the magazine. He then goes direct to the washroom for bath and change and from the washroom to the outside. This avoids confusion and encourages promptitude and cleanliness on the part of the men, in the care both of their persons and of the company's property. With one or two waste barrels on the lane, the necessity of throwing fruit skins, burned-out carbide or cigar butts on the ground is eliminated.

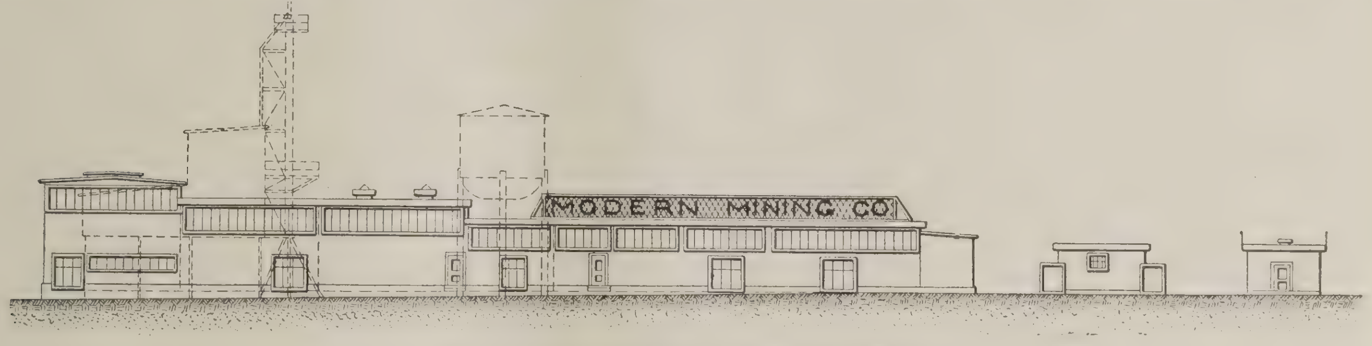

FIG. 2. SIDE VIEW OF MINE BUILDINGS

The outer door to the washroom should be open, and an attendant should be on duty at all hours. The inner door leading to the works must be locked during shutdowns and the key be placed in charge of the attendant. This man then sees every person attempting to enter the plant, and by having him appointed a deputy, perfect control is secured. Just off the central lane should be placed a water-closet for the use of men and officers.

The handling and preparation of coal for market has been covered in previous articles.

Power-plant coal for boiler or producer consumption should be taken by a cable conveyor direct to bunkers supplying these units.

Local or house coal should be discharged from the tipple direct to a car on the outside industrial track and thence be pulled by a locomotive to the house for which it is destined. Arrangements must also be made to allow of the tipple boss admitting and loading wagons for local supply. Whether cars or wagons are loaded, the bin should be so located that in getting their load these do not interfere in any way with the routine of the plant nor come in contact with any of the workmen.

Blacksmith and sand-drier coal should be unloaded first from the tipple to cars on the inside industrial tracks and thence transferred to bins.

Careful Arrangements Are Required

Supplies are generally purchased in much greater quantities than needed for immediate use and therefore require a minimum of two handlings—from car to storage and from storage to point of application. Here every facility should be afforded for economical work.

Rails are the heaviest commodity daily used, and their storage must be at such a point that they can be skidded from the car to stock and from stock lifted to the cage for lowering.

Next in importance are the mine timbers—ties, props, caps, etc. In storing these the element of fire hazard enters, and at least 100-ft. clearance between stocks and the hoist shaft is required. All timbers should be unloaded direct from cars to stock and thence to mine cars, with one handling in each case.

Moderately heavy supplies that are usually piled on top of one another—such as ropes, cement, lime, fireclay, roofing, etc., or bar iron and pipes which are stocked in racks—should be unloaded to a partitioned section of the storeroom, having overhead trolley service from the car to the warehouse interior. The same applies to barrels of oil, with the exception that a fireproof partition should separate the two stocks.

General supplies—such as paints, nails, waste, electric, mechanical and plumbing fittings, machine repairs, etc., that are carried in bins or on shelves—are handled from railroad cars to the inside industrial system and thence to the main storehouse.

Supplies that are seldom used—such as building lumber, heavy framing, brick, second-hand machinery, etc.—may be stored in one corner of the yard where they will not interfere with those more in demand and yet receive the benefit of industrial track service.

For unloading mine cars, machines, locomotives, heavy repairs, etc., a 12-ton mast and boom is required at the unloading platform. It should have sufficient swing to lift from the railroad car to the industrial track.

Sand for mine locomotives, if received in a wet condition, must go from the car to the wet storage with one shoveling; thence it passes through the drier to the dry bin enjoying the industrial-track service.

Scrap iron from the shop and ashes from the forge and drier are sent to waste or storage piles over the shortest paths. Ashes from the power plant are pulled out in cars running in a tunnel below the boilers or producers to the common waste track serving the waste bins under the tipple. The lump-coal boxcar-loader runner operates, during lulls in coal loading, a three-drum electric hoist placed adjacent to his loader. One drum on this hoist pulls ash cars from the power plant, another handles all cars on the waste-pile trestle, and the third is used for railroad cars in the yard. By means of turntables, cars conveying ashes or garbage from the houses may be sent to the waste pile.

The main powder magazine is located at the end of the waste yard, with industrial service for filling or emptying.

Carefully laid-out grades, ample drainage, 80-lb. steel with creosoted ties on 24-in. centers, heavy ballast, as few turns as possible against the locomotive pulling out trips of loads, switches coming together at given points, not over two switches to be thrown for spotting empties on any given grade track, and an average storage of four empties on each track under the tipple—all these are the essential features of a well-laid-out railroad yard. The ladder or scissors track layout at the tipple is not recommended.

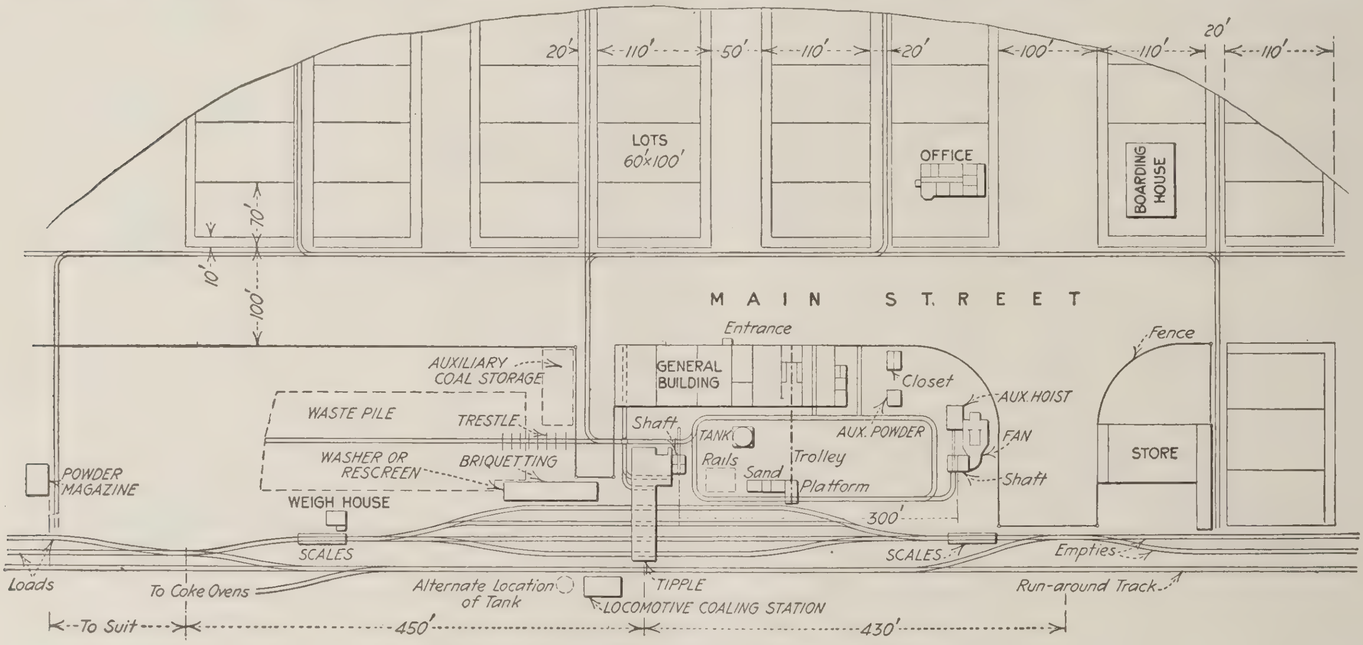

FIG. 3. ARRANGEMENT OF PLANT AND TOWN

The Store Should Be Served by Both Industrial and Railroad Tracks

The store, if run by the company, should be located adjacent to the empty storage yard for cars, enabling carload lots of merchandise to be handled direct. It should be accessible to men coming or going from work, be near to the main office and should enjoy service over the outside industrial track.

The mine office should overlook the plant, with the superintendent's room so placed that the entrance to the plant and the moving of cars may be seen from his desk.

Playgrounds, clubhouse, ballfields, etc., should be at the far end of the town, and every effort should be made to group the houses so that each employee has the shortest possible distance to traverse in his share of the daily routine. While winding boulevards enhance the beauty of a mining village, straight lines are just as pleasing and rent charges are materially in their favor.

The plant inclosure should be east and west, if possible, with the waste piles at the opposite end from the direction of prevailing winds. The townsite should extend either to the north or south.

All Building Units Should Be Under One Roof

Individual buildings housing individual units can no more compete with the low first cost and operating expense of the general departmental unit than can individual stores compete with the large department store.

Too much emphasis cannot be laid on this point: No operator should consider a layout in which, provided the ground surface is suitable, the boiler room, engine room, washroom, lamproom, rescue station, warehouse, overman's office, oilroom and shops are not under one roof; and, barring powder or detonator magazines, this applies to any other units required.

The first cost, space occupied, maintenance and operating expense are all less, while heating, ventilation, draining, lighting, plumbing, inspecting and protecting from fire or other damages are materially simplified.

For a long life, with low first cost and upkeep expense, pleasing lines and general desirability, a steel skeleton set on 8-in. concrete foundation walls, with flat roofs carried on beams, free of trusswork of all kinds, and covered, sided and partitioned with hy-rib and 2-in. cement plaster, is the solution. This construction requires no painting on the outside, is bright and cheerful on the inside, easily heated, cooled, cleaned or fumigated, is vermin-proof and fireproof, and in every way gives a combination ideally suited to the coal mine.

Foundation walls should be continuous and rise 12 in. above the highest grading on which the building is to stand, with a 6-in. vitrified tile drain placed outside of and along the base below the frost line.

Barrett specification roof laid direct on the plaster is recommended. The Sturtevant hot-blast system of heating and ventilating is of the simplest and most efficient variety. The hot-blast fan may be set on an elevated platform over the draft fan in the boiler room and driven from a secondary pulley keyed on the draft-fan engine shaft.

This system furnishes fresh warm air under perfect control, the apparatus is under the fireman's care and as the pipes carry only air at a low pressure, the risk from freezing, leaks, etc., resulting from steam or hot-water radiators is avoided. The washroom is particularly well served, owing to the uniform temperatures obtainable, the freedom from drafts and the continual replacing of the vitiated air with fresh, resulting in the quick drying of damp clothes.

The lighting should be of the best. Hinged sash placed just below the roof lines throws the light downward, with an even diffusion, the windows being so located that danger of breaking them is minimized. This arrangement, coupled with tungsten bulbs placed where needed, will meet both day and night demands.

Such units as the engine room, boiler room and washhouse, all of which require plumbing, should be placed adjacent to each other, while the shops should be so located that they are lighted from three sides. The building illustrated will house an equipment for a mine with a capacity up to 2,500 to 3,000 tons per day. For a larger tonnage the width may be increased. For unforeseen additions to the original capacity any or all rooms may be lengthened to suit.

To ascertain the size of plant necessary, a great many conditions must be studied. Among these are the average horsepower required by the shaft when hoisting; the number of mining machines to be used and the power required by each; the number of trolley locomotives, weight of trips, grades, etc.; the number of battery locomotives; the number of drills; the number of pumps and the capacity and lift of each; the power requirements of the fan, tipple, boxcar loaders, shops, deep-well pumps, power plant, coal conveyor, ash- and waste-handling systems, town lighting, etc.

THREE POWER SOURCES ARE AVAILABLE

The choice between steam, gas or a public power supply must be made. Strong claims are put forward by electrical engineers and others concerning the many advantages to be derived from purchasing current from a public supply as against manufacturing it at the mine. But before a public-supply contract is signed, the specialists in both gas and steam should be consulted and allowed an opportunity of showing the advantages of their respective powers.

Current is seldom sold at less than from ¾c. to 1c. per kw.-hr. It is invariably metered before passing to the motors, and because of the internal resistance of these machines, part of the current is absorbed in the machine itself. This gives a good motor about 85 per cent. actual efficiency and makes the cost 0.88c. to 1.17c. for each kw.-hr. available for useful work. This is the price that should be considered in any comparison made.

As competition grows stronger, economy in the use of the mine's product will grow greater. The market shows more and more a preference for the smaller grades of coal as new methods of burning them are developed. All this forces the conclusion that, to survive, the operator must install a system in which can be used either byproducts direct or such grades of coal as are unmarketable, preference being given to that arrangement which, other things being equal, can utilize either waste gases from the coke ovens or high-ash coal or bone from the picking tables.

The modern mine is in a position to maintain both day and night loads within fairly reasonable limits. During the day the tipple, fan and pumps offer a uniform load; and by running express trains on schedule, the trolley locomotives may be timed to minimize the peaks as far as possible. During the night the battery locomotives under charge, pumps, fan and lights are uniform, with the mining machines tending to create sudden fluctuations. As both trolley locomotives and mining machines do not have to be contended with on the same shift, but small difficulty should be encountered in handling such peaks as arise, be the power either steam or gas.

In making a comparison between steam and gas for mining work, the capacity of the plant is assumed to range from 400 to 1,000 kw. The gas equipment would then consist of the Smith Gas Power Co.'s updraft producers and cleaning apparatus and the Mather & Platt, Ltd., vertical double-acting valveless engines. A steam plant of the size assumed should embody the best type of water-tube boilers, fitted with superheaters and stokers, and steam turbines driving the electric generators.

COMPARATIVE EFFICIENCIES AND COSTS

In general the efficiency of a modern mine steam plant is somewhat less than that of a gas plant of the same size. A steam plant equipped as specified will cost slightly less than the gas plant, unless byproduct gas from the ovens may be used, doing away with producers, in which case the steam plant would be the more expensive.

Using the same coal- and ash-handling systems, operating costs will be approximately the same. One fireman on each shift can handle either four producers or four boilers, while one engineer can care for the engine room. In each case the gas attendant has the more pleasant job. Boilers require cleaning regularly; producers may go for two or three years without their fires being drawn. The valveless vertical engine gives no more trouble than the steam turbine, while the high-speed turbo-driven generator may be assumed to require more attention than the slow-speed engine-driven unit.

Oil and waste charges will be the same in either case. Depreciation should show in favor of the producer against the boiler and the turbine against the engine, balancing this item. Interest will also be the same. Coal and water costs will be in favor of gas.

Producers meet the requirements of the underwriters, and there is no more danger to be feared from them than from water-tube boilers; both require reasonable care.

There is no gas-storage tank, and the amount of gas contained in the pipes and coolers at any one time is not sufficient to cause a serious explosion, assuming an explosive mixture could get into the line and be ignited. If the water were shut off from the producer for one or two hours, no serious effect would be noticed other than the poorness in the quality of the gas.

A producer is nothing but a circular steel shell with firebrick lining. It has no tubes, is easier to fire than boilers, is much smaller and is more easily maintained.

The gas cleaning equipment of coolers, or condensers, tar and moisture extractors is made up of plain circular tanks, than which nothing could be simpler. The exhauster consists of motor-driven rotors in a heavy housing, smaller in size and just as simple as the draft fan for a steam plant. The piping carries a clean, cool gas at a low pressure, is relatively small, uncovered and requires no special valves or packing.

The turbine is undoubtedly the simplest prime mover obtainable, yet the gas engine designated is a close second in this respect. It has neither admission nor exhaust valves, cams nor gearing. The jackets are not cast on, and there is no danger from cylinder cracks.

Producers are guaranteed for 20 per cent. overload for two hours, and in many cases are run continuously at 50 to 75 per cent. overload. They cannot, however, carry the excessive overloads of 200 to 300 per cent. taken by the modern forced-draft boiler, owing to the high heats generated fusing the ash and requiring an increased amount of manual labor to break the clinker formed. Their range is sufficient, however, to meet the requirements of any well-regulated mine.

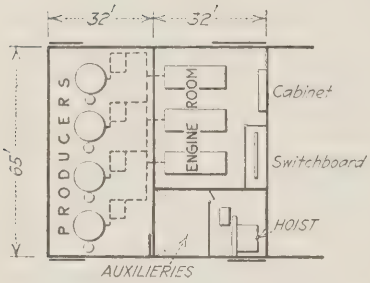

FIG. 4. PLAN OF GAS PLANT

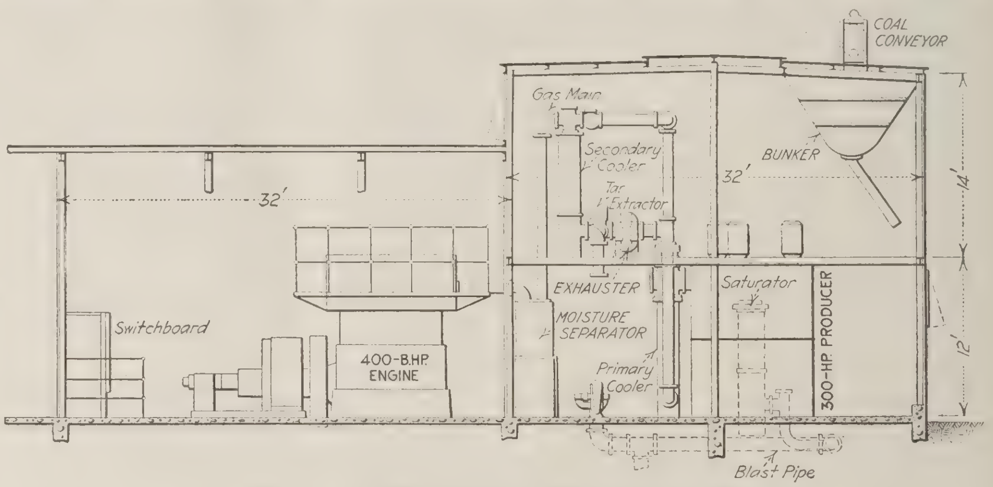

FIG. 5. CROSS-SECTION OF GAS PLANT

Standby Losses Are Less with the Gas Plant

When a producer is shut down the gas outlet to the atmosphere is opened, all inlets to the ashpit are closed, and 5 per cent. of the fuel used for rated load is required to keep the producer in shape for starting. This allows of keeping the fire reasonably hot and starting up in from 45 min. to 1 hr. Producers can stand for an indefinite period, provided coal is charged every 8 hr. to compensate the standby losses.

The lowest grades of lignite and the high-ash bituminous waste can both be gasified and a good efficiency realized. It may be said that, with the use of bone carrying from 25 to 30 per cent. ash, 1 hp. can be delivered from a producer with about the same quantity of fuel that a boiler would require of a good marketable grade.

In a plant such as described the ashes are withdrawn through low ash doors and shoveled to cars. No special system is necessary for the moderate sized plant. Assuming 1,200 hp. at 1½ lb. of poor coal with 15 per cent. ash per horsepower-hour, operating 16 hr. at full load and 8 hr. standby, 15 tons of coal will be used, giving 2½ tons of ashes, or from two to three cars only. The ashes would be withdrawn but once in 24 hr., just before starting up in the morning. When 5 to 10 tons of ashes per day must be handled, any labor-saving system suitable for boilers may be advantageously installed.

Two and one half gallons of water per pound of coal gasified is required for cooling the gas and 4 gal. per brake horsepower-hour for jacket cooling in the engines. One pound of water is required per horsepower-hour for saturating the air used in the producer; this is taken from the engine-cooling system. After passing from the cylinder jackets, the water passes through a heater placed in the engine exhaust line and thence to the saturator.

The total water required for 1 b.-hp. per hr. at 1½ lb. of coal is therefore 7¾ gal. This water can be used over and over again by providing cooling ponds, and the amount needed to make up the loss owing to evaporation would not exceed 3 per cent. of the whole. The water used does not require treatment, and a quality practically out of the question for boilers would be satisfactory.

While the gas-cooling water will gradually accumulate considerable quantities of tar; this does not affect its efficiency nor prohibit it from being used repeatedly if a cooling system is furnished, this system being separate from the one used for the jacket water. The cooling pond required is by no means as large for a given capacity as where exhaust steam from a turbine is to be condensed.

Byproduct Recovery May Be Profitable

Where the fuel consumption reaches a ton of coal per hour, or more, a recovery plant becomes profitable. From 10 to 12 gal. of tar per ton of coal used is recoverable, as well as from 70 to 80 lb. of ammonium sulphate. The latter sells the world over for between $65 and $70 per ton. It is employed as a fertilizer and is especially valuable for the cultivation of beets. No skilled attendant is required for the recovery plant, the receipts from which should go far toward counterbalancing the operating costs of the plant as a whole.

In estimating the amount of sulphuric acid used in the recovery of ammonium sulphate, 1.1 tons of acid per ton of sulphate will be required. The cost of this acid delivered at the plant may be ascertained at the nearest distributing center and will run from $10 to $17 per ton.

Not only is the width of both the producer and the gas-engine room less than that of the boiler and steam-engine room, but the height of the producer room is also materially less than that of the boiler room. The cubical contents of a building to house a steam plant will be about 50 per cent. larger than in the case of a gas plant.

To sum up: At no higher cost the gas plant may be installed in a smaller building; the same output will be realized with less coal to furnish and handle and less ashes to remove. Water may be used that is unfit for steam raising, and where a pond is installed, but a small amount of makeup will suffice to replace the losses due to evaporation. No stack is required, no special foundations, and there is no smoke. The reliability, safety and maintenance are favorable to gas as compared with steam. It would therefore seem that if the loads can be kept anywhere near uniform the gas plant appears an attractive proposition.

Extracts from a Superintendent's Diary

For some time we have felt pretty sure that a labor agent has been enticing our men away, but not until today have we been able to get any positive evidence. Early this morning John Towne, our camp deputy, came by the office and remarked that unless all signs failed he would have a labor agent in the toils before night.

Sure enough, about 2 o'clock he came in, leading a crestfallen-looking individual manacled to him.

John Towne's reputation is so well established in our community that he is never obliged to use force in making an arrest. To offer resistance to him is equivalent to courting a terrible beating, and people who are familiar with his habits are not willing to take chances. The man under arrest was evidently not acquainted with John's peculiarities, as one of his eyes was swollen nearly shut and blood was still flowing from a wound on his right cheek.

It is about impossible to convict a man for the crime of enticing away labor, but it is easy enough to arrest a suspect on some charge and thus get him out of the way temporarily. If the matter is handled cleverly, he will probably have no desire to return. That is the plan our deputy follows whenever he encounters labor agents.

John brought his prisoner into the office and sat him down in a corner in the rear to await the next train for our county seat. While waiting for the time to pass, he procured water and a towel and tried to make the man's face more presentable.

People passing through the office invariably stopped to stare at the stranger, but he seemed to pay no attention to them, nor for that matter to anything that was going on around him. His every action seemed to say: "I am in the hands of the enemy, and no one realizes it more than I do. But I'll be game to the last."

However, he didn't remain game to the last, neither did our deputy.

About an hour before train time my 3-year-old son came over to take a look at his "Daddy," as was his wont on occasions, and he immediately discovered the prisoner at the other end of the office.

He had to get close to him, but he looked him over from head to foot before he opened his mouth; then he started out with questions that demanded answers.

At first the stranger paid no attention to him, but that could not last long. When my boy inquired about his boy, he lost control of himself. "Little boy," he said, "I haven't seen my kids in months, and the good Lord alone knows when I will see them again. I can't hear from their mother because I can't let her know where I am, except when I am in jail, and then I don't want to let her know my whereabouts."

Somehow up to that time it had never occurred to any of the audience that this man was just a human being, but his remarks seemed to change everyone's line of thought.

John Towne was the first to put his thoughts into words. "Say, man," he said, "why in the name of Sam Hill didn't you tell us that you were trying to make a living for a wife and kids?"

As I was leaving the office tonight I noticed John and the stranger walking down the street together, arm in arm, and they were going in the direction of John's home.

They were no longer bound together by manacles, but were bound together nevertheless

French Coal Output in 1914

French coal production in 1914, says *Commerce Reports,* amounted to 29,786,505 metric tons, compared with 40,843,618 tons in 1913. The coal output for the first half of 1914 amounted to more than half of the total production for the year 1913. The detailed figures for the coal-mining regions of France are as follows for 1913 and 1914:

Coal Basins	1913. Tons	1914, Tons
Nord and Pas-de-Calais	27,389,307	17,800,308
Loire and Haute-Loire	3,966,618	3,487,644
Gard and Herault	2,332,091	2,045,378
Tarn and Aveyron	1,974,804	1,810,466
Isere	362,662	317,351
Saone-et-Loire	2,210,091	2,048,200
Bouches-du-Rhone	694,054	619,313
All other	1,913,991	1,657,845
Total	40,843.618	29,786,505

In 1914 France imported from Great Britain 10,759,058 tons of coal, 18,883 tons of coke and 116,549 tons of manufactured fuel (*agglomérés*).

Loyalty via Appreciation

Yes, I work for a man, or rather a corporation, an institution. And I work, as a cog in a great machine—to be sure a small cog, a cog that can easily be renewed by another; but nevertheless while I'm there I help to keep the machine going. Of course the corporation pays me wages that supply my bread and butter—lubrication so to speak, to keep me working smoothly as I do my share to grind out the golden dollars to swell its coffers.

And I do not vilify, I do not condemn, and I do not eternally disparage. I am part of the order of things as they are. But one word I would say:

You man, you institution, who would have the loyalty of your employees, why don't you speak well of them? A pat on the back, a little word of encouragement, a look of appreciation will bind your men to you with threads of loyalty far stronger than chains of tempered steel—a bondage that will not be broken by the lure of higher wages or shorter hours.

An ounce of appreciation is worth a ton—aye, a hundred tons—of browbeating an employee.—Baltimore & Ohio R.R. Co. Employee Magazine.

Accident Prevention During Construction Work*

Probably no other class of work is so productive of accidents as the construction of industrial plants. This is due, primarily, to the fact that the conditions under which the work is done are constantly changing, and that it is generally impracticable to make the working places as safe as they would be made under more stable conditions. Another matter that has a great effect upon the number of accidents is the fact that most construction work is a "rush" job. Foremen and men get out to break records and are keyed up to work at the highest rate of speed, so that the taking of a chance that might cause an accident becomes a matter of comparatively slight importance to them.

Improperly built scaffolding is one of the most important causes of such accidents. Scaffolds are frequently built of any sort of lumber that is quickly available for the purpose, whereas only first-class material that is free from knots should be used.

The proper design of such erections is just as important as that of permanent structures, but in general anything from a single board up that will meet the need of the immediate moment is considered sufficient. Accidents are on record that were caused by a number of ironworkers, who had with them heavy tools and equipment, attempting to use a single-plank staging that had been built for the use of one man who had no heavy tools with him. Scaffolds that are raised 10 ft. or more above the ground should be provided with toe boards to prevent accidents caused by falling tools, and when light swinging scaffolds, such as used by painters, are employed, all tools and materials should be removed from the scaffold when it is not in use.

Keep All the Working Floors Clean

Working floors should be kept as clean as possible, and all permanent openings should be closed in with planking fixed in place, as workmen who may happen to need a plank for any purpose are not particular where they get it and are likely to take any plank that may have been used to cover such an opening if it is not secured in place. These floors should also be made as tight as possible in order to prevent tools and material falling through onto men below. In many cases planks are left so that a man stepping on one end may tip the plank up, and the falls that have been caused by these "traps" are almost innumerable. Those responsible should be disciplined.

Where hoists are used for raising material, the landings should be properly guarded. We have on record an accident that was caused by a man walking under the cage as it was being lowered, no barrier having been provided to prevent him doing so. It is best to close in the sides of the cage or shaft with a solid sheathing, as tools may project and be caught in the framing.

Construction men frequently find electrical wiring that interferes with their work and sometimes handle and move it without proper authority or knowledge of what they are doing. In one case an ironworker held an iron bar against a high-tension wire to find out whether or not it was "live." Fortunately for him, it was not; otherwise he would never have known the difference.

Ironworkers engaged in the erection of steel framing have a particularly hazardous class of work to perform, but in a desire to "show off" some men take chances that are entirely unnecessary. In connection with this work it is also important that the rope slings and tackle that are used should be of the best quality and in good condition. Pieces of rope and cable that have been badly strained and are unsafe for further use are laid aside for the moment until they can be destroyed. Then some man who needs a rope for some purpose comes along and takes such a piece because it happens to be the first thing he sees. He has no knowledge of the condition it is in, and the result is an accident.

When material is being raised and lowered, care should always be taken to keep men away from underneath. A cylindrical tank that was being lowered slipped from the tackle and fell on a man who was working below and caused a serious injury. Many accidents would be prevented if the work were done so that one gang would not have to work below another, and such arrangements should be made whenever possible.

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*From "The Anode," published by the Anaconda Copper Mining Co., Butte, Mont.

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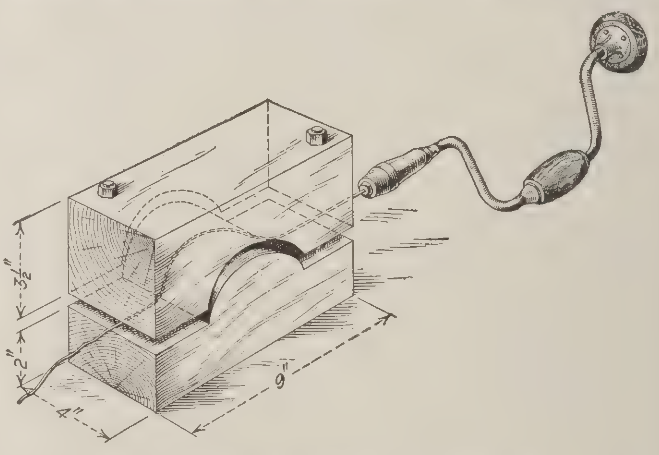
Handy Wire Straightener

By W. C. Eyl*

One is sometimes confronted with the apparently hopeless task of straightening an old, crooked, kinked wire. To many this is no easy job, but to those who become familiar with the straightener here described the problem will be a comparatively simple one.

To make this straightener first procure two blocks of hard wood, each about 3½x4x9 in. Cut the two ends of one piece down from 3½ in. to 2 in. in thickness for a distance of 2½ in. from either end. This will leave a rectangular projection in the center of the piece. Round the two ends of this projection off as shown in the accompanying illustration. Now from the other block and on a 4x9-in. face cut out a concave depression to fit over the curved surface of the other block. Now, placing the two blocks together, bore two holes, one in either end and in opposite corners, as shown in the diagram.



WIRE STRAIGHTENER IN OPERATION

By means of two bolts clamp the two blocks onto the wire to be straightened, near one end. Fastening a brace or something similar to the short end, turn the wire, drawing it through the block at the same time. The result will be a straight wire. This device will straighten a wire of any diameter.

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*University of Kentucky, Lexington, Ky.

Insuring the Coal Supply

By Henry J. Edsall*

SYNOPSIS—The storage of coal is insurance against either excessive fuel prices or a shutdown. Certain precautions must be observed in stocking bituminous coal, and the means to be employed will vary widely with circumstances, each installation being a separate problem. Many varieties of stocking and reclaiming apparatus are here described.

While it has become almost universal practice among business men to carry insurance against fire, accidents to employees and other possible happenings beyond their definite control, the carrying of an ample coal supply as an insurance against delays or a possible closing down of the plant is apt to be neglected by the coal consumer. The advisability of this kind of insurance is not hammered at him by the insurance man as are the other kinds, and he is apt to have a feeling that he can always get coal somehow, even though there is a shortage.

Every once in a while, however, there is a strike of the coal miners, congested conditions on the railroads, an unusually severe snowstorm, an especially heavy demand for coal, along with a business boom and a car shortage, or something else happens to disturb the equilibrium between the available coal supply and the demand. At such times the prices soar, and the man with a good-sized coal pile pats himself on the back for his foresight, while the one who neglected this precaution is bidding against other consumers, in the same predicament, for enough coal to keep his plant running and to avoid an interruption to business at just the time when business is booming and any delay would be disastrous.

The consumer with ample storage facilities is also in a position to take advantage of special prices which may be offered him at certain seasons of the year or of a special offer of some dealer because of a combination of circumstances affecting him. Better coal can also be obtained at certain times, and the main supply can be laid in under favorable weather conditions instead of having to handle coal all through the winter, with its snow and sleet storms and zero weather.

Where small anthracite steam coal is used, the storage problem is comparatively simple, since the small size makes it easy to handle by machinery, and it can be piled to any depth without danger of spontaneous combustion. Since, however, the majority of the coal used for steam purposes is bituminous, it is this kind as a rule for which storage facilities have to be provided.

Bureau of Mines' Investigations

The United States Bureau of Mines has made some investigations of the deterioration and spontaneous heating of coal in storage and expects to carry on further experiments and publish further data later on. Technical paper No. 16, published in 1912, gives points of information obtained from individuals who have had experience in storing coal under various conditions. It also gives results of tests made by storing different kinds of coal, both exposed to the weather and submerged under fresh and salt water in different localities. The following quotations are from this paper:

> The results show in the case of the New River coal a loss of less than 1 per cent. of calorific value in one year by weathering in the open. In two years the greatest loss was at Key West, 1.85 per cent. There was practically no loss at all in the submerged samples in one year, fresh or salt water serving equally well to "preserve the virtues" of the coal. There was almost no slacking of lumps in the run-of-mine samples. In all tests the crushed coal deteriorated more rapidly than the run-of-mine.
>
> The Pocahontas run-of-mine coal in a 120-ton pile on the Isthmus of Panama lost during one year's outdoor weathering less than 0.4 per cent. of its heating value and showed little slacking of lumps.
>
> Gas coal during one year's outdoor exposure suffered practically no loss of calorific value, measurable by the calorimetric method used, not even in the coal forming the top 6-in. layer in the bins.
>
> Submerged storage is an absolute preventive of spontaneous combustion, and on that account alone it may be justified when the coal is particularly dangerous to store and when large quantities are to be stored; but unless the storage period is to be longer than one year, there seems to be no ground for storing any coal under water merely for the sake of the saving in calorific value to be obtained by the avoidance of weathering.
>
> Losses of value from spontaneous heating are a much more serious matter than the deterioration of coal at ordinary temperatures. Oxidation proceeds more rapidly as the temperature rises. The oxidation, beginning at ordinary temperatures, attacking the surfaces of particles and developing heat is probably in some degree an absorption of oxygen by the unsaturated chemical compounds in the coal substance. In a small pile of coal this slowly developed heat can be readily dissipated by convection and radiation, and very little rise in temperature results. If the dissipation of the heat is restricted, however, as in a large pile densely packed, the temperature within the pile rises continuously. The rate of oxidation of the coal platted against the temperature makes a curve that rises with great rapidity. When the storage conditions are such as to allow warming of the coal to a temperature of about 100 deg. C., the rate of oxidation becomes so great that the heat developed in a given time ordinarily exceeds the heat dissipated, and the temperature rises until, if the air supply is adequate, the coal takes fire. Evidently, therefore, it is important to guard against even moderate heating of the coal, either spontaneous or from an external source. Increased loss of volatile matter and of heating value occurs with a moderate rise of temperature, even though the ignition point is not reached.
>
> Spontaneous combustion is brought about by slow oxidation in an air supply sufficient to support oxidation, but insufficient to carry away all the heat formed. The area of surface exposed to oxidation by a given mass of any one coal determines largely the amount of oxidation that takes place in the mass; it depends on the size of the particles and increases rapidly as the fineness approaches that of dust. Dust is therefore dangerous, particularly if it is mixed with lump coal of such a size that the interstices permit the flow of a moderate amount of air to the interior. Coal differs widely in friability; that is, in the proportion of dust that is produced under like conditions. In comparative tests samples of Pocahontas, New River and Cambria County (Pennsylvania) coals produced nearly twice as much dust (coal through a ⅛-in. screen) as coal mined from the Pittsburgh bed in Allegheny County, Pennsylvania. This variation in friability is a factor in affecting the liability to spontaneous heating.
>
> Ideal conditions for such heating are offered by a mixture of lump and fine coal, such as run-of-mine with a large percentage of dust, piled so that a small supply of air is admitted to the interior of the pile.
>
> High volatile matter does not of itself increase the liability of coal to spontaneous heating. A letter of inquiry sent by the bureau to more than 2,000 large coal consumers in the United States brought 1,200 replies. Of the replies 260 reported instances of spontaneous combustion, and 220 of the 260 gave the name of the coal. The 220 instances were distributed as follows: 95 were in semibituminous low-volatile coals of the Appalachian region, 70 in higher-volatile coals

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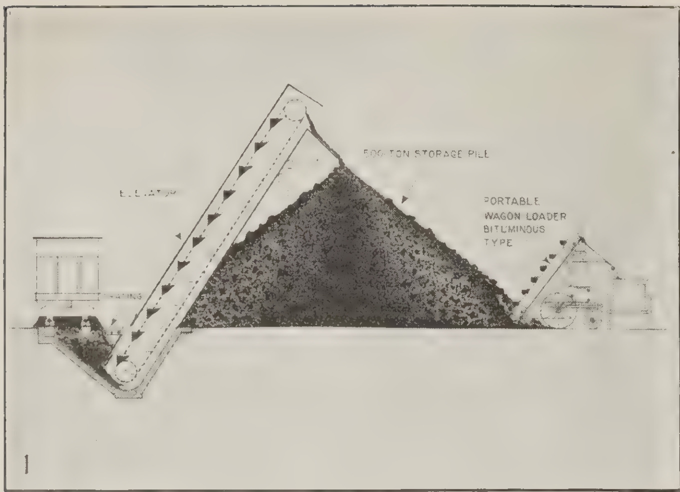
*Philadelphia, Penn.


ELEVATOR
500-TON STORAGE PILE
PORTABLE
WAGON LOADER
BITUMINOUS
TYPE

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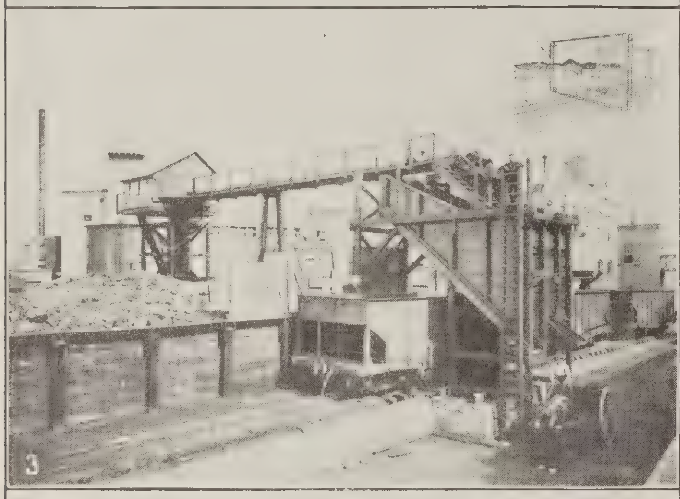

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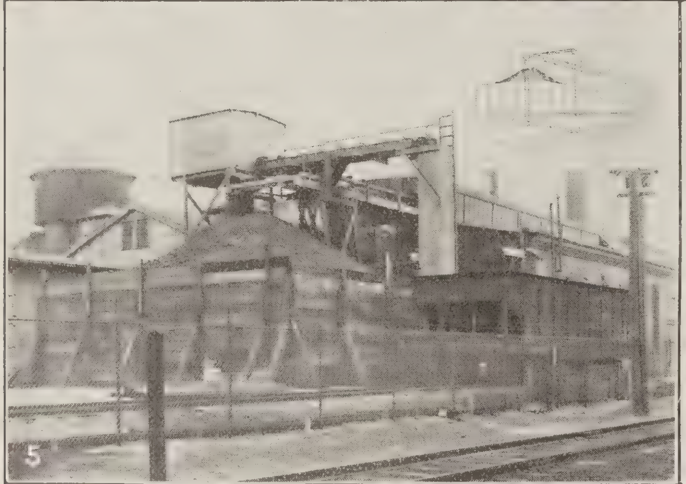

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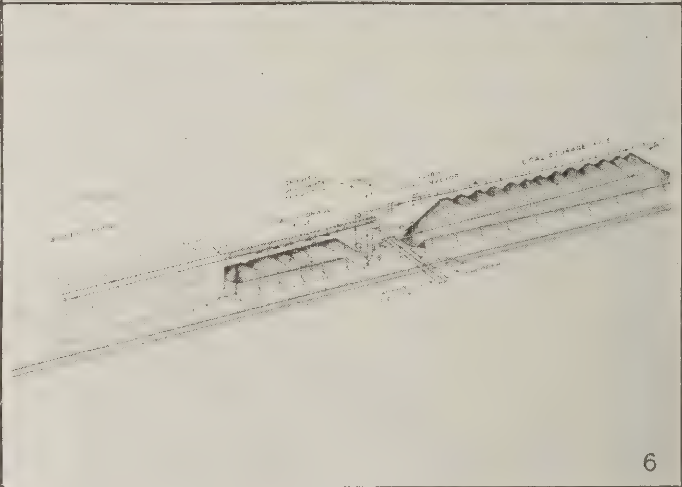
COAL STORAGE PILE

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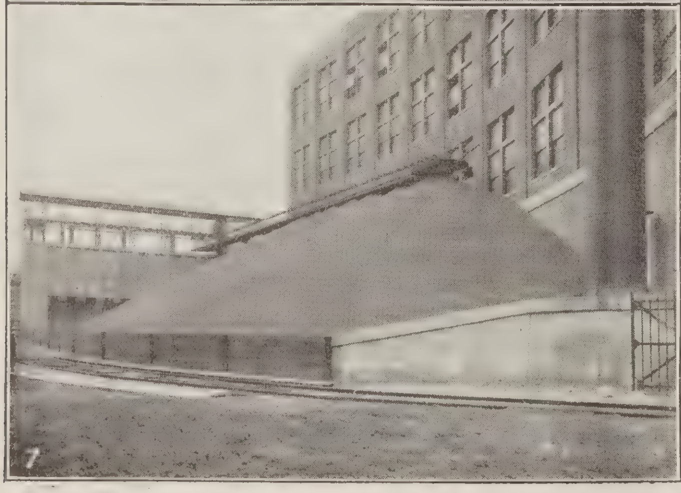

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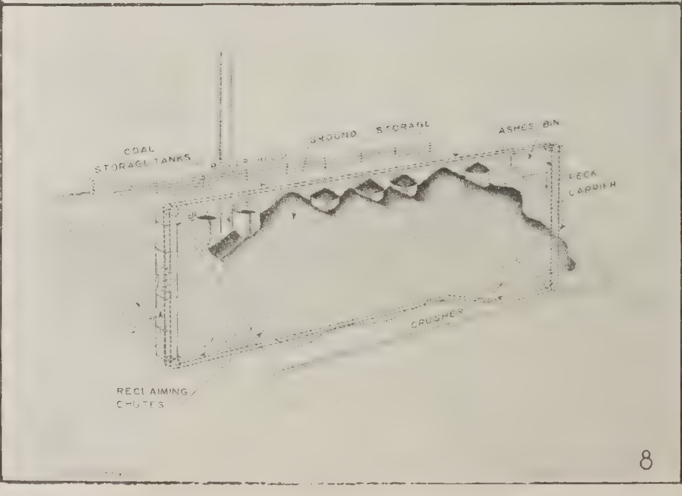
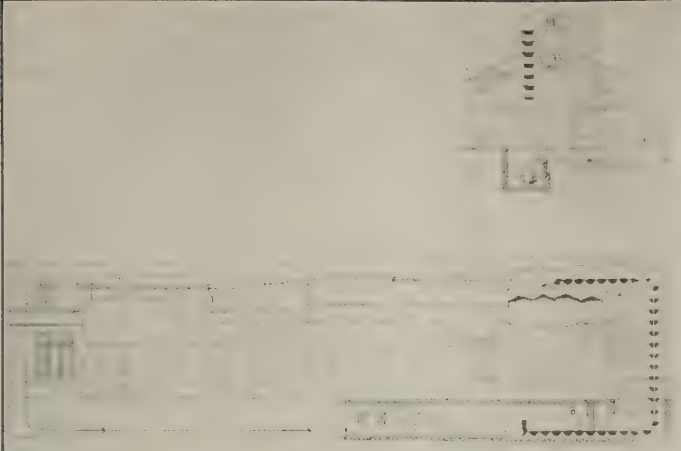

COAL
STORAGE TANKS
BOILER ROOM
GROUND STORAGE
ASHES BIN
PECK
CARRIER
CRUSHER
RECLAIMING
CHUTES

8



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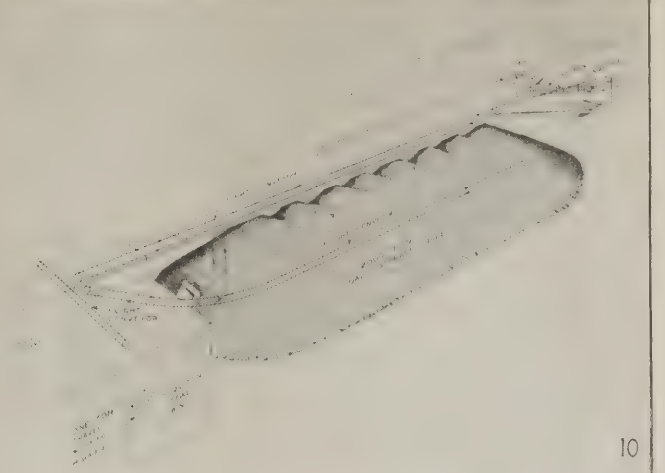

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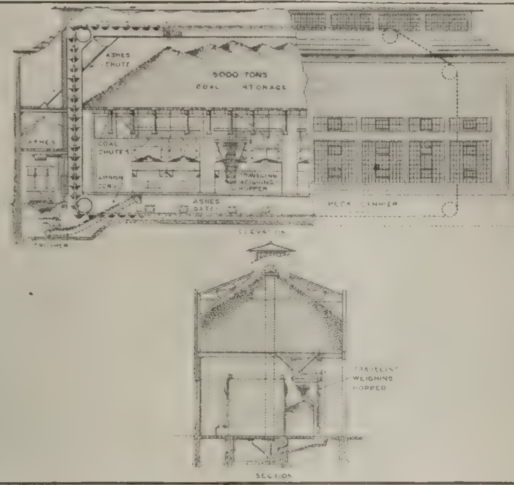

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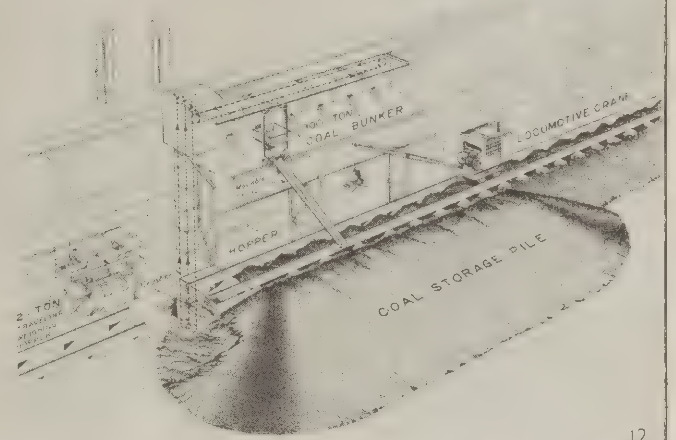

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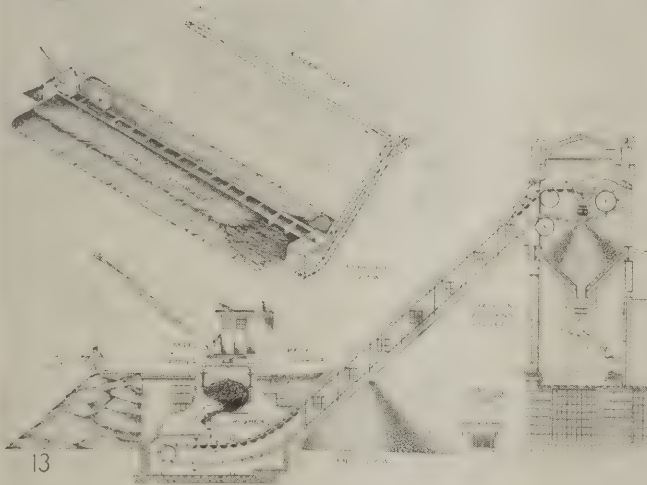

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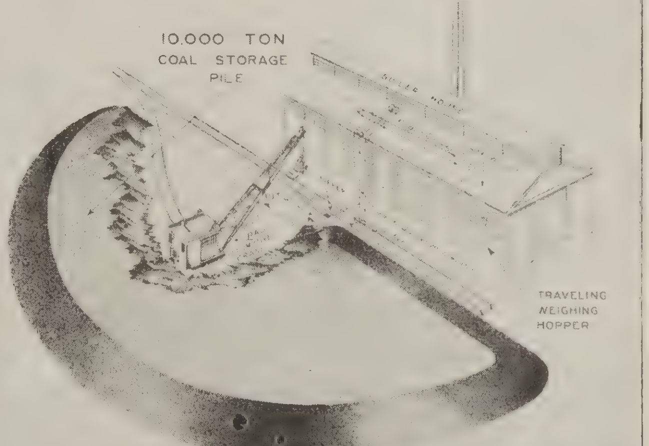

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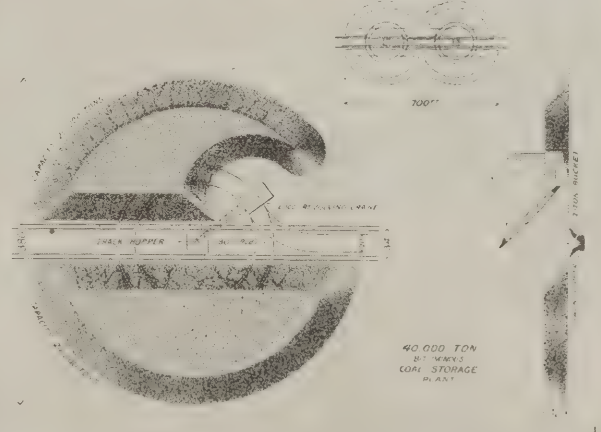

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of the same region and 55 in western and middle-western coals.

Freshly mined coal and the fresh surfaces exposed by crushing lumps exhibit a remarkable avidity for oxygen, but after a time the surfaces become coated with oxidized material, "seasoned" as it were, so that the action of the air becomes much less vigorous. In practice, coal that has been stored for six weeks or two months and has even become already somewhat heated, if rehandled and thoroughly cooled by the air, seldom heats spontaneously again.

OVERHEAD STORAGE USED WITH MECHANICAL STOKERS

Where mechanical stokers are used, it is almost universal practice to provide an overhead storage bin for at least part of the coal supply, this bin being located either right in the boiler room or at a convenient point close by. This coal is either spouted direct to the stoker magazines or drawn from the bin into a traveling larry or weighing hopper running on an overhead track above the stokers, the coal being delivered from the larry to the magazines.

Where the firing is done by hand, the coal is shoveled from the floor or from a charging car, so that the overhead bin does not show such a decided advantage over a ground-storage bin. The overhead bin is often used, however, for the sake of neatness and on account of the possibility of arranging it so that the greater amount of the coal can be spouted by gravity to convenient points within easy reach of the fireman without having to keep a lot of coal on the boiler-room floor or constantly bringing it in from the outside.

Without the overhead bin it is customary either to pile the coal against the outside of the boiler-room wall, in front of the boilers, and leave openings in the wall so that it will flow through onto the floor within easy reach of the fireman, or to pile it at as convenient a point as possible for transfer to the boiler room.

On account of the expense of construction the amount of overhead storage is usually kept down to what is considered a minimum for satisfactory operation, and some cheaper type of storage is arranged for the reserve supply, with a means of transfer from the reserve storage to the active storage.

The justifiable amount of investment for reserve storage and transfer facilities depends on the size of the storage that is considered advisable, on the amount of coal which will be delivered to the storage and transferred from it in a certain time and on local conditions. In some cases coal is as a rule received regularly, and the reserve supply is simply an insurance against unusual contingencies, to be called on only at infrequent intervals. In such cases it may pay better to use hand labor partly or entirely for the storage and transference rather than to invest much money to eliminate this hand labor when it does not figure as a large yearly expense. In other cases the coal supply may be so irregular that it is necessary to call on the reserve storage at frequent intervals, and the amount of hand labor which it is possible to eliminate justifies quite a large investment.

RUN-OF-MINE COAL IS USUALLY CRUSHED

If the coal is received as run-of-mine and is to be used in mechanical stokers, it is usually passed through a crusher before it is delivered to the stokers. At small plants it is sometimes passed through a grating over a feeding hopper or the large lumps are broken up in some other way, instead of the expense being incurred of installing a crusher with its driving arrangement. Where the coal is to be fired by hand the crushing is not considered necessary as a rule; but if it is to be handled by machinery, it must be crushed or the machinery must be made capable of handling the largest lumps.

When a crusher is used it can be placed at the receiving point, so that the coal is passed through it as soon as it is unloaded and before storing. On the other hand, if a reserve storage is employed, the coal may be stocked as run-of-mine and passed through a crusher just before it goes into the active storage for the boiler room.

This means collecting from the reserve storage and bringing all coal to the fixed point where the crusher is located, unless this machine is made to move along on wheels, as is sometimes done. Where the coal is handled entirely by conveyors, it simplifies the problem to crush it first, so that it is easier to handle, though this necessitates the storing of crushed coal in the reserve supply as well as in the active storage.

THE RESERVE STORAGE MAY BE RUN-OF-MINE

Where a grab-bucket arrangement is used for the reserve supply, it is usually just as easy and sometimes easier to make this a run-of-mine storage and crush the coal just before it goes into the supply for the boiler room. Since the coal mines are fast becoming equipped with screening and picking arrangements for sizing and preparing the coal, it is now entirely feasible to buy coal of the size required for use, though the sized coal costs a little more than the run-of-mine.

In considering the different types of reserve-storage plants, the simplest case is undoubtedly that where a moderate amount is unloaded from railroad cars and piled on the adjacent ground without any provision for reclaiming mechanically. The most economical machine for this work is a chain-and-bucket elevator or an inclined scraper conveyor, technically known as a flight conveyor. A pit is built under the railroad track at the unloading point so that the coal can be discharged from hopper-bottomed cars into the pit and fed through a gate to the elevator or conveyor. With the elevator the buckets pick the coal up, elevate it and discharge it at the head to a chute to the pile. With the inclined conveyor the flights scrape the coal up in a steel trough and discharge it in a similar manner at the head.

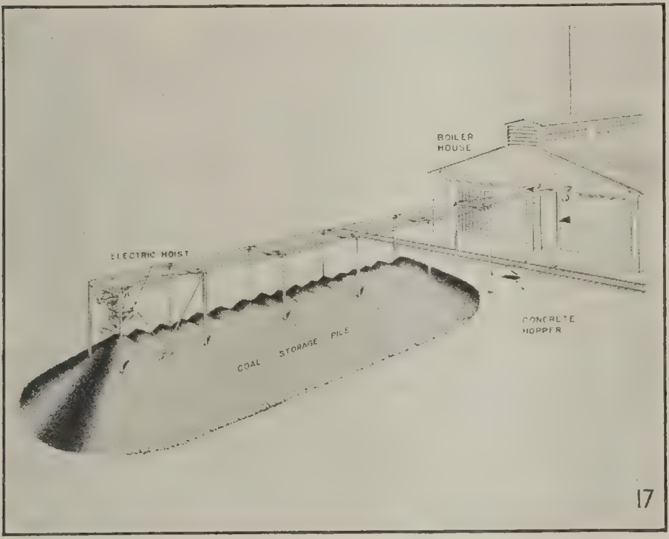
The coal can be handled as run-of-mine or a grating can be placed over the track hopper and the larger lumps broken on it, thereby making it possible to use a somewhat smaller and cheaper equipment. For a pile of 500 or 600 tons, the machinery, including a motor for driving, can be purchased for about $600; and in addition to this there will be the cost of the pit and machinery supports, also the cost of installing the equipment. Machines of this kind usually handle coal at the rate of about 30 or 40 tons per hr., providing the coal can be unloaded from the cars at this rate. This depends on the type of railroad car, the percentage of lumps in the coal and the number of men used to unload the cars.

Where a cart is available for hauling the coal to the boiler room or where it can be transferred by small industrial cars, a portable wagon loader is an excellent way to pick it up from the ground. A standard machine of this type will handle anthracite or run-of-mine bituminous coal at the rate of a ton a minute. They are built both hand- and power-propelled, the hand-propelled machines costing about $550 and the power-propelled ones $850, complete with electric motor or gasoline engine for operation.

Fig. 1 shows a bucket elevator delivering to a ground-storage pile and a portable wagon loader handling the coal from this storage to carts. Fig. 2 shows an inclined flight conveyor handling coal from the railroad cars to a ground-storage pile, the pile in this case being adjacent to the boiler room so that part of the coal flows through openings in the boiler-room wall to the floor directly in front of the boilers.

A Conveyor May Both Store and Reclaim Coal

By going a step further and adding a reclaiming feature, a conveyor can be made to deliver the coal to the storage, also take it from the storage and deliver it at a desired point. For this work a gravity-discharge type of machine is often used because it will both elevate the coal and convey it along horizontally or at an incline, and by bringing the buckets back in a tunnel underneath the pile, the same machine can be used as a reclaiming conveyor. These machines have V-shaped buckets carried between two chains and properly attached to them. When elevating, the coal is carried up in the buckets. When it is being conveyed, the buckets act like the flights of a flight conveyor and push it along in a steel trough, through which it can be discharged at the desired points by means of gates.



THE CLAMSHELL BUCKET AND MONORAIL STORAGE

Fig. 3 shows an arrangement like this for handling coal from railroad cars and delivering either to a small overhead bin or to a ground-storage pile, also taking from the pile and delivering to the bin. The conveyor encircles the bin and pile, the lower run being located in a tunnel underneath the pile. When the stored coal is wanted, it is fed through gates to the lower run of the machine and taken up to the pocket. In this case there are three boiler rooms in the plant, and the coal is loaded into carts and delivered to the boiler rooms in this way.

A Combination Is Often Employed

Frequently in piling coal a combination of bucket elevator and flight conveyor is used, the elevator taking the coal up to the proper height and the flight conveyor distributing it along in a pile of any desired length that is not excessive for a conveyor. A combination of this kind is shown in Fig. 4. The maximum depth of the coal is about 18 ft., and the length of the conveyor is 200 ft.

Without resorting to hand-trimming of the coal—that is, simply allowing it to take its natural slope as it is discharged from the conveyor—it is possible to store about 3,000 tons of anthracite coal or 2,000 tons of bituminous, the difference being due to the difference in the natural slope of the two kinds of coal. This sort of an arrangement is quite similar to a railroad-trestle storage, but is much cheaper in first cost as well as in maintenance and depreciation, unless the railroad trestle is built of permanent and therefore expensive construction.

Where the reserve storage is at some little distance from the boiler room, a flight conveyor in combination with a gravity discharge machine with the reclaiming feature is sometimes used. The gravity-discharge elevator-conveyor takes the coal up and delivers it to the flight conveyor for immediate transfer to the boiler room or delivers it to the storage pile. The stored coal can be taken from storage, the same as in Fig. 3, but in this case it is delivered to the flight conveyor, which serves instead of carts to transfer the coal to the boiler room.

This kind of an arrangement is shown in Fig. 5. In this plant the amount of coal consumed per day is about 20 tons, and the amount that can be stored is about 600 tons, or 30 days' supply. Fig. 6 shows a somewhat similar arrangement. In this case the elevator is located about 65 ft. from the end of the boiler room, and the space between it and the building is used for storage, being served by the flight conveyor to the boiler room.

In the opposite direction there is a flight conveyor encircling the pile and having a horizontal length of about 150 ft. When coal is being delivered to this pile, it is elevated by the elevator and carried out on the upper run of this flight conveyor. When it is being taken from the pile, it is fed to the lower run of the flight conveyor in a tunnel underneath the pile, delivered to the elevator, then taken into the boiler room by the other flight conveyor. As the firing is done by hand the coal is simply deposited on the boiler-room floor.

A Pit May Be Used for Storage

The arrangement shown in Fig. 7 is for small anthracite coal. The storage space was excavated so as to form a pit, the coal being stored in the pit and also piled up above the regular ground level. Over 11,000 tons of coal can be stored at this plant, and all except a little that is used in some boilers in an adjacent building is carted to the main boiler room of the publishing plant, a mile or so away. The machinery includes a gravity-discharge elevator-conveyor, a stocking-out flight conveyor and two reclaiming flight conveyors in tunnels under the pile. The gravity-discharge machine elevates the coal and delivers it to the wagon-loading pocket or to the pile, and also transfers coal from the pile to the pocket. The stocking-out conveyor serves to pile the coal on out in the storage area away from the pocket, and the reclaiming conveyors take it from points out of reach of the gravity-discharge machine and transfer it to this machine. The rate of handling is about 40 tons per hr.

For low maintenance cost and reliability the pivoted-bucket carrier type of conveyor excels all others for handling coal, ashes and similar materials. Some makes of these machines have been carefully perfected, so that they represent a high degree of development in the conveying art. With this type of machine the material is carried along in the buckets, which do both the elevating and distributing. The material is discharged by tilting the buckets with a tripping arrangement at the desired points, and the weight of chains, buckets and coal is supported on the horizontal runs by large well-oiled rollers traveling on T-rails. These rollers are confined between T-rails on the vertical runs, so as to guide the chains and buckets.

Two ways of using these machines in connection with reserve storage are illustrated in Figs. 8 and 9. The former has overhead-storage bins directly over the reserve storage, with the carrier encircling both the overhead and ground storage, also encircling an ash pocket. When the overhead storage is depleted, the coal in the reserve storage can be fed to the lower run of the machine and transferred to the overhead bins.

With a reliable machine of this kind to transfer the coal, the overhead-storage can be made quite small and the first cost thereby reduced. Even though the replenishment of the overhead supply is dependent on the frequent operation of the carrier, there is little danger of lack of coal in the overhead bins owing to trouble with the machinery, as breakdowns with a first-class carrier are almost unknown, and repairs which may be necessary at long intervals can be made with little or no delay in the operation.

The other design is quite similar to this, except that the main or reserve supply in this case is placed in a bin at one end, instead of being underneath the overhead bins. This particular carrier has a horizontal run of about 275 ft. and a vertical lift of about 42 ft., or a total length of about 630 ft. Only a little over 8 hp. is required to operate it.

Conveyors Are Cheaper Than Trestles

In many cases, and probably in most cases, where railroad trestles are built for storing coal, a better and less-expensive arrangement could be obtained by having the railroad track at ground level and using conveyors to elevate and distribute the coal; and where an overhead supply is desired, the conveyors can usually be arranged to transfer the reserve coal to the overhead bins. A case where the design was changed from a railroad trestle to a conveyor arrangement is shown in Fig. 10.

The railroad track comes in at a level considerably above the boiler-room floor and the coal-storage area, and it was the intention to continue the railroad track out on a trestle so that the coal could be dropped underneath for the reserve storage and delivered to a conveyor arrangement which would deposit it in a bin in the boiler room for the supply to mechanical stokers.

It was found, however, on further investigation, that the conveyor arrangement, illustrated in Fig. 10, would be cheaper in first cost and would handle the coal more automatically so that there would be less labor cost, and the amount of storage was also largely increased over that which could be conveniently obtained with the trestle. The distributing conveyor takes the coal out along the light trestle and delivers it to the ground storage or takes it directly into the boiler room and delivers to a conveyor over the overhead bin. A feeder is provided at the track hopper to feed the coal regularly to the distributing conveyor, and provision is also made for a possible future crusher installation, though for the present it is the intention to purchase coal already sized.

Underneath the coal pile is a concrete tunnel with a reclaiming conveyor to which the reserve coal can be fed and taken up to the conveyor over the boiler-room bin. The delivery from the overhead bin to each of the three mechanical stokers includes an automatic-weighing hopper which will automatically weigh all the coal which is delivered to each boiler. The capacity of the overhead bin in the boiler room is about 120 tons, and about 2,000 tons can be stored in the outside reserve storage. The daily coal consumption of the plant is about 60 or 70 tons.

In Fig. 11 is illustrated what might be called a combination active and reserve storage all in one, since the overhead bin is made very large instead of putting part of the coal in an outside reserve pile. This of course is expensive construction, but in this case appearance was an important consideration, and an outside coal pile would have been considered unsightly.

The overhead bin is really a large room on the second floor, extending the full width of the boiler room. It will hold in the neighborhood of 5,000 tons of coal. The amount consumed per day is about 60 tons, so that the storage should last nearly 80 days. While this coal is all stored overhead, on account of the large area of the bin there would be a considerable percentage of it which would not flow out of the chutes without being trimmed over to them by hand.

There is also the danger of spontaneous combustion with such a large and deep pile, and steam pipes have been built into the coal bin so that live steam can be discharged into the coal pile in case of fire, though the effectiveness of this method of providing against fire has yet to be proved.

Both the coal and ashes are handled by a single pivoted bucket carrier, with a feeder and crusher at the track hopper, so that the machinery arrangement is about as simple and ideal as it is possible to make it. The handling of the ashes and feeding them to the conveyor are all done in the basement, so that the dirt and confusion of this operation are avoided on the boiler-room floor. This secures about as neat and shipshape a boiler room as it is possible to get.

Weighing Hoppers Are Often Used

Coming now to the equipment, which includes a self-filling bucket for handling the reserve coal, Figs. 12, 13 and 14 show boiler rooms with overhead bins and traveling weighing hoppers for handling the coal. Fig. 12 has the bin outside the boiler room, with chutes through the wall to a 2-ton weighing hopper. As the coal is unloaded from railroad cars it is passed through a crusher and then taken up to the distributing conveyor over the bin by means of a double-strand bucket elevator.

The distributing conveyor delivers either direct to the overhead bin or to a traveling chute which can be moved along the roof of the bin and which discharges the coal into a pile along the railroad trestle. When the reserve coal in the outside storage is to be reclaimed, this is done by means of a clamshell bucket on a standard-gage locomotive crane, the coal being picked up and delivered to the track hopper for transfer to the overhead bin. Fig. 13 shows a storage on a water-front property, the coal being unloaded from boats by means of a locomotive crane equipped with a clamshell bucket and then transferred by means of a weighing car or larry, which is pushed by the crane, the car delivering either to the outside storage or to a track hopper for transfer to the bin in the boiler room.

From the track hopper the coal is fed by means of a reciprocating feeder to a crusher, and then goes to a pivoted bucket carrier which runs up an incline and delivers to another pivoted bucket carrier that distributes the coal in the overhead bin. The weighing hopper in the boiler room has a platform near the floor upon which the operator can ride, but which is near enough to the floor so that he can easily get up and down any time he wishes.

Fig. 14 shows an outside reserve storage served by a locomotive crane traveling on a circular track. When the coal is unloaded from the railroad cars, it either goes through a crusher and up into the overhead bin in the boiler room or into a pit alongside the track hopper, from which the clamshell bucket picks it up and delivers it to the outside pile. When it is being reclaimed, it is handled from the pile back to the track hopper and up into the bin. This makes an excellent type of locomotive-crane storage.

Fig. 15 shows the possibility of using a locomotive crane on a track along a wharf and piling the coal directly back of the railroad track as it is unloaded from boats. In this case there is a conveyor to the boiler room at one end of the storage area, and the coal is either taken out of the boats and delivered directly to the receiving hopper for the conveyor, or if it comes from the storage it is picked up from the area near the receiving hopper and delivered to it without moving the crane, or if this area is all cleaned up, as is frequently the case, the crane takes the coal from farther along the wharf and travels with it to the receiving hopper.

This is not such a slow operation as it might seem, as the crane has a traveling speed of from 400 to 500 ft. per min., so that it can go 200 ft. down the wharf and back in a minute or less; and with this as an average length of travel, a rate of 30 tons per hr. could easily be obtained with a 1-ton bucket.

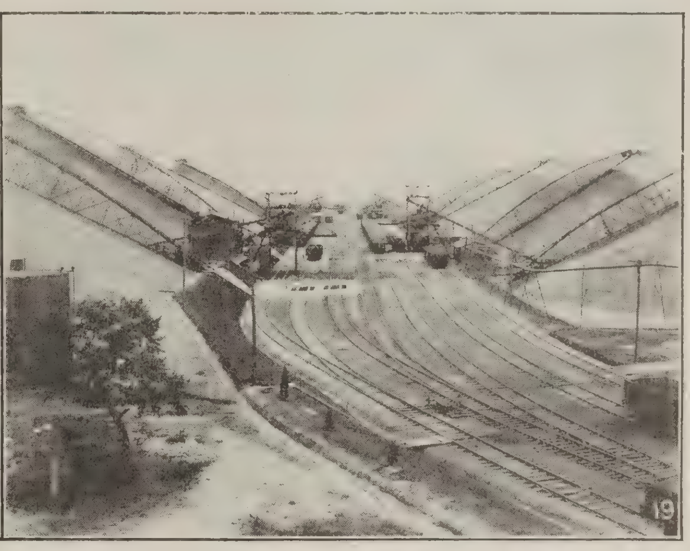
When a large storage capacity for soft coal is desired, say over 5,000 or 10,000 tons, the cheapest way to obtain it is to use a large radius locomotive crane and store the coal in a circular pile, as shown in Fig. 16. This shows a crane with 100-ft. radius traveling on a double circular track with 20 ft. from center to center of the two tracks. With one circular track for the crane and a pit at the center for the buckets to take the coal from, it is possible by this method to store over 70,000 tons of coal. The buckets ordinarily used with a crane of this size will hold 3½ tons, and handling-capacities as high as 240 tons per hr. have been obtained with them.

Storage by Clamshell Bucket and Monorail Trolley

Clamshell buckets handled by electric hoists running on overhead monorail tracks have been used more or less for storing coal and taking it into the boiler room. Such a machine is shown in Fig. 17. The operator travels along with the electric hoist in a small cage and controls both the hoisting and the traveling motors. The coal is picked up from a pit to which it is discharged from the railroad cars and taken either directly into the boiler room and delivered into the stoker magazines or piled on the ground underneath the monorail track.

18

THE SHADYSIDE PLANT OF THE NEW YORK EDISON CO. OPPOSITE NEW YORK CITY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PHILADELPHIA & READING COAL AND IRON CO. STORAGE PLANT AT BRIDGEPORT, PENN.

This makes a simple, and usually not very expensive type of storage and delivery to the boiler room, but it necessitates keeping an operator continuously at work handling the coal, and if there is any trouble with the hoist or the operator is not there all the time it means getting the coal in by hand.

This arrangement also complicates the crushing of the coal if it is to be received as run-of-mine and crushed before it is delivered to the stokers. A crusher can of course be placed under the track hopper, so that the coal will go through it before it goes to the pit and then to the boilers, or to the outside storage, but this necessitates a deep pit unless the local conditions are such that the track is elevated.

The storage plant of the New York Edison Co., at Shadyside, N. J., across from New York City, is shown in Fig. 18. This plant has two 100-ft. radius locomotive cranes and a cable railway for distributing the coal along the length of the plant and taking it back. It also has both unloading and loading machinery for transferring the coal from and to boats. The storage capacity of this plant is 225,000 tons.

DODGE SYSTEM IS ADVANTAGEOUS WITH ANTHRACITE

For storing sized anthracite coal on a large scale, by far the most successful method is by means of the well-known "Dodge system," wherein the coal is piled in large conical heaps by conveyors running up inclined trusses and the reclaiming is done by pivoted conveyors which are swung around at the ground level on circular tracks and take the coal back and deliver it to the railroad cars. The Philadelphia & Reading Coal and Iron Co.'s plant of this type at Bridgeport, Penn., is shown in Fig. 19.

This plant has a capacity of 480,000 tons of coal in eight piles. The capacity of the stocking-out conveyors is 1,800 tons per day of 10 hr., or a total stocking-out capacity of 14,400 tons per day. There are four reloading conveyors with a capacity of 2,500 tons per day each, or a total capacity of 10,000 tons per day, or 10 hr.

In designing a reserve-storage plant the local conditions and requirements have to be studied carefully, as each installation is a different problem. There are also almost unlimited combinations of different types of machines to obtain the results desired, so that expert knowledge and long experience are necessary in order to select the type of plant which will give the best satisfaction and which will be cheapest in the long run.

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Pages from a Miner's Notebook: Prohibition and Coal Mining

I am not a prohibitionist, neither do I patronize the saloon. Therefore, perhaps, I am qualified to set down here impartially an example of the evil (?) which will be wrought by the eventual closing of the saloons by laws enacted at the behest of pestiferous meddlers.

During the day Jim Bates is a miner. His place is close to mine—so close in fact that I often hear the heated words that pass between Jim and the pitboss and frequently catch a glimpse of the troubled face of the latter official after one of his many daily visits to Jim's place.

During the night Jim Bates is chief oracle at the bar of the saloon. There is no argument for the liquor traffic which Jim hasn't at his tongue's tip and which he will not hesitate to advance, under stimulus of a drink or two, in a loud voice for the edification of those who occasionally patronize the place.

There is nought but evil in prohibition, according to Jim. And he can prove it. He can prove it to the satisfaction of the bartender who plies him with drinks "on the house" and after an evening's session has proved it to himself as he staggers home.

Night before last there must have been an extra hard-headed bunch for Jim to convert. He went directly from the mine to the saloon, where he stayed until the place closed. With some three hours' sleep and with the grime of the previous day still visible on all but the high spots, he went to work yesterday morning. I argued with him that he was in no condition to enter the pit. He was shaking with racked nerves, his tongue was thick and his eyes were cloudy, but my arguments were in vain.

I heard the pitboss call him down, not roughly or unkindly, but with a stinging sarcasm that was lost upon the alcohol-soddened brain. Then there were instructions as to a prop Jim should set immediately. The pitboss left, and Jim kept on loading the car. In another minute or two I heard a fall. Three of us lifted the rock from Jim's unconscious body. Four of us carried him home.

Today an unofficial committee solicited funds to buy Mrs. Jim a wash-boiler, tubs and soap and a supply of groceries to last until she can take in a few washings.

Jim, with a wrenched back and broken leg and arm, will have the best of care and the family will not suffer even though there isn't much washing to be had, as a considerable fund was raised.

Many of the men gave five dollars and pledged themselves for more if necessary. The proprietor of the saloon grudgingly gave 50c. It may be that he was engaged at the time in pondering the "evils" that will befall him should nation-wide prohibition become established.

Ballads of a Coal Miner--IX

Written expressly for Coal Age

Peace

BY BERTON BRALEY

Six weeks of strike an' now the row is ended,
We're back to work an' gettin' out the coal;
Our leaders say our victory is splendid
An' things is rather better, on the whole—
But say, somehow the whole blame thing seems foolish
With all its loss an' trouble, wrath an' hate;
If only people wouldn't be so mulish
There wouldn't be no strikes—we'd arbitrate.

If men could only learn to KNOW *each other*
An' realize each other's point of view,
Instead of lettin' prejudices smother
Their common-sense the way they seem to do;
If boss an' men would only get together
As human bein's, not as bitter foes,
We might be done with fightin' hell-fer-leather;
We might have peace—we need it, heaven knows!

BUT NO, *the owners think we're only cattle; we think they're worse than tyrants of the past;*
An' so the row goes—battle after battle, strike after strike—an' will go, to the last.

Steel Mine Timbering

By Samuel Fray, Jr.

The consistent application of steel to mine timbering in the United States dates from 1907. It is conservatively estimated that in the year 1914 steel mine timbers of various kinds were utilized to timber 20 mi. of headings, and this despite the fact that the year 1914 was by no means an active one in the coal-mining industry.

Among the large operators in the bituminous coal fields of western Pennsylvania is W. J. Rainey, with general offices at Uniontown. This company operates seven slope and drift mines and four shaft mines. Its output of bituminous coal is about 3,000,000 tons per year, much of which is utilized in the manufacture of coke.

Within the last three years this company has installed some 2,200 sets of steel mine timbering in approximately 2 mi. of headings. Installations are to be found in several mines of this company, but the views herewith may be considered as representative of practice in this district. They were taken in the Royal Works mine, Fayette County, Pennsylvania.

Fig. 1 shows an underground mine stable. This houses 38 horses and mules. It is not a temporary makeshift, but a structure intended for permanent use and convenience and compares favorably with first-class structures on the surface.

The stable is constructed alongside the main haulage way. The roof is carried on 12-in. I-beams, between which are sprung concrete arches. The ends of the beams rest on concrete side walls. About middle length 4-in. steel H-beam posts are placed under each I-beam roof support. These posts serve as a partial support to the roof beam, and also form the back part of the stalls, which are separated by concrete partitions. The broad flanges of the H-beam permit concrete to be molded between them, thus insuring permanent anchorage. The stable shows, both from a sanitary and a mechanical point of view, the progressive character of the management and its endeavors to make underground conditions for both men and animals as favorable as those on the surface.

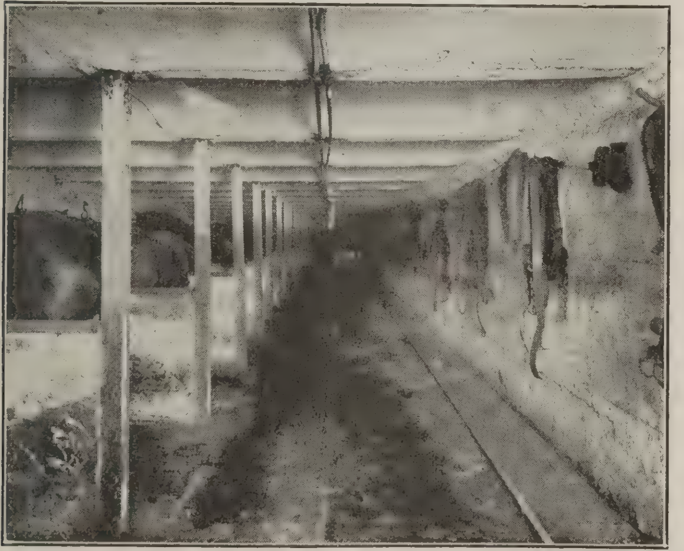

FIG. 1. STEEL TIMBERING IN AN UNDERGROUND STABLE

Fig. 2 shows a portion of the double track main haulage way. This is 18 ft. wide and 8 ft. in height. It is framed with three-piece gangway sets consisting of 12-in. steel I-beam collars and 5-in. H-beam posts, the latter resting on concrete side walls. The collars are separated by wood spacers and lagged overhead by plank. Trolley wires are fastened to the I-beam collars by Ohio Brass Co. trolley-wire hangers, particularly designed for the attachment of trolley wires to steel timbers. The power lines and light wires, as shown in the view, are attached to collars and posts on wooden insulator blocks secured by hook-bolts.

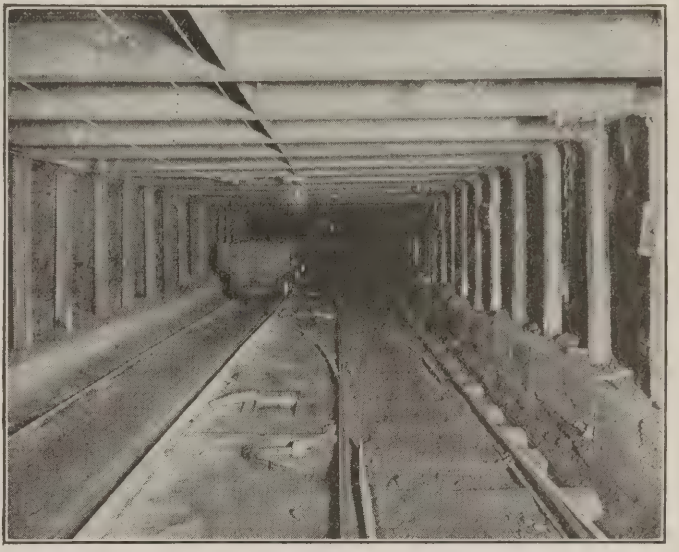

FIG. 2. A PORTION OF THE DOUBLE-TRACK MAIN HAULAGEWAY

The appearance of this main haulage way commends itself to mine superintendents desirous of excellence in mine timbering. One is impressed also by the great contrast in the amount of labor connected with the placing of such sets as compared with the handling of the large sticks of wood timber of sufficient strength to serve for the proper support of the loads carried by the steel timbering, and also with the security which results from the omission of a center line of posts which would probably have been necessary if the haulage way had been framed in wood.

The installation at the Royal Works reflects great credit on the management. The expenditure for steel has proven beyond question a satisfactory and economic investment.

BY THE WAY

The man who laughs outside when he is crying inside, who wears a smile on his face when tears fill his heart, has mastered the greatest of all arts—self-control.

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Some coal-mine officials have one kind of religion for Sunday and a different brand for Monday. The only kind that's worth while is the kind we can wear every day in the week.

⁂

Every man who has attained great heights has been an idealist; for if he were not, his ultimate aim or goal would soon have been reached and the race finished. There must always be a further outlook on the highway leading to success.

The Labor Situation

SYNOPSIS—An uneventful meeting of the Shamokin district of the United Mine Workers of America was held at St. Clair, Penn. The miners declare that the Colver wage rate cuts heavily on the scale adopted for central Pennsylvania. The miners in Ohio are now working more steadily except in the mines of the Sunday Creek Coal Co.

On Oct. 19 the delegates from district No. 9 of the United Mine Workers of America met in the Columbia hose company hall at St. Clair, a small town near Pottsville, Penn. This meeting while large did not arouse much interest because the tridistrict convention had already been held, and consequently none of the matters brought before the district had reference to the threatened strike.

Of course the usual resolutions were passed calling for a pardon for Patrick Quinlan, the labor leader of New Jersey, and another blaming John D. Rockefeller, Jr., for the conditions in Colorado and asking that the report of the Industrial Relations Commission be published in full. But the important resolution was one in which it was proposed to hold meetings biennially instead of annually and to elect the officers of the union for two years. This is intended to save much unnecessary expense. After much discussion the matter was referred to the committee on the constitution. It was eventually decided to make the election of officers biennial, and the president will hereafter draw $167 a month and expenses.

A resolution called for the separating of district 9 from the tridistrict organization, but that motion was declared unconstitutional. The Butler controversy, which has been carried to the courts and made the subject of injunctions, seems to have lost some of its bitterness. A resolution was submitted stating that the district officers had erred in taking up the case against Butler and containing a clause forbidding the district from using any further money in the matter. It was tabled by a large vote. The convention concluded its session on Saturday, Oct. 23.

Miners Raise Salaries and Honor Their Founder

The miners who are demanding an increase of wages of 20 per cent. took a dose of their own medicine and voted the officials of the organization 10 per cent. increase and the two stenographers 20 per cent. For efficient service in preparing for the opening of the convention, during which the force worked overtime, these ladies were granted an allowance of $25. The miners, it will be remembered, are asking in their third demand for time and a half for all overtime and double time on Sunday and holidays. They showed in this vote an excellent disposition to do as they are done by.

A wreath was placed by the delegates to the convention on the grave of John Siney, Sr., the man who is regarded as the founder of the union. He was a resident of St. Clair and his family still lives in the town. His body was interred in St. Boniface cemetery at that place. District President Matthews made an address, followed by Daniel Duffy. A monument was long ago erected to John Siney, this tribute to his memory being unveiled on Nov. 1, 1888.

The convention decided to publish the by-laws of the district in Polish, Slavish, Lithuanian, Greek and Italian, as 87 per cent. of the members are of alien extraction. Though at one time Butler declared that the convention was "packed," meaning not representative, in the end harmony prevailed, and everyone is working to further the progress of the union. The convention next year will be held at Mt. Carmel, Penn.

Colver Scale Said To Be Lower Than Union Rates

The Colver mines are working steadily, but the union leaders continue to make complaint that the wages paid by the Ebensburg Coal Co. need upward revision. In a reply to General Manager E. S. Saxman, Charles O'Neill, the vice-president of the district, states that the district price for pick mining is 72c. per ton and the price at Colver is only 52c.; that cutting by machine and loading should be paid for at the rate of 56c. per ton, whereas at Colver the rate is 47c.

The district price for inside day labor is 33c. to 42c. per hr. At Colver that hourly rate is only 25c. to 30c. However, the rate for loading after machines is 42c. in both Colver and in mines working under the district scale. O'Neill claims that there is no checkweighman on the tipple. He declares that because of the low rate paid and the reopening of union mines nearby, the village of Colver has now 60 idle houses and has lost 400 miners.

The miners in Ohio are for the most part at work. The operators slowly and with no great degree of good grace have put in the weigh scales in accord with their contracts, and so there is no longer any reason for strikes. The house rent which was in arrears is probably largely paid and furnishes no longer any excuse for disagreement. Thus strike activity is on the decrease, and concurrently the improved condition of the coal business has made it expedient to reopen the mines which were closed, though owing to the long period of idleness no small amount of expense had to be incurred in making them fit for operation.

In the northern field of Ohio there is much discontent with the results of arbitration, and the miners of subdistrict No. 5 want to hold a convention to discuss the wage scale, but little can be done by such a meeting as the contract will remain in force till next spring.

In the Hocking field improved conditions have caused almost all the small plants to resume, but the Sunday Creek Coal Co. continues obdurate. It seems likely that if prices improve even that operation will be disposed to take advantage of the bettered demand, continuing however to protest, with some justice, that only unusual conditions make operation feasible. At present the number of miners drawing strike benefits in the Hocking field is reduced from 6,000 to 2,000. A large number of men have left for other fields, some having gone to the nonunion mines of Kentucky and West Virginia.

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New Sales Plan for the Central Illinois Operators

The principal coal producers of Fulton, Peoria, Tazewell and Mercer Counties in Illinois have formed a sales plan similar to the one followed by the operators of Franklin County, Illinois. The following companies at present compose the organization, while a few others not yet parties to the arrangement will likely join later: Alden Coal Co., Big Creek Collieries Co., Crescent Coal Co., Eagle Mining Co., Logan Coal Co., Monmouth Coal Co., National Coal Mining Co., Star Coal Company of Galesburg, Silver Creek Mining Co. and Simmons Coal Co.

W. J. Spencer has been elected secretary, with headquarters at Brereton, Ill. It is said that these producers have agreed to report to the secretary, for purposes of comparison, the prices at which all shipments are sold and that schedules will be adopted later setting forth the minimum figures at which the different grades or sizes will be sold in the territory served by these mines. The sales territory will be divided into zones and prices fixed for each zone.

COMING MEETINGS

Illinois Mining Institute will hold its annual meeting on Nov. 20, 1915, at Springfield, Ill. Election of officers will be held and the day will end with a banquet.

American Society of Mechanical Engineers will hold its annual meeting Dec. 7-10, 1915, New York City. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

Coal Mining Institute of America will hold its winter meeting Dec. 21-23, 1915, at the Fort Pitt Hotel, Pittsburgh, Penn. Secretary, C. L. Fay, Wilkes-Barre, Penn.

Engineers' Society of Western Pennsylvania holds its monthly meeting third Tuesday of each month; section meeting, first Tuesday. Secretary, Elmer K. Hiles, Oliver Building, Pittsburgh, Penn.

Western Society of Engineers, Chicago, Ill., holds its regular meeting first Wednesday of each month, excepting July and August. Secretary, J. H. Warder, 1785 Monadnock Block, Chicago, Ill.

Kentucky Mining Institute will hold its winter meeting Friday and Saturday, Dec. 3 and 4, 1915, at Lexington, Ky., with headquarters at the Phoenix Hotel. Secretary, Ivan P. Tashof, Lexington, Ky.

United Mine Workers of America will hold its annual convention in St. Louis, Mo., beginning Jan. 17, 1916, and continuing for three weeks. Secretary-treasurer, William Green, 1102-1109 Merchants National Bank Building, Indianapolis, Ind.

Who's Who in Coal Mining

John Lloyd

John Lloyd is not the kind of efficiency engineer the magazines have made familiar in the past few years. He has not made a specialty of motion study or of the arrangement of machines in a shop, though he knows all about the shop and how men should work. He did not take the title and then try to find out what he knew about efficiency, but after he had grown to be an efficiency engineer in reality the position and title were made for him.

He was born in North Wales, not far from Chester, England. His father was a miner there, but came to America early in life and took up work in the anthracite mines, where he was killed by an accident in 1875. There are two other sons—one president of the Coxe Traveling Grate Co. and the other in charge of part of the electrical equipment of the Central Railroad of New Jersey. The mechanical instinct and aptitude are inherited from the mother whose father and grandfather were successful mechanics.

JOHN LLOYD
Efficiency Engineer, Lehigh Valley Coal Co.

John Lloyd had three years of schooling before he went to work at the age of 9. His first job was that of doorboy. Work of this kind is not hard, but the boy has to be there and stay on the job, and in those days the hours were longer than they are now. John Lloyd spent the next 11 years at inside work, running hoisting engines and pumps, putting up brattice and mining coal—in fact, doing almost everything in the line of underground work.

In these 11 years the mines were idle for two periods of nearly six months each, on which occasions young Lloyd went to school. The rest of his education was gained when there was time to spare for it, mostly at night. Sometimes he had the help of tutors and sometimes he worked alone. His first diploma was from the International Correspondence Schools for a course in mechanical engineering. At one time while he was erecting the great sand wheels for the Calumet & Hecla Mining Co., he had as assistant a graduate of Cornell, and the two helped each other. The Cornell man gave Lloyd the advantage of his training, and Lloyd gave in exchange the benefit of his experience. John Lloyd did not have much time for school, but he has made himself a well-trained, well-educated man.

After working in the anthracite mines, Mr. Lloyd went to Mexico and to Colorado and worked as a miner in the bituminous mines, and for a short time he was in the Bessemer Steel Works at Pueblo. Then he went back to Pennsylvania to work for the Dickson Manufacturing Co. at Scranton. This company made locomotives and stationary engines, and Mr. Lloyd had the advantage of special training in the shops. Before long he was made superintendent of erection and had charge of a large number of important contracts. One of these was the sand wheels used by the Calumet & Hecla to elevate slimes. These are 54 ft. in diameter. They were erected in 1890 and are still in use.

He spent seven years with the Dickson company, and then went to the Vulcan Iron Works and later became head machinist for the Temple Iron Co. Next he was chief draftsman for the Jeanesville Iron Works, and after 13 months with this company he became assistant to the mechanical engineer of the Lehigh Valley Coal Co. After three years, in 1906 he was made inspector of equipment. His duties became very extensive, and in February, 1914, the position of efficiency engineer was created to fit the work and the man. In this position Mr. Lloyd looks after the condition and performance of all equipment and makes the necessary tests. He also has charge of the first-aid and rescue work. There is a corps of three assistants who handle such work as Mr. Lloyd cannot attend to personally.

With the aid of one of his brothers he invented the Wyoming automatic eliminator to remove water from steam. For a time he devoted himself to developing this and placing it on the market. It was patented in 1898. It is manufactured in this country by W. H. Nicholson & Co., of Wilkes-Barre, and by other companies in Canada and England. The device has been frequently improved and in every way kept up to date; additional patents have been granted from time to time.

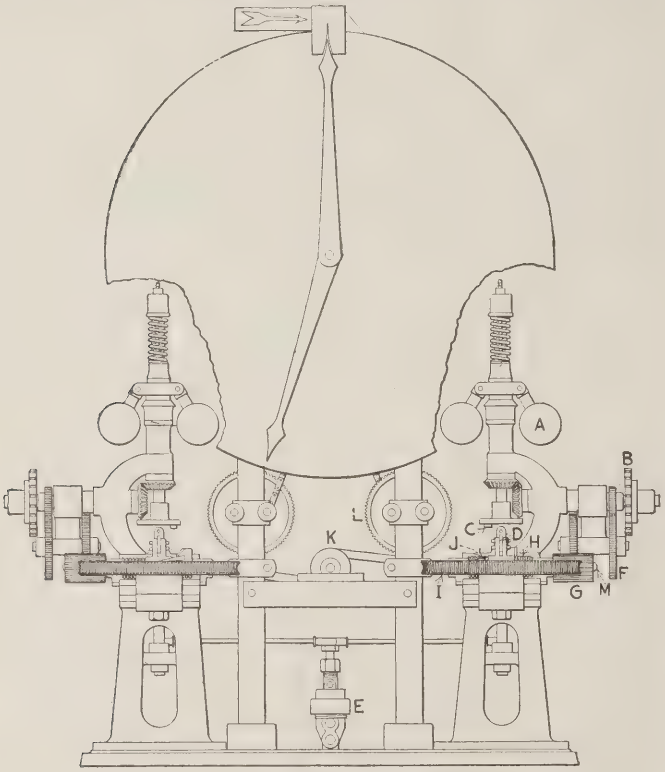
Playing is not much in Mr. Lloyd's line, because he never had much time to learn how, but he admits that he likes to drive his auto. Occasionally he fishes a little, but as far as is known he does not tell stories about it. He is a member of the American Institute of Mining Engineers and of the Engineers' Society of Northeastern Pennsylvania. All of which is a pretty good record for a boy who went to work at 9 years of age.

New Apparatus and Equipment

New Safety Governor

An improved type of overwinding and overspeeding apparatus for use in connection with hoisting engines serving either shafts or slopes has recently been developed and placed on the market by Royer & Zweibel, of Wilkes-Barre, Penn. It is known as the Roybel emergency governor.

The construction and operation of this machine are extremely simple. Referring to the accompanying drawing, the flyballs *A* are driven by the sprocket *B,* which in turn is driven direct by chain from the drum of the engine. The stem of the governor, which carries two separate springs, terminates at its lower end in a disk carrying the pin *C.* As the speed of the engine increases and the balls fly out, the stem descends, and at a predetermined maximum allowable speed the pin *C* clears the lever *D* by a small amount. The flyballs are now opposing only one of the stem springs. If the speed is increased, exceeding the predetermined amount, the flyballs compress both springs, and the pin *C* strikes and throws the lever *D.* This immediately applies steam to the brakes through the three-way valve *E.*

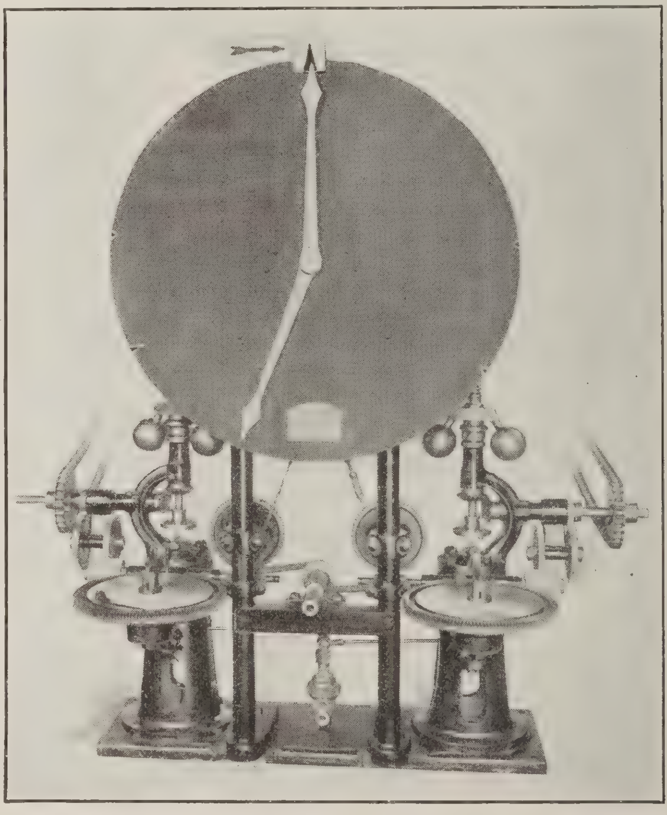


DETAIL OF ROYBEL EMERGENCY GOVERNOR

Motion from the sprocket wheel *B* is transmitted through the intermediate shaft and gears *F* and the long pinion *G* to the worm *H,* which drives the wormwheel *I.* Near the rim of this wheel, at a point adjustable to suit the conditions, is placed a double or graduated incline *J.* The arrangement is such that, when the landing is approached, this incline lifts the lever *B* into close proximity to the pin *C,* and unless the speed is properly reduced and the pin *C* allowed to rise with the disk and governor stem, the lever *B* will be thrown and the engine brought to a standstill.

When the hoist is complete and the cage stands in the dumping position, the steep portion of the incline *J* is touching the lever *D,* and any further movement of the cage in an upward direction will apply the brakes. Overwinding, overspeeding and moving the cage in the wrong direction are thus impossible.

The machine is equipped with a dial provided with double pointers—one connected with and controlled from the tight drum and one from the loose drum. The relative position of the pointers then indicates the level being served. As the cage leaves the dumping point the red semaphore at the top of the dial swings down, while when the other cage approaches the dump, a semaphore on the other side appears. This gives a visual indication to the engineer of which cage is to be lowered. This dial thus indicates at all times the exact position of each cage and which landing it is serving.



FRONT VIEW OF THE GOVERNOR; NOTE LANDING MARKINGS ON DIAL

When the signal to hoist men is given, the engineer gives a return signal by throwing a lever. This not only gives the bottom cager a visual signal (usually an electric light), but by revolving the crank disk *K* moves endwise the worm shaft carrying the worm *H* and pinion *G,* thus revolving the wormwheel *I* until the incline J takes a position corresponding to the ground landing. It now becomes impossible for the cage to approach the ground landing at too great a speed or to pass it. A second worm on the same shaft as the worm *H* operates the wormwheel *L*, which through a sprocket chain actuates the pointers on the dial.

As may be seen from the accompanying illustrations, this machine is extremely simple in design, while its operation is positive. Machines of this type have been in use for some time at various mines in the anthracite region and thus far have given satisfaction.

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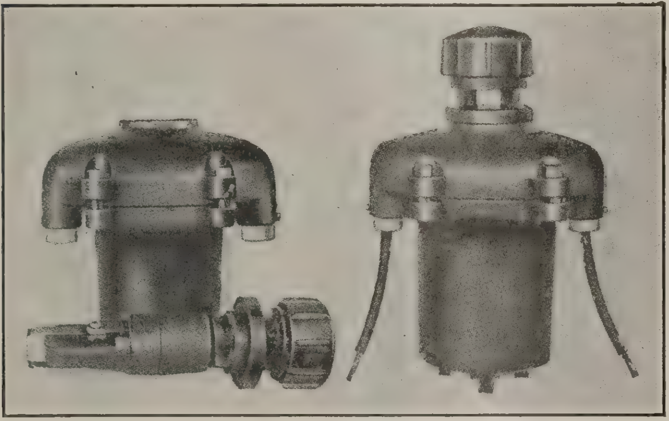
An Oil-Immersed Fuse

An oil-immersed fuse cutout for high-tension work has been placed upon the market by the D. & W. Fuse Co., of Providence, R. I. The unreliability of inclosed fuses on high-tension work is generally known, and a study of the problem involved induced the company to place this oil-break fuse before the public.

There is nothing new in the idea of a fusible wire placed in oil and used as an electric protective device. In the past, however, the design of this piece of apparatus has been crude and its operation as a general thing unsatisfactory. The new type of cutout has eliminated many of the defects in the older forms of this apparatus and has proven satisfactory under severe conditions and over considerable periods of time.



FUSE WITH CARRIER REMOVED FOR FUSE RENEWAL; ALSO APPARATUS ASSEMBLED

In the new apparatus the fuse and its carrier are immersed in a special oil that prevents the formation of an arc. The body of the device is provided with an effective venting system that prevents any accumulation of pressure within the casing and the loss of any appreciable quantity of oil through blowing out.

The oil container has at its bottom a plug that permits the drawing off of the oil when this becomes necessary. Under ordinary conditions of service, however, this would not require drawing off and replenishment more than once in one or two years.

These cutouts are equipped with flexible cable terminals, to which the line terminals may be soldered. This eliminates the necessity of making complicated connections within the device itself.

At present three capacities of cutouts are on the market, all designed for overhead line construction and being in capacities of 50, 100 and 200 amperes at 2,500-volt pressure. The fuse pieces proper are made from a carefully prepared special alloy of low melting point and high conductivity.

A commercially practicable protected device of this nature is limited as to dimensions and consequent overload capacity. Special precautions have been taken to design the apparatus so as to render re-fusing safe for the operator. A new fuse may be inserted even when the line is short-circuited without risk to the repair man, as the whole device is especially locked against the ejection of the carrier and the oil in case of the unexpected blowing of the fuse during the operation of re-fusing.

This is effected through automatically locking the cover before contact is made with the fuse terminal. The cutout is not intended as a switching device. It may nevertheless be depended upon to open moderate loads when used in this manner.

Recent Legal Decisions

Proving Relationship of Employer in Injury Suits—When defendant in a suit for injury to a miner denies the relationship of employer to the injured man, any evidence, however slight, tending to show who was operating the mines on the day of the accident is properly admitted. (Alabama Supreme Court, Amerson vs. Corona Coal and Iron Co., 69 Southern Reporter, 601.)

Contributory Negligence of Driver—There can be no recovery for death of or injury to the driver of a coal wagon who drove his team at a rapid pace along a street while one wheel of the wagon was in the gutter, although the city may have carelessly permitted the obstruction to exist in the gutter, which, being concealed by snow, caused the accident. (Pennsylvania Supreme Court, Short vs. City of Carbondale, 95 Atlantic Reporter, 254.)

Authority of Corporate Officers—A company engaged in buying and selling coal is entitled to repudiate a purchase of bank stock made by its manager with funds of the corporation, without express authority. Persons dealing with the manager of a business corporation have no right to assume that he has any authority to enter into a transaction beyond the scope of the concern's regular business. (South Dakota Supreme Court, Porter vs. Lien, 153 Northwestern Reporter, 905.)

Discrimination by Railway Company in Furnishing Cars—The fact that coal is sold by a mine owner f.o.b. the mines does not prevent him from securing redress before the Interstate Commerce Commission for unjust discrimination in furnishing cars for shipment of the coal if the shipments are of interstate character. But after he has obtained a ruling from the commission to the effect that the carrier has been guilty of unjust discrimination, it is too late to maintain suit in a state court to recover damages under a state statute on account of the same transaction. (United States Supreme Court, Clark Bros. Coal Mining Co. vs. Pennsylvania R.R. Co., 35 Supreme Court Reporter, 896.)

Effect of West Virginia Mining Laws—The West Virginia Mine Foreman Law does not relieve an operator of the duty of maintaining motors and motor tracks in reasonably safe condition, that duty not being devolved upon the foreman. An operator's failure to adopt or post a rule regulating the number of cars that may be hauled by a motor renders him liable for injury to a miner directly attributable to such failure. A report of a district mine inspector respecting the condition of a mine as to safety is not legal evidence in a suit for injury to a miner, although of course the inspector may testify to conditions found by him. (West Virginia Supreme Court of Appeals, Jaggie vs. Davis Colliery Co., 84 Southeastern Reporter 941.) An operator is liable for injury to a minor employee resulting from failure to warn him against dangers of which he cannot reasonably be expected to know. Such an employee may rely upon his superintendent giving him instructions concerning dangers naturally attending work to which he is assigned, unless by reason of his capacity and experience and knowledge of the hazards of the work he fully appreciates the dangers and proper means of avoiding injury therefrom. (Dillon vs. United States Coal & Coke Co., 84 Southeastern Reporter, 956.)

Editorials

Mr. Dean's Remarks Upon the Output of British Mines

Americans have for a long time wondered at the low output of European mines. When a visitor comes from across the water and the matter is discussed, he usually is quite unable to explain why the countries outside Europe secure larger tonnages per man than do the mines in the confines of that continent.

In a recent paper read before the North of England Institute of Mining Engineers, Samuel Dean, an Englishman, now with the Colorado Fuel and Iron Co., who has traveled extensively in Great Britain, France and Germany and has visited the mines there, states that he has found the answer in the small equipment, especially the small mine cars, in use in those countries.

His advice to the British is the same as that of Michelangelo to Raphael—"amplius"; that is, larger. After being thus admonished Raphael produced those wonderful cartoons that made him famous, and the advice of the artist is scarcely less applicable to the needs of all Europeans who are engaged in trade. They with their interest in embellishment have built beautiful plants; with their instinct for minutiae have developed the preparation of coal for the market to a wonderful degree of perfection. But in the larger matters they seem to fall behind. There is always something hinders them from a large concept of business.

The railroad cars in Great Britain, for instance, have a capacity of only about 10 tons, because the heavier material goes by sea and not by land, because the turntables and bridges would have to be rebuilt if the equipment were made larger, because the local shipper wants a small car and will not willingly combine with his neighbor to take a part of a "goods waggon," and also because the horse-switching would have to be abandoned at the local stations if the cars are made larger. All of which are excuses, not reasons, if the railroads would only see it.

In the mines, the "tubs" must be small; for is not the coal low? do not women in many cases have to dump them? is not the equipment already standardized? are not the ponies too light to haul heavier loads? and so on *ad infinitum*. These also are not reasons as we see them.

The foreigners who visit here are shown our finest mines with the thickest coal. If they were taken to the workings where coal under 3 ft. thick is mined, they would find the roof taken down or bottom lifted and room made for a fair-sized car of great width and suitable gage. They would see that low headings do not involve rats of mules or ponies, but electric haulage.

There are other causes than pigmy equipment for low production in Europe. One is the attitude of the unions, based not so much on pure resistance to authority as on a false political economy. They do not believe a man is paid in what he produces. They believe the company pays what it will and that small production will not involve low pay if union activity is only sufficiently intense. Americans know differently and realize that the baker must bake bread if he would feed many children and the miner must mine much coal if he would have any large measure of prosperity. His brain has not yet been addled by a century of false reasoning.

Moreover, the mines of Great Britain are often extremely warm and enervating, and this fact tends to reduce the tonnage. This can be met partly by a more generous coursing of air, which is in many mines not even equal to that common in the best American practice. The relations between capital and labor can be solved by a sympathetic discussion of the question of wages and profits, and the matter of small units can be corrected by ordering new and larger equipment and giving more attention to the larger problems of production than to the grading of product and the building of mammoth power houses. These latter details are important, but they take second place compared with volume of output whereby marked economies can be secured.

The Colorado Settlement

The settlement between the miners and the Colorado Fuel and Iron Co. is a great triumph for everybody. Peace, harmony, the reëstablishment of industry are blessings not to be regarded lightly, but it is absurd for the organizers of the strike to claim it in any sense as a victory of their arms. The true success has been the renewal of the order they destroyed and the peace which they violated.

At best the company has made a contract with its men to deal with them under that instrument as it dealt with them before without it. Wages have not been raised; the hours, which were already 8 hr. per day, have not been shortened; checkweighmen, not denied before the strike, are permitted by contract now.

The four achievements were the bringing of Rockefeller to Colorado, the formation of the arbitration committees, the provision which practically secures that men shall not be discharged for incompetency or any other reason than the violation of a recognized offense and the promise to raise wages synchronously with competing fields. For none of these things was the strike started. Unless the recognition of the arbitration committee is considered as tantamount to an acceptance of the union, which that organization vigorously denies, there is nothing in the instrument covering those demands of the union to which the company had refused to concede.

The best policy of the union will be to leave the coal mines of Colorado severely alone for the present. If the existing arrangement is loyally followed by the Colorado Fuel and Iron Co., and other operating concerns imitate it, the men will have all the union promises, and Colorado competition will not make other states reduce their mining price. If the agreement is not followed, then the union will have some reason to try to invade Colorado again.

But so long as the men in Colorado are getting their just dues the union may well keep away, remembering that the purpose of the union is not, or should not be, to promote strikes and can never rightly be to seek its own aggrandizement. Its excuse for being can only be found in its promoting the interests of the workingman when those interests are assailed. Like many other organizations, the union is apt to be started for a well-defined purpose, and ultimately its work is extended, not so much for that purpose as for the good of the order.

Meanwhile the operators of Colorado will do well to watch their conduct and not give the union an excuse for anything but a merely perfunctory activity. And the union men allowed to remain within the camps may prove by their conduct that the union button is not a badge of disorderliness, but a mark of honor. There is too much talk of the "eternal conflict," as if war between capital and labor were an end in itself, instead of an abnormal condition only existing when one or the other is at fault.

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West Virginia's Trade Prospects

Any paper one may pick up from West Virginia assures us that the state is about to go into bankruptcy as the result of an increase in freight rates that will make it impossible to operate the coal mines. Such a volume of untruth has been unloosed about this matter that it really becomes any paper having a duty to the coal industry and to the public to print the truth of the situation without fear or favor.

Really *Coal Age* cannot believe that the change is going to do any more than prevent a certain undesirable condition from continuing any longer. For a long time the operators of Ohio and Pennsylvania have been transferring their capital from those states to West Virginia. Year by year they have closed down their plants in manufacturing states, where coal and the means of its utilization are located side by side, to open up in a state where a lower wage scale prevailed and a lower ton-mile freight made access to outside markets easy.

These conditions have built up West Virginia. No one wishes to see that state idle; no one desires to see its plants abandoned. But conversely no one would desire that the people in the neighboring states be unemployed and their mining improvements rotting to the ground.

The action of the railroads passing through West Virginia being more generous to that state than to other states adjoining has had this latter effect. Bankruptcy and dormancy are normal conditions for plants in both the Buckeye State and the Keystone State.

Some of the operators in West Virginia who are strongest in defending those conditions in the state that have injured other commonwealths have idle holdings in Pennsylvania and Ohio, and they know that these are facts that have just been stated, and their former employees also know it, for until the recent generous accession of business these miners were idle nearly all the time.

But it cannot well be expected that West Virginians would willingly see the locust pass over that state as it has passed over Ohio, if it could be possibly avoided, no matter what may have happened in the past. People must be willing to see justice done *now* and pass a ready statute of limitations to cover the past. No group of industrial workers must suddenly be deprived of work; no tipples, shafts or villages must be allowed to decay by a too-sudden righting of unnatural conditions.

But if Col. J. W. Dawson it to be believed, that is just what is going to happen in West Virginia. In his address before the State Board of Trade at Fairmont he asked, "What would happen to the banks if $75,000,000 annually, or $250,000 daily, should be hereafter cut off?" The question is insincere, for no one believes, and certainly not Colonel Dawson, that the whole coal trade of West Virginia, east and west, is going to be utterly destroyed by an increased freight rate of 15c., or barely 10 per cent., which moreover affects only the western trade.

The new freight rate will not affect the New England business. It will not modify the condition of the bunkering market at Tidewater. It will not affect any of that European trade which West Virginia so cheerfully anticipates. In most places the only effect will be to increase the cost of coal to the consumer 15c.

In some places perhaps Ohio coal, securing by the new freight rate a larger price of 15c., or even a part of it, will be able to do business and compete with West Virginia coal, but for the most part the West Virginia people will add the freight to the cost of coal, and they should be grateful that they are allowed to do that. If they came to New York City like the anthracite operators, they would be apt to be told by the newspapers that increases of wages, of freight rates and of taxes and the imposition of new working conditions should not cause them to change the cost of coal one iota.

Col. J. W. Dawson alleges conspiracy, but the operators of the states which neighbor West Virginia, while not so ready to quarrel among themselves, are by no means so anxious to combine. There has been little enough unity among these operators, who have a common need. But when they went to convention and met the miners they told the latter that if the union compelled them to grant an increase the union must compel the West Virginia operators to be as generous. And the union promised to do so.

Such a demand is only right and just and no crime. The whole convention between miners and union is a like conspiracy; for do they not one and all declare that the changes in the agreement in one part of the unionized field shall be like those in every other?

It is stated by a press agency, which is spreading Mr. Dawson's remarks for the enlightenment of the public, that "Mr. Dawson also showed that if West Virginia could market her coal on as favorable conditions as Pennsylvania, the values of coal lands would grow from $100 to $200 per acre, their present values, to $1,500 to $2,000 per acre, the value that obtains in Pennsylvania."

Now there is no reason why a state remote from the market should be granted such rates as will put her on a perfect parity with another state having a market at the point of mining. The operator does not have a right to charge the same price for coal delivered to the merchant in Morgantown as he does to the dealer in New York. But overlooking that matter, the statement that coal land sells in Pennsylvania for $2,000 per acre is probably only true of part of one county. Little of it sells at any such figure. Much of it is selling for from $25 to $150 per acre.

Nor is it true that all the coal in West Virginia sells from $100 to $200 per acre. Some of it is held at even lower prices while some is not on the market at all. Some few years back a large area in the Pocahontas field could be leased only on paying a lump sum of $25 per acre for a lease, which conferred merely the right to mine coal for 15c. per ton. This coal had to be extracted according to a prescribed method, and as the seam was 10 ft. thick it could not fail to produce 15,000 tons to the acre. Thus the ultimate return per acre would be $2,275. So, after all, owing to the gracious consideration of the railroads by which the state has been developed, the conditions in West Virginia, despite its youth and geographical isolation, have not been unfavorable.

The average operator in West Virginia is like those in every other part of the Union. His notions of right and wrong are broadly based on justice and common-sense. He smiles and must continue to smile at the hotheads who misrepresent him. And indeed perhaps they smile altogether too much at men who do the State of West Virginia little credit by their unfair representation of its case.

The reputation of the state is worth something. When the word of the operators is once disregarded as a negligible thing, they will not be heard later, cry they never so lustily in their own defense. It is time that the sober-minded operators take a strong hold on the wheel and direct the campaign of the operators of the state along the lines of reason and self-respect.

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Mr. Foster Comments Upon the Consolidation and Expresses Appreciation to Friends

Practically every coal-mining man familiar at all with the fuel industries at large is acquainted, either personally or otherwise, with Rufus J. Foster, who has managed *The Colliery Engineer* for so many years. It is fortunate that the new and enlarged paper will have the good-will and frequent advice of Mr. Foster. It would be difficult to imagine the perpetuation of *The Colliery Engineer* without his name and personality closely linked with its conduct, no matter in what form that might be. Mr. Foster says:

RUFUS J. FOSTER

"The consolidation of *The Colliery Engineer* with *Coal Age* means the production of *one* superlatively good coal-mining periodical in place of two.

"It means that the former subscribers to both *The Colliery Engineer* and *Coal Age* will receive in one periodical all of the best features of the two papers. Thus there will be no duplications of articles on technical mining subjects or of other coal-mining information.

"It means to advertisers one medium filling the field formerly occupied by two, and that one medium reaching the entire field in the most desirable manner.

"While the consolidation means so much for both the subscribers and advertisers in *The Colliery Engineer* and *Coal Age,* I cannot help a feeling of sadness and sincere regret that the many years of pleasant relations that have existed between me and the friends of *The Colliery Engineer* are, to a certain extent, officially terminated; the only compensation being that I know the consolidation means a benefit to the patrons of both papers and that it allows me more time to devote to important duties as an executive officer of the International Textbook Co. and the International Correspondence Schools.

"While I shall not be officially connected with the new and enlarged journal, I will be in a measure connected with it in an advisory capacity and as a contributor, and I sincerely request that my many friends in the coal-mining industry will continue to give to Mr. Parsons, his assistant editors and the advertising representatives the same consideration that has always been extended to me and my assistants." RUFUS J. FOSTER.

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Mr. Young Continues His Editorial Connection

The new weekly that results from the combination of *The Colliery Engineer* with *Coal Age* will be represented by C. M. Young in the anthracite field. Mr. Young has been persuaded to continue his editorial work as an associate editor of the enlarged journal; thereby bringing to the consolidated paper all the experience, plans and incompleted effort that he has initiated in behalf of *The Colliery Engineer* in recent months. Mr. Young will concentrate his attention principally upon the hard-coal fields, which plan will afford the new paper better service than has ever been possible with either of the old papers singly. Mr. Young's good work on *The Colliery Engineer* made for him many strong friends throughout the country, and especially in the anthracite field. His ready understanding of editorial duties and his broad conception of this class of educational work leave no doubt that readers of the consolidated journals will profit by his editorial efforts. He says:

C. M. YOUNG

"The consolidation of *The Colliery Engineer* with *Coal Age* makes possible the publication of a coal-mining periodical which can satisfy the needs of everyone connected with the production and marketing of coal and coke.

"*The Colliery Engineer* was preëminently a technical magazine. Founded in the anthracite district of America, its interests had extended to all parts of the world. Now that it has been joined to *Coal Age,* its new publishers are entitled to the friendships that it had won, and the opportunities of the combined papers for service are greater than those of either alone and greater than the sum of these.

"I am personally glad to retain connection with the combined papers as the representative in the anthracite field. I hope that the friends of *The Colliery Engineer* will realize that the new publishers desire to retain their good will, that all that was good in either paper will be continued in the new form and that the new paper will serve them better than either of the old papers alone could do." C. M. YOUNG.

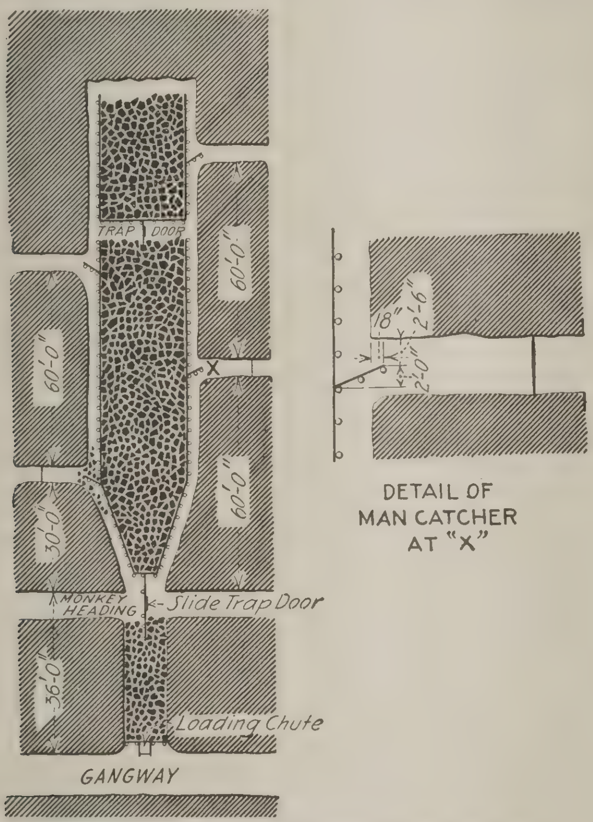
Sociological Department

Susquehanna's Safety Methods

By R. Dawson Hall

SYNOPSIS—The Susquehanna Coal Co. has, with gratifying results, carefully investigated all the conditions at its collieries with the intention of reducing accidents. Some of its methods are here detailed. Especially interesting is the "man catcher" for steep pitches.

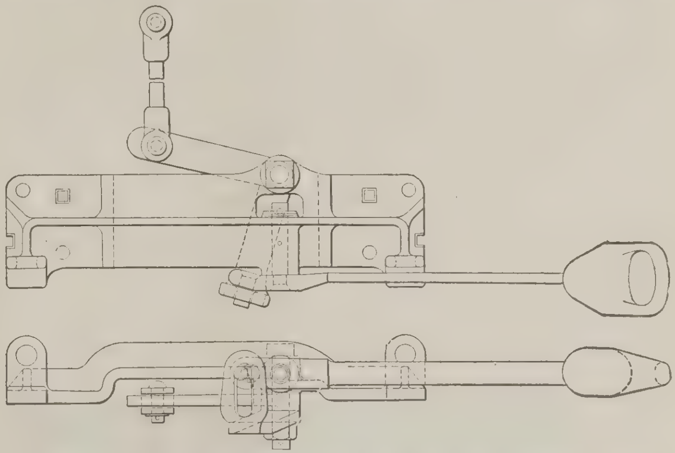
The Susquehanna Coal Co. has carefully utilized all its native talent to ascertain unsafe conditions in its mines, but it has not been content with this. It is well known that the coal company was formerly affiliated with the Pennsylvania R.R. Owing to this earlier connection it has been enabled to draw on the resources of the parent company, and in that way has been able to learn much that does not readily enter a mining company's experience.



MANCATCHER AND SAFETY BATTERIES

A company mining coal is duly impressed with its accidents from haulage and roof falls, but its men so rarely have eyes put out by flying steel or their clothes caught in gears or setscrews that matters of that kind get less consideration than they deserve. Still such accidents are liable to occur where there is unprotected machinery; and any superintendent from a large railroad shop would be sure to note such conditions, whereas a mine superintendent would be apt to be utterly indifferent. He could see the danger, but he would not have had the experience that would force the importance of the matter upon him. So the Susquehanna, desiring to find all the dangers possible and to learn as little as necessary from so expensive a teacher as experience, has sought to get all the light it could from people who are experienced in kindred lines and who have paid for their knowledge often in terms of human lives.

There is always a disposition to get mining men to criticize mining methods, whereas in the matter of machinery at least the outsider is often better qualified to throw an entirely new light on the problem of safety, both by his larger experience in the type of accidents to be avoided and by his acquaintance with other books and people. This new angle of view, or even an element of remoteness and lack of acquaintance with the dangers to be avoided, has its value. A man who has experienced any particular line of dangers repeatedly does not react as readily to them as one who sees them for the first time.



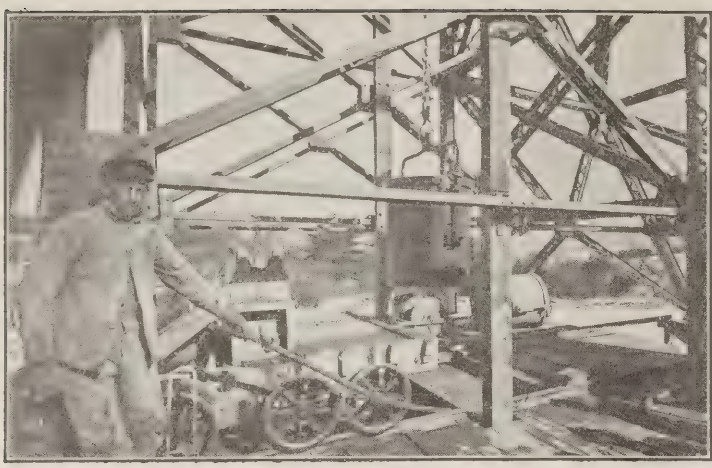
A SWITCH WHICH THROWS PARALLEL WITH THE TRACK INSTEAD OF AT RIGHT ANGLES

The investigation by all classes of experts has not been without actual results. The fatality rate has fallen from 32 in the first eight months of 1914 to 17 in the same period in 1915, or nearly 47 per cent.

Device to Protect Men Falling in Manways

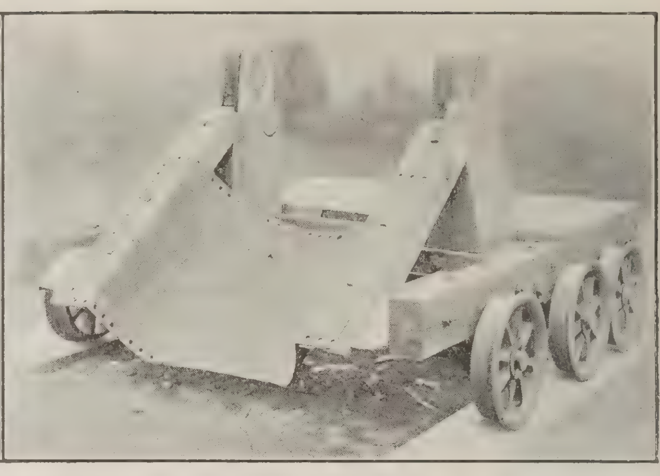
Among the new safety developments is one at Williamstown colliery in the Lykens division of the Susquehanna Coal Co. This is illustrated in this article. It is designed to reduce the seriousness of a fall down a steep manway and is called the "mancatcher." Another feature illustrated in the same plan is the "safety battery," which is placed every 100 ft. Mancatchers are built in at every crossheading, so that if a man falls he does not hurtle the full length of the battery, but only to the nearest mancatcher, which is located at the adjacent crossheading and is in no case over 60 ft. below him.

These mancatchers also protect the miner or laborer when he is traveling up the manway from anything which



SINKING BUCKET TRUCK AND SAFETY GATE AT NANTICOKE NO. 8

The safety cover is pulled over the shaft by the rope in the hand of the head tender



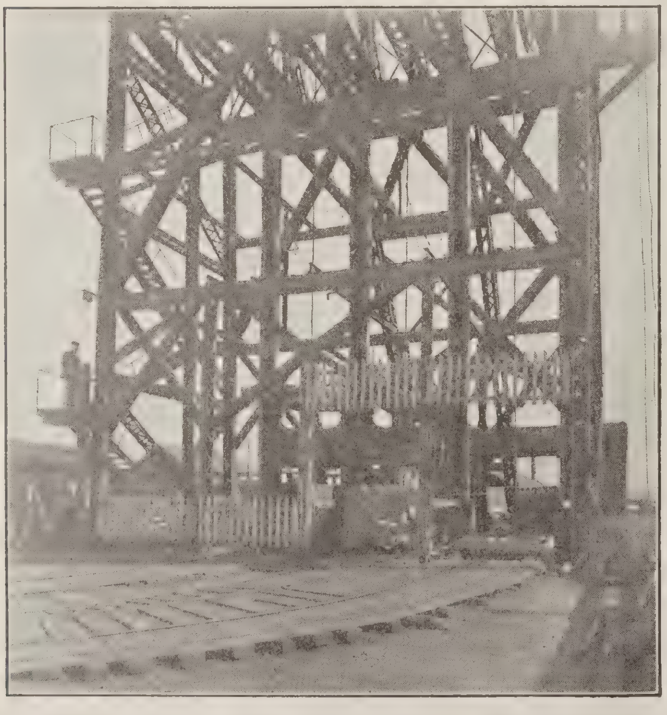
ANOTHER VIEW OF DUMPING TRUCK ON WHICH THE BUCKET IS LOWERED

The third wheel on each side spans the gap in the rails left for the shaft guides

may start to fall down on him. The mancatcher extends from the filled battery out 18 in. into the crossheading. This passageway is only 5 ft. wide, but the miner is readily able to pass around the mancatcher in climbing into his place. The device is simply constructed of three props which are planked from top to bottom.

The safety battery is placed every 100 ft. and is so contrived that if anything goes wrong a man can take a shortcut through the sliding trapdoor instead of traveling up to the face of every room in order to reach a place of safety. It is the end of the room which is most likely to be dangerous. Where there is the support of the broken coal, as in the center of the room, the danger is not so imminent as at the working face; so the trapdoor at every 100 ft. gives a real assurance of safety to every workman.

The company expects to reduce track accidents by using the switch stand illustrated herewith. In throwing the switch, as will be noted, the switchtender throws the lever in a direction parallel to the track instead of at right angles to it. Consequently, if he pitches forward in doing so, he does not fall over the rails, but alongside the track. He consequently does not run nearly so great a risk of falling into the cars and being killed.



SAFETY GATES AT HEAD OF SHAFT AT NANTICOKE COLLIERY NO. 7

They prevent the miners from entering cage from both sides of shaft

Care to Avoid Accidents in Shaft Sinking

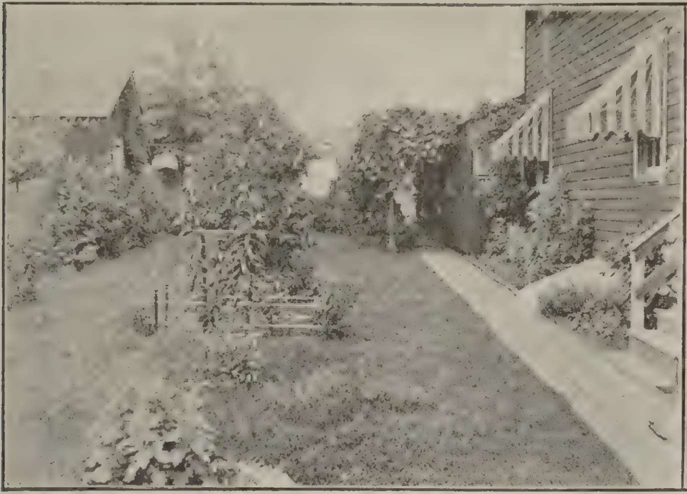
Shaft sinking has an unenviable reputation as a source of danger when the small number of men engaged in that work is considered. The fatality rate is high in percentage even though the actual loss of life from that source is not great. As a shaft in process of sinking is not a mine the records hardly reflect the fatality rate as they should.

The definitions of the law in many states relieve new shafts from the official visits of mine inspectors. New projects often do not employ the required number of men, they are not producing coal and therefore are not mines, and they are so remote that frequent visits to them would occasion much loss of time and the expenditure of much trouble. Hence, records of shaft-sinking accidents are probably not complete.

The Susquehanna Coal Co. has adopted many means for preventing these accidents at the new shaft No. 8 being sunk near Nanticoke at Nanticoke No. 7. There is always risk of a piece of rock or a tool falling on the men working at the bottom of the shaft. To prevent this a safety cover is pulled over the shaft opening by a rope, which in the illustration is being held by the head tender.

This cover is put in place after the bucket is lifted and before the safety truck is pushed into place. In addition there is another pair of safety covers under the one shown. The shaft is being sunk without the use of any naked lights, electricity being used exclusively for lighting. The reel by which the lights are raised and lowered can be seen under the hanging bucket. There are contacts on the side of the reel which provide a continuous lighting current in the system regardless of the length of wire that has been unwound.

The dumping truck for the shaft-sinking bucket is shown in another illustration. The bucket is hoisted high enough to allow the truck to be pushed under it. As soon as the shaft doors are closed the bucket is low-



YARD OF A SHAFT ENGINEER AT SCOTT COLLIERY WHICH TOOK FIRST PLACE

The award was made not only for the flowers and lawn shown but for the vegetable garden in the rear. John Moore, the tenant, is an employee of the Susquehanna Coal Co.

POSEY GARDEN OF FRANCIS SCHUCK, A MINER AT PENNSYLVANIA COLLIERY

Rear part of garden devoted to vegetables and poultry coops and kept in neat and sanitary condition. Second place was awarded.

ered, unhooked and pushed on the truck to the edge of the platform, where it can be dumped. The truck has three wheels on each side so that it can span the gap in the rails necessarily left for the shaft guides and the passage of the billy. The wheels are so disposed that the truck always rests on four wheels and is not tilted even when it is passing over the gap in the rails.

Safety Gates and Their Shrouded Counterweights

Another illustration shows the head of the shaft at No. 7 colliery, Nanticoke; and the reader has his attention called particularly to the safety gates which are placed so as to prevent men from getting on the cage from both sides of the shaft. They are thus obliged on entering the cage to pass by the head tender. The foreman on the left is pointing to the gaspipe guard surrounding the counterbalance weights which prevents the latter from injuring anyone should the counterweights break loose.

Excellent living conditions go hand in hand with safety. If a company's towns are undesirable places, the best men do not come to work in its mines and those that are there leave. The better element of citizenship is not present in a rough-and-tumble village to control the less amenable members of the community. For after all, the restraint of the good workingman on his fellow is worth all the company discipline which can be imagined.

GARDEN OF FELIX WITCOPSKI, A MINER AT LYTLE COLLIERY

This garden took third place, not because of its beauty but because of its great productivity

Probably reasoning partly in this manner the Susquehanna Coal Co. has encouraged gardens, and the towns no longer look like their former selves. The work is not done for money prizes, but competitions are held, and gardens are rated not alone for beauty but also for productivity. Some of the lost time of our colliery villages is redressed by the work done in the gardens, and many a wanton action is prevented because the gardening work consumes energies which have to find a vent somewhere.

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Accident Prevention and First Aid*

By H. S. Salmon†

SYNOPSIS—The author questions which is the more important, safety first or first aid, and whether the emphasis on the first of these should be laid on the education of the workman or on the provision of safeguards. He designates first aid as "picking them up as fast as they fall" instead of saving them from falling.

The ancients regarded lightning as a demonstration of the wrath of the gods whom they worshipped. They sought no further explanation, but piously put out the fire and repaired the damage done by the thunderbolt or, in the case of the early Romans, walled the place about and consecrated it to the god of lightning.

It has taken many centuries to turn the eyes of man from the effects of lightning to its cause, to prove its identity with electricity and to use that knowledge for the good of humanity. In other words, as regards damage from lightning, it has taken a long time to see that the lightning-rod and the fire department are the ounce of prevention and the pound of cure.

And in other similar matters the same misjudgment has been made. The results of accidents have made such a strong impression that they have overshadowed the causes. We are apt today to see similar events occur time after time before we associate them with a common cause. Safety organizations and individuals interested in safety must carefully guard against this error. In the conservation of men the study of the causation of accidents must certainly precede every other phase if we are to have any success in reducing fatality and accident rates.

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*Article read before the Alabama Safety Association, Birmingham, Ala., entitled "Accident Prevention and First Aid—Their Relative Importance."

†Safety inspector of ore mines, Tennessee Coal, Iron and Railroad Co.

Our problem is not short-lived, but is of as long duration as the occupations which we follow, and will constantly become more complicated with the development of machinery and with changes in methods. The advent of labor-saving machinery was met with violence and disapproval for fear it would displace the workman, but today he is as necessary as he ever was. It is vitally important, therefore, that we determine the proper lines of endeavor and classify them in the order of their importance.

How seldom when an accident happens do we give the result our entire consideration. Our attention is turned to the man who is hurt, and later perhaps to his needs or those of his family. We lose sight of the cause of the accident or, like the Romans, wall the particular spot about with a safeguard and consecrate it to the god of bad luck. Yet there still remains unsolved the problem of protection for the thousands of other men who must work in that mill or ride that train or go into that mine.

Safeguards in Mill; Education in Mine

To each of us safety first has a different meaning. We look at it in the light of the problems we are called upon to solve, but all safety problems have a great many elements in common. The principal factor of solution in the mine where conditions are constantly changing may be education; in the factory, where machinery and men have fixed positions, safeguards; yet education and safeguards are important in both places. What the other fellow has to contend with and how he does it is going to have a bearing on the general problem and will interest and broaden all of us.

The best way to determine which subject is the more important for study is to determine that which renders to the individual workman the more valuable service. Take the case of John Smith, a workman of average intelligence and with a number of years' experience. He does his work as he learned to do it. He has had first-aid instruction. In the course of his duties he passes by a piece of board with some nails protruding from it. He is in a hurry, and if he thinks of it at all probably says that he will not have to pass that way again. In this he is only human. How many automobilists, having safely passed such a board on the road, would return and throw it aside? Another workman follows Smith who is naturally less alert or perhaps has kept late hours the night before. He steps on the nails and is injured. Smith hurries him to the hospital, and in consequence the man is laid up for only a few weeks.

Later the management introduces a safety campaign, and Smith gradually becomes accustomed not only to noticing but to looking for and removing dangerous conditions. The other workman could follow him now without accident and has himself absorbed enough of the spirit of the movement to avoid dangers unconsciously. The result is that Smith is put to much less trouble in removing or reporting dangerous conditions than he was in taking his fellow-workman to the hospital. The fellow-workman not only does not have to suffer pain, but will in time be one of the army of Smiths who make things safer for the men who follow him.

Every accident is either the result of unusual conditions or the result of some irregularity such as carelessness, fatigue or stupidity within the man himself. The terrible mine explosion which now and again strikes the industrial world like a thunderbolt can often be traced to a careless or stupid miner coming in touch with abnormal gas conditions. When a man, careless, indifferent or untrained in safety, comes in contact with an unusual situation an accident is almost bound to happen. A plan of thorough safety education is the only lightning conductor which will make that contact without danger and without damage.

This paper does not attempt to answer the question as to the relative importance of first aid and safety first. It is merely intended to invite discussion of it. But if we are to have an ideal which we are going to strive to attain it must certainly be based on the principle that thorough and perfect preventive measures will eliminate the necessity of first aid.

The following poem from the "Travelers Standard" tells this same story so well that it is here given in full:

THE PARABLE OF THE DANGEROUS CLIFF

'Twas a dangerous cliff, as they freely confessed,
Though to walk near its crest was so pleasant,
But over its terrible edge there had slipped
A duke and full many a peasant.
The people said something would have to be done,
But their projects did not at all tally.
Some said, "Put a fence round the edge of the cliff";
Some, "An ambulance down in the valley."

The lament of the crowd was profound and was loud,
As their hearts overflowed with their pity;
But the cry for the ambulance carried the day
As it spread through the neighboring city.
A collection was made to accumulate aid,
And dwellers in street and in alley
Gave dollars or cents, not to furnish a fence,
But an ambulance down in the valley.

"For the cliff is all right if you're careful," they said,
"And if folks ever slip and are dropping,
It isn't the slipping that hurts them so much
As the shock down below—when they're stopping."
So for years, we have heard, as these mishaps occurred
Quick forth would the rescuers sally
To pick up the victims who fell from the cliff,
With the ambulance down in the valley.

Said one, in his plea, "It's a marvel to me
That you'd give so much greater attention
To repairing results than to curing the cause;
You had much better aim at prevention.
For the mischief of course should be stopped at its source
Come, neighbors and friends, let us rally;
It is far better sense to rely on a fence
Than an ambulance down in the valley."

"He is wrong in the head," the majority said;
"He would end all our earnest endeavor.
He's a man who would shirk this responsible work,
But we will support it forever.
Aren't we picking up all just as fast as they fall
And giving them care liberally?
A superfluous fence is of no consequence
If the ambulance works in the valley."

The story looks queer as we've given it here,
But things oft occur that are stranger.
More humane, we assert, than to succor the hurt
Is the plan of removing the danger.
The sensible plan is to safeguard the man
And attend to the thing rationally;
We should build up the fence and thus try to dispense
With the ambulance down in the valley.

Discussion by Readers

Valuation of Coal Lands

I want to thank Francis G. Welles for presenting in a different form a clear analysis of the operating figures used in my article published in *The Colliery Engineer,* September, 1915, p. 64, entitled "The Valuation of Coal Lands." Mr. Welles's objection to my manner of using these figures appears to be directed at the extension I have given to the usual definition of the term "profits." Mr. Welles states, in part, as follows: "There is only one state of affairs when interest on the investment may properly be charged against operating cost, and that is when a portion of the capital has been borrowed."

In the balance sheet under discussion I have simply carried this state of affairs a step farther and assumed that all of the capital has been borrowed. Such a state of affairs is by no means uncommon in the coal industry, although it seldom occurs at the beginning of operations. Later, when adequate production is assured, it happens with some frequency. However, if it had never happened, I think it would have still suggested itself to an engineer as a ready means of determining the commercial status of a given mining proposition.

The risks inherent in any coal-mining proposition demand profits in excess of the rate of interest current in the locality in which it is found, for the reasons set forth in the article. It is the excess with which my balance sheet concerns itself. While technically it shows only the profit of the *entrepreneur,* known as the operator in the coal industry, practically it shows and names as profit that portion of income without which the proposition is valueless. Profit is necessary, not only as a reward for the experience, enterprise and business sagacity of the operator, but as an inducement to capital to turn aside from investments that promise far greater security.

I think that, without impairing the value of the method to the engineer for trying out the working value of mining propositions, I may agree with Mr. Welles's contention that, as industrial operations are customarily financed, my balance sheet covers up some of the technical profits.

Pittsburgh, Penn. W. E. Fohl.

⁂

Handling Explosives in Mines

Letter No. 3—When reading the short editorial that appeared in *Coal Age,* Vol. 7, p. 937, inviting discussion by men of experience in the handling and use of explosives in mines, I concluded that this would make a very interesting and instructive subject:

Practice in the Cahaba Coalfield

Having had some years of experience in the handling of all kinds of explosives, I want to offer a few comments on the general practice of blasting coal in the Cahaba coalfield, in what is known as the "Eureka Basin," 18 mi. from Birmingham, Ala. Here, the main slope entries are driven to the full dip of the seam and water levels turned to the right and left off the main slope. The rooms are driven to the rise of these levels, on all inclinations from 5 to 75 deg.

The seam known as the "Helena seam" will average 4 ft. in thickness, and the general practice has been to shoot the coal off the solid, using black powder and fuse. Except in one or two places, squibs are not used to fire the shots. The miners claim that fuse works better, owing to the wet condition of the holes in this seam. The attempt to use permissible powder, in this seam, has only met with partial success. The miners claim that, first, it is too expensive and, second, it does not give as good results in breaking down the coal. Many of the operators also claim that, by the use of black powder, better grades of coal are obtained for domestic use. The mines load three grades of coal—namely, lump, nut and slack—the slack being much used for steam purposes.

System of Handling Explosives

The system adopted for the handling of explosives at the mine is as follows: The miner gets his powder at the magazine in the morning, from 6 to 7 o'clock. Each miner, before going into the mine, leaves his supply of powder at the tophouse, marking the powder with the number of his heading and room. The drivers deliver to each man his supply of powder, which is placed at once in his box, and the latter is locked. A miner is allowed to keep on hand only one keg of powder or one carton of stick powder. They make their own cartridges, using a stick 1½ in. in diameter for this purpose.

Blasting the Coal in Two Benches

The Helena coal seam is composed of two benches of coal, which are separated by a 4-in. parting. The bottom bench being the hardest and strongest coal, it is the general practice to shoot the top coal first. The work is carried forward, thus, in two benches or steps, the face of the top coal being kept a short distance in advance of the lower bench. The general practice in blasting the coal is to drill a hole not over 6 ft. in depth and so inclined toward the loose end that the shot will not measure over 4 ft. at the heel. At times, shorter holes are fired, depending on the coal to be broken down. Clay is furnished the men for tamping.

Bad Practices in Shooting Coal

There is a bad practice among heading men, who quite generally adopt what is known as a "cracker shot." The hole is drilled straight in the solid coal a distance of 6 ft. In some cases, two such holes are drilled one above the other, and this is known as a "double cracker." The coal is then mined or sheared 3 ft., leaving the other 3 ft. of the hole in the solid coal. When this shot is fired with "monabel" the coal that is mined or sheared is broken down, while the coal behind this is cracked by the explosion of the charge, which is located in the solid.

This practice, while dangerous, affords the miner easy cutting for the next shot. The mine inspectors have condemned the practice and are striving hard to bring about its disuse; but, as one of them stated to me not long since, it is difficult to enforce discipline in the mine. It is easy to see that if both the operators and the miners would take the precautions suggested by the inspectors, accidents resulting from blasting would be reduced to a minimum.

There is always danger of a windy or blownout shot when blasting coal off the solid, or whenever the powder is not given an opportunity to perform its work. Blasting off the solid requires the best judgment of an experienced miner, having a thorough knowledge and acquaintance with the kind of coal blasted, in order to avoid what is known as a "tight shot." An inexperienced miner will often increase the charge of powder, with the result that the shot blows its tamping or pulverizes the coal, producing much fine dust.

Another bad practice in this district is the firing of two or more dependent shots. It frequently happens that the second shot goes off before the first or the first shot may fail altogether. In either case, the result is almost sure to be a blownout shot.

Let me suggest the precaution of making up all cartridges outside of the mine, these cartridges to be carried into the mine in canisters. I would also recommend that every hole should be examined, charged and fired by a competent person. When miners charge and fire their own holes, they frequently tamp these with coal dust, which produces a large amount of flame when the shot is fired and burns up the oxygen of the air to such an extent that the place is unfit for work the next day. I have often had my light extinguished when examining a place owing to this practice of miners.

Maylene, Ala. ROBERT GIBSON.

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Efficient Mine Foremen

Letter No. 11—In discussing the efficiency of the mine foreman, the question should not be limited to his proficiency in the ventilation of a mine, as would appear from the first letters written on this subject. There are many other things that an efficient mine foreman must know that will measure his capability for filling successfully that position.

VENTILATION AND EFFICIENCY

It is true that good mine ventilation forms an essential part of the work of a successful foreman; but, however thorough the ventilation of the mine, if other important things are neglected, the foreman in charge could not be styled "efficient."

To illustrate this point, while district mine inspector I visited a small mine where the ventilation was very defective, owing to the neglect of necessary doors and brattices in the mine. The foreman in charge had been there but a few days and promised that he would improve the ventilation in a short time, which he did in a satisfactory manner. A little later I had occasion to call the attention of an operator of another small mine to the need of better ventilation and, in doing so, referred to the improvement that had been made in the mine I have just mentioned. The superintendent asked the name of the foreman who had made the change and, on being told, replied: "Yes, I know that fellow. He is certainly good in ventilation, but a complete failure in everything else connected with a mine." Later developments proved this to be the case.

A mine foreman may improve the conditions in regard to ventilation and at the same time permit the mine to become dry and dusty to a dangerous extent. Or he may look closely to the ventilation and keep the mine free from dust as well, but neglect his haulage roads and the drainage of the mine, until the output of coal is so reduced that the mine is no longer operated on a paying basis.

WHAT EFFICIENCY IN MINING MEANS

A good definition of the word "efficiency," in reference to the operation of a mine is the ability to accomplish what one undertakes and thereby reduce the cost of production. An efficient mine foreman is one who has attained a high average in all things pertaining to safety and economy in mining. In the operation of the mine the efficient foreman looks both to the interest of his employer and that of the men in his charge. He neglects no duties that pertain to his office and, as far as possible, permits no condition to exist in the mine that will endanger the life or impair the health of the men in order that the output of coal may be increased a few tons or the expense account reduced a few dollars. He is a close observer of what goes on in the mine, a student of conditions and a hustler. He is well qualified to deal successfully with the problems that arise.

FOREMAN NOT ALWAYS TO BLAME

In considering the high standard of efficiency required of mine foremen, we are prone to forget that many of his acts are directed by his superiors in office, in opposition to his own best judgment. The foreman is often adjudged inefficient because of the delay in making improvements that are greatly needed when, in fact, if the material was at hand and he was permitted to follow the dictates of his practical judgment, the needed work would have been performed and the conditions improved. In such cases it is the man higher up that should be censured and not the foreman.

I was pleased with Letter No. 5, by Thomas Hogarth, in which he urges the telling of the plain truth in answer to the questions of the superintendent or general manager in regard to conditions existing in the mine. This can be done in such a manner as to testify to the efficiency of the foreman. As a rule neither of these officials makes frequent visits to the mine, and consequently knows little of what is needed underground, except by the reports of the foreman and his assistant. The manager's aim and desire is to increase the production while decreasing the cost of operation.

A PRACTICAL ILLUSTRATION

Several years ago an inside foreman persistently pointed out to the superintendent of a certain mine the unfavorable conditions that prevailed in sections of the mine. The foreman insisted that these dangerous conditions should be arrested at once as a precautionary measure of safety. The general manager, knowing nothing of those conditions existing in the mine, was pushing the superintendent for a greater output of coal and a reduction in the cost of operation. The superintendent, not having the courage to inform the general manager of affairs existing underground, postponed from day to day the work recommended by the foreman and urged as necessary for the safety of the mine. The conditions grew gradually worse, and it is clear to every practical mining man that had this superintendent made plain to the general manager the necessity of making the changes needed, even though the work should curtail the output of coal, the disaster that occurred in that mine later would have been averted and lives would have been saved.

JOHN ROSE,
Dayton, Tenn. Former District Mine Inspector.

Gaining a Maximum Tonnage

Letter No. 1—In working out the problem of securing a maximum output of coal per ton per man, the coal-sheet on the tipple is a good starting point. For instance, note the check numbers of the loaders who put out less than the average number of cars on the preceding day. Then go into the mine and ascertain from each of these men the reason why he loaded less coal than the average the previous day.

By extending these inquiries in this manner over a period of several months and arranging the reasons given for loading less coal, it will be found that these can generally be classified under the following heads: (1) Cars come too slow. (2) Place not cut by machine. (3) Track not fixed in room. (4) Bad air and smoke. (5) Place working badly. (6) Quit on account of sickness.

SLOW DISTRIBUTION OF CARS

Delay in getting cars to the working face for loading may be owing to a number of different causes, such as poor roads, balky mules, incompetent drivers, a poorly arranged system of haulage, rooms widely scattered, motor troubles and derailment of cars. When everything is working properly underground, the delay may be owing to congestion on the sidetrack or at the shaft bottom because of a cessation of dumping at the tipple owing to lack of railroad cars.

Most of the causes mentioned can be eliminated by proper attention on the part of the mine foreman and his assistants, whose duty it is to see that the roads are in proper condition, that good rolling stock is mantained and that good mules, competent drivers and motormen are employed. If the work of the drivers is scattered over a considerable territory, this can generally be avoided by giving proper attention to the turning of rooms off the headings, in such a manner as to provide a sufficient number of places to keep a driver busy on one entry or pair of entries.

Where it is necessary to work the entries back on the retreating system, the first rooms can be turned and worked up a short distance, when the miners from these places are shifted ahead as quickly as the entries are advanced sufficiently to permit new rooms to be turned. In this manner, a sufficient number of rooms can always be kept working to keep one driver busy on a single entry or pair of entries. Special attention should always be given in the development of a mine to the consolidation of the work.

WORK OF THE DRIVERS

There is great need of systematizing the work of drivers in a mine. The driver works by the day, while the loader is paid by the ton or the number of cars loaded. As a result loaders generally finish their work and quit the mine before it is time for the drivers to leave. This gives the drivers a chance to clean up the coal and to distribute the empty cars in the rooms, ready for loading in the morning. It frequently happens, however, that there is a disposition on the part of drivers to leave this work to be done in the morning, which causes much delay in making a start the next day.

To insure a good day's run, there should be plenty of coal on the bottom or at the tipple ready for dumping when the whistle blows in the morning, and each miner should have his supply of empty cars at hand ready for loading when he enters the mine and proceeds to work. It will often be difficult for a foreman to enforce this system, inasmuch as he is busy on top getting things started and cannot enter the mine for an hour or more in the morning. He must therefore delegate this work to the boss driver or other assistant and hold him responsible for putting the coal on the bottom in time for hoisting each morning. As mine foreman I have made many trips through the workings after hours to satisfy myself that the drivers were doing their duty and that the empties were placed ready for loading in the morning.

WORK OF THE LOADERS

The loader generally has his little whims, which it is better perhaps to respect than to attempt to analyze for correction. He likes to start early and load his coal rapidly, and any delay in getting cars breaks the charm, and his work is then done in a half-hearted way, with the result that he quits early, determined to get a better start the next day.

Again, nothing is gained by overloading a driver by putting more men on his run in hopes of increasing the number of cars hauled. A foreman should know how many cars a good driver can haul on his run in a single shift, and this should limit the number of men that can work in his territory and give satisfaction all around. Overloading a driver's run will generally produce confusion and interfere seriously with the systematic hauling of the coal, and this in turn will affect and dissatisfy the loaders, who will cease to put out their regular supply of coal. What I have said about the charm under which the loader works may seem pure sentiment to many, but it is nevertheless the deep philosophy of the men who load the coal at the working face. Attend, therefore, to the placing of the first car in each room in the morning.

WORK OF CUTTING THE COAL

Where the coal is cut by machine, it is important that each miner should square up his place ready for the machine-runner. If this is not done, the loader is very apt to find his coal is not cut when he comes to work the next day. A machine-runner who cuts coal by the ton or car will give the most attention to those places that are properly squared up and ready for cutting. The best results are obtained when every loader understands the importance of being ready for the machine. Many loaders give this matter little or no attention. Instead of arranging their work accordingly, they will continue to load all their loose coal until the last car is loaded, before starting to square up in readiness for the machine.

WORK OF THE DAYMEN

Although contrary to the modern policy of division of labor, it will frequently be found of advantage to have a crew of daymen available for any kind of work that may be required of them, from laying a track to driving a mule. It is possible for loaders to devote much of their spare time to cleaning up the track in their rooms and repairing it when necessary, which would be to their own advantage as it would facilitate the movement of the cars in and out of the rooms. By so doing, men can do much to increase their regular daily output of coal. A working place is not in good shape when it requires handling the coal two or three times before it can be loaded into the car, because the track does not reach the face of the room.

Again, in the operation of every mine there are good and bad places, and the mine foreman often finds it expedient to make allowances in the working of hard places. The best of judgment is required in doing this, in order to treat all men fairly and with equal justice. The bad places must be worked, and it is often better policy to pay a good miner something extra to work the place than to give it to a less experienced miner or the last man on the job. In my opinion it is a bad policy to put a newcomer into the worst place in the mine. These men should be given an even chance with the old loaders, in order to secure permanent recruits and maintain a good force of loaders that will be always available when conditions require.

There is a certain knack in shoveling coal, and it will be found worth while to employ an experienced man whose duty it will be to train green loaders and to show them how to handle a pick and to shovel coal. A good loader can handle a pick or shovel equally well in either hand. He knows how to use both his back and legs when shoveling, instead of doing all the work with his arms. Such a training as I mention here will develop a good class of loaders who will be able to mine and load more coal in a day than is possible without such training.

The course of training should include the location, drilling, charging and firing of shotholes so as to produce the best results. I have seen men who weigh not over 125 lb. load eight 2-ton cars of coal by 4 o'clock and be ready to do the same thing the next day. I have seen other men, husky fellows, who were hardly able to finish loading six cars because of their inexperience in the handling of pick and shovel.

Digging is an important part of the work of the loader. All cutting machines leave a bottom coal to be taken up, and no shot brings down all the coal. For this reason, the work must be squared up as the face is advanced, and made ready for a new cut with the machine. The loader must be trained and shown the best manner to perform all this work.

GEORGE STOCKDALE.

Mt. Braddock, Penn.

Study Course in Coal Mining

By J. T. BEARD

The Coal Age Pocket Book

The Year—A year is the period of time in which the earth completes one revolution in its orbit.

The **solar year** (365 d., 5 hr., 48 min., 45.51 sec.) marks a complete revolution about the sun.

The **sidereal year** (365 d., 6 hr., 9 min., 8.97 sec.) marks a complete revolution with respect to a fixed star.

CIRCULAR MEASURE

60 seconds	= 1 minute	
60 minutes	= 1 degree	3,600 seconds
15 degrees	= 1 hour angle	900 minutes
30 degrees	= 1 sign	1,800 minutes
12 signs	= 1 great circle or circumference	360 degrees

The **"sign"** is one of the twelve divisions of the zodiac, which correspond to the twelve calendar months of the year. The sign has no practical value technically.

It is often convenient to express the length of an arc, or the angle it subtends, in terms of the radius of the circle. In that case, the unit of length is called a "radian." A **radian** is a length of arc equal to the describing radius. Its value expressed in degrees is $180° \div \pi = 180/3.14159 = 57.2958$ deg., or $57° \, 17' \, 44.88''$. Since the length of the circumference of a circle is $2\pi r$, there are 2π radians in a circumference or 360 deg.

Circular measure is used in the measurement of angles and in the estimation of **latitude, longitude** and **solar** or **sun time,** which varies from **standard time** according to the location of the observer.

Measurement of Time—The passing of time is measured by the revolution of the earth on its axis, as determined by the observation of the sun or one of the fixed stars when crossing the meridian of a place. A single revolution of the earth marks a period of 24 hr. or one day.

Sun Time—Owing to the inclination of the earth's axis to the plane of its orbit and the eccentricity of the orbit, the sun's apparent motion in the celestial sphere is not wholly uniform, on which account **solar time** is referred to a "mean **sun"** having an assumed uniform motion.

Equation of Time—The difference between the mean sun and the true or observed sun, expressed in hours, minutes and seconds, is called the "equation of time." This is found for any date in the "Ephemeris" or Nautical Almanac.

Sidereal Time—The apparent movement of the fixed stars, unlike that of the sun, is uniform, which makes the sidereal day correspond precisely with one complete revolution of the earth on its axis. About Mar. 21, or at the vernal equinox, sidereal time agrees with mean sun or solar time.

Local Time—When the 24-hr. cycle is referred to the local meridian as zero (noon or midnight) the indicated hour is the local time, or the time for that place only. Since there are 360 deg. in a circle, which marks 1 day or 24 hr. of the celestial equator, 1 hr. corresponds to $360 \div 24 = 15$ deg. Hence, a difference of 15 deg. marks a difference of 1 hr. in local time.

The Coal Age Pocket Book

Longitude, Latitude—Longitude is the distance either east or west of the **meridian of Greenwich,** which is marked by the Royal Observatory, and measured in degrees, minutes and seconds, on the equator. There are thus 180 deg. of **east longitude** and 180 deg. of **west longitude.**

Latitude is likewise distance north or south of the equator, measured in degrees, minutes and seconds, on any meridian or great circle passing through the poles. There are thus 90 deg. of north latitude and 90 deg. of south latitude.

Standard Time—To obviate the confusion caused by the difference in local time, a system of "standard time" has been adopted. Starting from the meridian of Greenwich, standard time is 1 hr. later for each 15 deg. of east longitude, and 1 hr. earlier for each 15 deg. of west longitude. Calling the equatorial circumference of the earth 25,000 mi., a degree of longitude represents a distance on the equator of $25{,}000 \div 360 = 69.4$ mi. Hence, 1 hr. (15 deg.) corresponds to a distance of practically 1,000 mi. at the equator.

In the United States and Canada, there are four divisions of standard time, known as **Eastern, Central, Mountain** and **Pacific time,** which are exactly 1 hr. apart. These are all referred to the observatory at Greenwich, which marks the zero of longitude.

Eastern time is the solar time of the meridian 75 deg. west longitude, and is the standard time for all places within 7½ deg. on either side of that meridian. Eastern time is therefore $75 \div 15 = 5$ hr. earlier than Greenwich time.

Central time is solar time for the meridian 90 deg. west longitude, and is likewise standard for all places within 7½ deg. east or west of that meridian. Central time is 1 hr. earlier than Eastern time.

Mountain time is solar time for the meridian 105 deg. west longitude and standard for all places within 7½ deg. east or west of that meridian. Mountain time is 1 hr. earlier than central time.

Pacific time is solar time for the meridian 120 deg. west longitude and standard for all places within 7½ deg. east or west of that meridian. Pacific time is 1 hr. earlier than mountain time.

When it is noon at the observatory at Greenwich it is 7 a.m. at New York, 6 a.m. at Chicago, 5 a.m. at Denver and 4 a.m. at San Francisco. At the same time it is 1 p.m. at Berlin and Rome, 2 p.m. at Petrograd and 8 p.m. in the Philippines.

Civil Time—The day, for all common purposes of reckoning, begins and ends at midnight. The 24 hr. are divided into two periods of 12 hr. each. The hours from midnight to noon are designated by the letters a.m. (ante meridian), and those from noon to midnight by the letters p.m. (post meridian).

Astronomical Time—The astronomical day is reckoned from noon to noon, the hours being counted from 1 to 24. The astronomical day begins 12 hr. later than the civil day, as the following comparisons will show:

Civil time,	Nov. 6, 3 a.m.;	Nov. 6, 3 p.m.;	Nov. 7, 3 a.m
Astronomical time,	Nov. 5, 15 hr.;	Nov. 6, 3 hr.;	Nov. 6, 15 hr

Inquiries of General Interest

Flow of Water in Pipe Line

A horizontal pipe line having a diameter of 12 in. gradually reduces in cross-section to a diameter of 3 in., and then increases gradually to its original size. The water has a velocity of 5 ft. per sec. in the larger section of the pipe. I would like to ask, Neglecting friction, how does the pressure vary along the axis of this pipe? Also, does this reduction of sectional area affect the flow of the water in the pipe or reduce the quantity of water that will be discharged under the same head?

CONSTANT READER.

Mountain Park, Alberta, Canada.

Assuming a full flow of water in a pipe line under a constant head, a gradual reduction in the sectional area of the pipe, followed immediately by a gradual enlargement to the original area, will not materially affect the flow of water in the pipe. The velocity of the water at any point will vary inversely as the sectional area, or inversely as the square of the diameter at such point. In other words, the velocity ratio is always equal to the square of the inverse diameter ratio, which in this case is $(\frac{12}{3})^2 = 4^2 = 16$.

As shown in the accompanying figure, the velocity of the water at the throat, where the diameter of the pipe has been reduced to 3 in., is 16 times the velocity in the original section of the pipe.

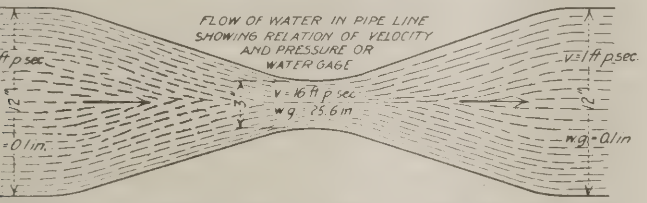
FLOW OF WATER IN PIPE LINE SHOWING RELATION OF VELOCITY AND PRESSURE OR WATER GAGE
v·1 ft p sec.
v=1 ft p sec.
12"
3"
12"
v=16 ft p sec
wg. 25.6 in
wg=0 1 in.
wg.=0.1 in

DIAGRAM ILLUSTRATING FLOW OF WATER IN PIPE

But in the flow of a fluid through a conduit, the pressure at any given point varies as the square of the velocity of the flowing medium. Hence, ignoring friction, the pressure at the throat of the pipe in this case is $16^2 = 256$ times the pressure in the original section before the reduction of area took place. This is in accordance with the principle of the well-known Venturi meter. There is practically no loss of energy owing to the contraction of the vein, providing the decrease and increase are gradual. The pressure head being converted into velocity head and *vice versa*.

Pittsburgh Coal Prices in the Cleveland Market

I have sometimes wondered why your Cleveland market report quotes Youghiogheny, while Pittsburgh quotes the "Pittsburgh district." Pittsburgh district includes Youghiogheny, as well as Monongahela, nearly to Brownsville. Cleveland could quote the larger district, because it is made by the railroads with a uniform freight, except of course that Youghiogheny coal is different in quality from Monongahela. I admit this is true to an extent, but I doubt whether a definite price difference exists, except sometimes in slack coal. The physical difference is that the Youghiogheny runs more as a gas coal and the other more as steam coal. As the freights are the same, the mining rate the same and there is always more coal mined everywhere than needed, the market has hardly any opportunity to establish a difference in price.

Pittsburgh, Penn. B. E. V. L.

The reason that Youghiogheny is quoted in preference to Pittsburgh district is because Youghiogheny is the standard western Pennsylvania coal in the Cleveland district. Some Pennsylvania steam coal comes in over the Pennsylvania Pan Handle and is known locally as "Pan Handle" coal. There is a small trade for Youghiogheny, mine-run and slack. There is a little domestic trade and a good lake trade. Youghiogheny is the standard lake fuel.

Fairmont coal is better known and more extensively used there than Pennsylvania bituminous coals. When the market is down, the West Virginia operators will underbid the western Pennsylvania producers. In a low market there is a good deal of Youghiogheny slack sent there, and some Pan Handle. The latter usually sells at five to ten cents less than the gas coal and is treated on the same basis as No. 8, which it very closely resembles.

Motor Trouble

I have had considerable trouble in the operation of a mine motor and would like to ask if you can explain the difficulty and tell me how to remedy it. The motor appears to get too much power when the controller is on the first point, which causes it to burn out.

Homer City, Penn. J. M. CONRAD.

The trouble is probably due to the motor being "hooked up" improperly; that is to say, the connections in the wiring are wrong. This is easily remedied by anyone having sufficient intelligence to investigate the matter. If the system is not thoroughly understood, however, a diagram of the wiring can be obtained from the makers of the machine.

The fact is there is not sufficient resistance in the circuit when the controller is on the first point, and as a result too much current flows through the motor before the latter has picked up speed sufficient to generate the required amount of counter-electromotive force, which takes the place of the resistance after the motor has attained its full speed.

It is important to always protect the circuit by fuses, so that in case anything is wrong in the connections, it will not result in burning out the motor, which will be prevented by the melting of the fuse and the consequent breaking of the current.

Examination Questions

Miscellaneous Questions

(*Answered by Request*)

Ques.—Explain by means of a sketch the proper arrangement of a blowing fan and its connection with the downcast shaft, assuming the mine is generating gas and a possible explosion may destroy the fan.

Ans.—As shown in Fig. 1, the fan should be set back a suitable distance from the top of the shaft, which is surmounted by explosion doors opening upward and designed to relieve the pressure owing to the explosion and thus prevent the destruction of the fan. As shown in the figure, the fan wheel is surrounded by a spiral casing that expands regularly from a point a short distance from the cutoff *c*. From *c* to *b* the casing is concentric with the fan wheel, the expansion starting at *b*. The distance *cb* must not be less than the distance between two consecutive blade tips, in order to prevent the back-lash of air at this point.

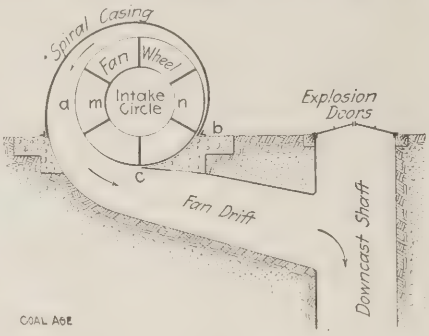

FIG. 1. SHOWING POSITION OF FAN

Atmospheric air enters the fan by the intake circle, and passing through the compartments between the blades, flows around the fan in the direction of rotation, as indicated by the arrows. The curve of the spiral casing is continued on the floor of the fan drift, which has a slight inclination toward the shaft. The center of the fan should be set back about 50 ft. from the shaft. The fan is partly sunk in a pit lined with concrete walls, which furnish a good foundation for the fan and the building or fan house.

Ques.—Are you in favor of the use of mixed lights in a mine where explosive gases are generated? Give full reasons.

Ans.—No. Where safety lamps are required to be used in certain portions of a mine generating gas, with a few possible exceptions where the two portions of the mine are widely separated, thereby affording ample protection against the gas finding its way from the section in which it is generated into the other section of the mine, the entire mine should be worked exclusively on safety lamps. The reason for this is the ever-present danger that in the operation of the mine an open light may find its way into the gaseous section of the mine; or the gas generated in that section may be forced back into the other section of the mine by reason of a local explosion in the first section, or by an unprecedented fall of roof in that section, or by the setting open of the division doors and the consequent disarrangement of the ventilation. Again, the fact that gas is generated in these measures makes it possible that gas may be generated in those parts of the mine where it has not previously appeared. This may occur at any time and perhaps because of a general subsidence of the roof formation or as a result of a squeeze or creep extending more or less throughout the mine. These reasons are sufficient to require the exclusive use of safety lamps in a mine any portion of which is generating gas in such quantities as to require their use in other parts of the mine.

Ques.—How often is it desirable that a boiler should be cleaned?

Ans.—The frequency of cleaning a boiler will depend upon the purity of the feed water used. It is important that boilers should be cleaned at regular intervals. In the great majority of cases, the cleaning of the boiler should not be delayed for a period longer than one week, and in many cases more frequent cleaning is necessary.

Ques.—What is a steam separator, and why is its use desirable?

Ans.—A steam separator is an arrangement or device for separating the entrained water from the steam before the latter is permitted to pass into the cylinder of the engine. The use of a separator provides comparatively dry steam and prevents the accumulation of water in the steam line and the cylinder. When water is permitted to accumulate in a steam cylinder, there is danger that the cylinder head may be knocked out by the movement of the piston to and fro in the cylinder, the water being incompressible.

Ques.—Describe the process of forepoling used in driving a heading under a tender roof in a mine.

Ans.—This system is shown in Fig. 2. The props *A*, *B* and *C* are set at regular intervals as the heading is advanced. In order to prevent the frail roof from falling between the timbers, flat spiles *a*, *b* and *c* are driven in consecutively over the last collar set next to the face of the coal. These spiles are formed of 2-in. planks 8 or 10 in. wide and sharpened at one end to facilitate their driving. The figure shows the manner in which the spiles are driven up in order as the face advances.

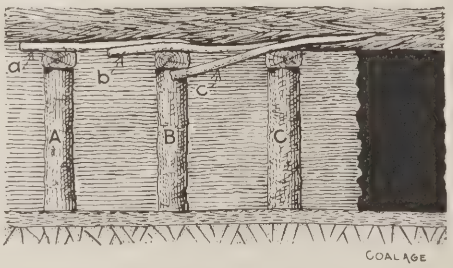

FIG. 2. METHOD OF FOREPOLING

Ques.—What is the chief thing to be remembered while wearing an apparatus?

Ans.—Your own safety and those that are with you; also, that men caught in a mine explosion or fire should not be considered as dead until life is found to be extinct. It is important to note constantly that the apparatus is working properly and that the supply of oxygen remaining is sufficient to enable you to make good your escape to the surface, making due allowance for unavoidable delays.

Book Reviews

Book on Smokeless Combustion

COMBUSTION AND SMOKELESS FURNACES. By Joseph W. Hays. Pp. vii + 116 + 2 index; 6¼x9¼ in.; 21 illus. Second edition (revised). Joseph W. Hays, publisher, Rogers Park, Chicago. Cloth boards, $2.

Remembering a lively little book on a similar subject entitled "How to Build Up Furnace Efficiency" written by the same author and reviewed in the issue of "Coal Age" of Nov. 14, 1914, the reviewer expected much pleasure in the perusal of the volume about to be discussed. The book being reviewed makes more pretentions than the other, but is disappointing for one cannot but realize that Mr. Hays is at his best in the furnace room and not so much at home when he begins to discuss chemistry and thermodynamics as abstract sciences, as he endeavors to do in parts of the present volume.

The first of all his difficulties is his wrong conceptions about the "absolute zero." This point on the thermometric scale is purely an abstraction, about as dependable as the point on the chronometric scale once volubly pointed out by a conductor on a "tin lizzie" street car plying between St. Johns Place and Borough Hall in Brooklyn. The happy Teuton who presided over this pretentious vehicle was dancing round the post which serves to operate the doors and hold the nickels and was joyously proclaiming—this was in August a year ago—that in five days the Germans would be in Paris.

Now he had every reason to figure that given a continuance of the phenomena which were up to that time apparent the Germans would enter Paris in five days, but he overlooked some countervailing conditions, and only a few days afterward it looked as if in a month the Allies would enter Berlin, which indication also failed of realization.

ABSOLUTE ZERO ONLY AN ABSTRACTION

It is somewhat similar with the absolute zero. The phenomena around ordinary temperatures point unerringly to a certain conclusion, but when lower temperatures are reached, the countervailing conditions modify these phenomena considerably. It appears that at 0 deg. C. a gas shrinks 1 part in 273.7 for every decline of 1 deg. C. and that the denominator 273.7 should be increased by adding the scale temperature to obtain the contraction per degree Centigrade at any other normal temperature.

It is extremely easy to fall into the error of believing that as this is true for all perfect gases and for reasonably large ranges of temperature it is true to the limit so that a gas will be without volume whatever at —273.7 deg. C. As the gas has shrunk to nothingness it can have no molecular motion and hence no heat and the temperature attained has accordingly been termed the absolute zero. But no thinking man ever believes gas so retiring as to dissolve into nothingness, and no one ever had any right to proclaim this point an absolute zero; for if the gas ceased to exist, it could have no temperature, and if it continued to exist, there was nothing to prevent a belief in a still lower temperature. In fact, the so-called "absolute zero" has been reached within a few degrees since the concept was first put into writing, and there is no evidence at such low temperatures that the law of shrinkage holds good or that there are not profounder temperatures yet possible in both theory and practice.

But we are troubled to know what to say, for after all what does Joseph W. Hays really mean? On page 3 he says, "There is no point strictly speaking when heat ceases and cold begins," and on page 4, he declares that "at this point [that at which he suggests that motion is at an end] what we call cold ceases—it cannot get any colder—and heat has its origin or beginning. This point has been definitely fixed by scientific calculations. It is 273.7 deg. below the zero of Centigrade. It is known as the absolute, or true, zero of heat energy." So on page 3 he tells us that there is no point at which heat begins, and on page 4 assures us that there is such a point. Both statements cannot be correct. Which guess is the right one no one knows, but certainly —273.7 is not that limit. It is nothing but a convenient basis for figuring.

On page 7 of the book which is being reviewed is to be found the veriest piece of spreadeagle Americanism: "Many of the highest authorities in physics and many of the American schools have adopted the Rowland determination [of the mechanical equivalent of heat], while others adhere to the final figures given by Joule." There is nothing objectionable so far; but then follows: "The Joule unit is generally accepted in Great Britain, and it would accordingly seem consistent to follow the British standard or cease reckoning in 'British thermal units' and adopt a unit of our own. As the Rowland experiments were conducted at Baltimore, it would be easy for those who prefer the Rowland figure to substitute 'Baltimore' for 'British,' and thus, while not abandoning the abbreviation 'B.t.u.' make plain what they mean when referring to a thermal unit."

BALTIMORE THERMAL UNITS NOT NEEDED

A remarkable suggestion and one which would be worthy of some consideration if we were accustomed to conduct our calorimetric investigations by finding what work a pound of fuel would do and if we then determined by the Joule or the Rowland mechanical equivalent the number of thermal units generated. As a matter of fact we do no such thing. We take the coal, burn it and see what heat it develops, and if Joule and Rowland were 100 per cent. wrong in their determination, the number of thermal units credited to a pound of fuel would not be one more or one less. For your information, Mr. Hays, the word "British" applies to the pound and to the Fahrenheit degree and not to the mechanical equivalent of heat, the people of the United Kingdom and of this country also being unfortunately wedded to these undesirable units, though of course the latter monstrosity hailed from France. To their credit the French people knew enough to take up with a somewhat better unit introduced by a Swede.

After all, when we now use "British thermal unit" and "calorie," we rarely refer to the pound or the gram at all; for the water raised 1 deg. Fahrenheit or Centigrade, as the case may be, is usually figured in like units to those used to measure the fuel burned.

Perhaps it might be as well to replace the term "British thermal unit" by "Fahrenheit thermal ratio," for when we say that a coal gives 14,000 thermal units we mean that a unit by weight of that coal will raise 14,000 units by weight of water 1 deg. Fahrenheit. The unit of weight, whether ounce, pound or ton, is not considered. It is not a number of units which we have, but a factor; and when we want calories in place of British thermal units, we pay no attention to the relative size of the gram and pound, but divide by 1.8, the ratio of the units in the thermometric scale. So after all, "British" is a misnomer and "Baltimore" a still greater folly.

SUMMARY OF THE SUBJECTS TREATED

Having done what a censor of technical books should do before they are published, if he had the time to do it, it is necessary to say something about the book itself, which it must be confessed is far better than the extracts just quoted. It commences with "Heat and Combustion" and then discusses "Combustion and the Boiler Furnace." Very clearly Mr. Hays shows that the work of the furnace is separate from that of the boiler, and he treats the relation between combustion and its calorific effect in another chapter.

In the "Chimney Evil," he deals not with smoke so much as with the carbon monoxide which is in that smoke. The generation of this monoxide is a greater cause of the inefficiency of a furnace than is the generation of dense smoke, and the author suggests that the diffusion of the monoxide through the air may do more harm than fuliginous clouds of soot.

Then he discusses all the failings of different classes of furnaces, both mechanical and hand-fired, and none of them escapes scathing criticism. Be it understood, however, that he speaks always of types and not of specific makes, and being generalizations his descriptions of the methods of operation and application are sometimes not as clear as one might wish. The illustrations are the merest sketches, exhibiting boiler settings rather than grates.

Still the reader will find much sterling wisdom, for Mr. Hays is an extremely practical engineer with an original point of view and firm convictions. In the final appendix he discusses as a sort of afterthought flue-gas analysis, the effect of soot in preventing radiation of heat and the use of soot cleaners in water-tube boilers. Mr. Hays is never uninteresting; he is always practical, and his book cannot fail to be of great profit.

Coal and Coke News

Harrisburg, Penn.

The anthracite coal tax of 1913 was declared unconstitutional by the State Supreme Court on Oct. 28, and as a result the state will lose nearly $10,000,000 in taxes. The opinion, written by Justice Stewart, reverses the decision of Judge Kunkel, of the Dauphin County Court, rendered several months ago, the local jurist holding the act constitutional and valid.

The act, which levies a 2½ per cent. tax on anthracite coal mined, was operative for two years, or from July 1, 1913, to July 1, this year, when it was supplemented by the Dawson Act of 1915, which provides a similar tax, but provides that instead of dividing the tax among all the municipalities of the anthracite region, the tax shall be split 50-50, the state sharing with the municipalities that produce the fuel.

Coal companies from the start opposed the imposition of the tax and hundreds of appeals from the settlements of Auditor-General Powell were filed in the Dauphin County Court. The conclusion reached by Judge Kunkel, however, was based on the case of the Alden Coal Co. involving the collection of $7,792.76, due for the six-months period from July 1 to Dec. 31, 1913.

Judge Kunkel in his opinion held that the act was crudely drawn in that there was no express requirements that the operator shall pay the tax.

Only $20,000 has been paid into the state treasury by the anthracite coal companies under the act, and all of this under protest. This money will probably be returned by a special act of the next legislature, but there is no possibility that the $9,000,000 or more collected by the coal companies can be paid back to the consumers. It is said on an average of 10 to 15 cents a ton was charged by the operators to cover the amount of the tax. Under the coal tax act of 1915, the collection of the tax under the act of 1913, expired July 1, this year, so that the excess charges of the coal operators covered a period of two years.

Justice Stewart's opinion was not unanimous, for Justices Porter and Frazer dissented. In reversing the Dauphin County Court, Justice Stewart said in part:

> "When the necessary effect of the legislation is to create inequality of burdens as we here see it, are those complaining of the injustice to receive no other answer than that while the constitution promises them equality in the matter of taxation, that because it failed to place restriction upon the legislature's right to distribute the tax it collects, that therefore the purpose of the legislation is not to be inquired into? If constitutional requirements are to be circumvented by such simple and easy process of reasoning, the question may yet be asked derisively of the constitution, 'What is all this worth?' "

Just what effect the decision will have on the 1915 act is not known, although it is said that the latter may be declared unconstitutional.

So far no settlements under the 1915 law have been made, but many of the coal companies have protested against the provisions of the new act requiring statements of coal mined.

As soon as it is settled that no appeal will be taken by the state, some companies will make an effort to return to the consumers the tax collected under the 1913 act, but if the state attempts to collect the tax under escheat proceedings no tax money will be returned at present.

Jersey Central Must Sell Lehigh & Wilkes-Barre

The United States District Court on Oct. 28 decreed that the ownership of the Lehigh & Wilkes-Barre Coal Co. by the Central R.R. of New Jersey is a combination in restraint of trade and that the Central company must dispose of its interest in that concern.

The decree filed by the court is on the decision of the court last June in the government's anti-trust suit against the Reading company, Jersey Central and others. The court at that time suggested that the Lehigh & Wilkes-Barre company be divorced from the Jersey Central.

As the subject of this separation was not argued when the case was heard, the court in its decision last June suggested it for consideration of counsel when the scope of the decree came to be determined. There was a difference of opinion as to in what form the decree should be and the court on the above date decided that the union of the Philadelphia & Reading Coal & Iron Co. and the Lehigh & Wilkes-Barre Coal Co. through the instrumentality of the Reading company is a combination in restraint of trade and violates the anti-trust act of 1890.

The Reading company, a holding corporation, owns all the stock of the coal and iron company and a majority of the stock of the Jersey Central, the last named in turn owning a majority of the stock of the Lehigh & Wilkes-Barre Coal Co.

The court decreed that after 90 days from date the defendants must submit a plan for the disposal by the Jersey Central of all the stock and other securities of the Lehigh & Wilkes-Barre Coal Co. now owned by it unless an appeal is taken to the United States Supreme Court. If the defendants fail to present a plan the court will take such further steps by receivership or otherwise as may then seem necessary.

Pending the disposal of the Lehigh & Wilkes-Barre Coal Co.'s stock, the Jersey Central, the Reading Co. and all other corporations controlling any stock are enjoined from voting it.

PENNSYLVANIA

Anthracite

Weatherly—The Lehigh Valley Coal Co. has commenced work on the construction on a drainage tunnel in an effort to clear its workings of water at Buck Mountain.

Williamstown—The forestry services of the Pennsylvania R.R., the Philadelphia & Reading Coal & Iron Co., the Lehigh Valley Coal Co. and the Susquehanna Coal Co. were represented at the meeting of the timber owners of Dauphin County on Oct. 26, and organization of the Susquehanna Forest Fire Protective Association was completed. The forestry protective department of the Pennsylvania R.R. includes about 10,000 acres of woodland; the Philadelphia & Reading Coal & Iron Co. preserves comprise about 15,000 acres and the Susquehanna Coal Co. timber holdings cover some 5,000 to 10,000 acres.

Tamaqua—After an idleness of 8 days the 600 employees of the Maryd Coal Co., at Maryd colliery near here have resumed work. The trouble originated over the handling of grievances by the mine committee of the mine workers. Three "locals" are formed by the men at this colliery and of this number the Maryd local claimed the larger percentage of employees and appointed the mine committee. This committee, it was claimed by the other two locals, would not handle their troubles, when asked again and again, and when the two locals composed of the other employees endeavored to have the committee replaced by one of their selection, they were met with a refusal by the company officials, who claimed that but one mine committee was all they were compelled to deal with. The company officials found that the dissenting locals had the majority of employees enrolled and they at once met the new committee. Upon the acceptance of the committee the men decided to return to work pending an adjustment of their trouble.

Shamokin—As the result of an explosion of a boiler, the fan and boilerhouse of the Susquehanna Coal Co., at Shamokin, was completely destroyed recently, causing a loss to the property amounting to $2,500. Charles Schlegle, a fireman in the employ of the company, was probably fatally injured.

Bituminous

Robertsdale—The Rockhill Iron & Coal Co. is installing a 500-kw. Kerr mixed pressure turbo-generator at the Woodvale plant, where a fireproof boiler- and power-house is under construction. Hoffman Bros. of Punxsutawney, have had two diamond drills at work on the company's property for almost two years and contract for two new slopes has recently been awarded to the S. J. Harry Co. of Connellsville. The East Broad Top R.R., over which this coal is shipped, is erecting a new transfer plant at Mt. Union equipped with conveyors, picking tables, etc., to handle an increased output.

Indiana—One of the worst car famines ever experienced by the coal operators of this part of the state has struck the Somerset and Indiana County coal fields, just at a time when the coal business was beginning to boom. It is stated by the operators dependent on the Baltimore & Ohio and Western Maryland railroads for shipping facilities from the Somerset County field that the car shortage last week amounted to about 30 per cent. In Indiana County it is stated that the shortage is leading to a curtailment of output, the mines working only part time, whereas they might be working full time on the orders now received. In Somerset County some of the coal is being stored in the hope that the car famine will soon be relieved.

Connellsville—The shipments of coke from the Connellsville region recently amounted to 437,000 tons per week while production only reached 428,000 tons. The region as a whole is operating at approximately 80 per cent. of its total oven capacity. The Connellsville coke operators are scouring the country for men to operate the idle ovens.

Work has been started in cleaning up the Gaylord mine of the Pittsburgh & Cleveland Coal Co.

Adamsburgh—The Edna No. 1 Mine of the Pittsburgh & Baltimore Coal Co. will shortly resume operations after an idleness of a year. It is reported that the company has several large orders booked which will mean steady employment for about 250 men.

VIRGINIA

Toms Creek—The Virginia Iron, Coal and Coke Co. has placed 550 ovens in blast at this place, and it is reported that others will be placed in operation at Inman and other localities in Wise County field. It is said that this activity is largely the result of preparations for blowing in the Max Meadows and other iron furnaces in southwest Virginia.

WEST VIRGINIA

Charleston—According to the statement of Earl A. Henry, chief of the Department of Mines, the operations of the United States Coal and Coke Co. in McDowell County have established a remarkable casualty record. It is believed that this is the best record ever made in West Virginia and it is said that it has never been equalled in the United States in the same character of mines. Employing 1,667 men, of whom 1,095 were foreigners, and producing approximately 1,618,490 tons of coal, only one man was lost through fatal accident in the fiscal year ending June 30. During the same period of time, 455 fatal accidents occurred in the entire state, the tonnage per fatality being 140,856 tons.

Huntington—All previous coal loading records on the Chesapeake & Ohio R.R. for a single day were recently surpassed when 2,875 cars were loaded with 145,300 tons. The nearest previous record was on Oct. 18, when 2,559 cars were loaded with 119,235 tons. It is expected that the loadings for October will exceed those for September which up to that time was the best month in the road's history.

Belington—The coal mines in Tygart Valley are showing great improvement. Plenty of work is in sight, and the miners who have been on the "watchful waiting" list are now selecting places. The Davis Colliery Co. has started to open the Junior mines which have been closed for some months. Preparations are under way at the Meriden mine for a large tonnage. Century, Lillian, Arden and Gage are working daily while Dartmoor and Weaver are working better than for many months. Other small mines are running to capacity and it is believed that by Dec. 1 all the mines and ovens in the territory will be in full operation.

KENTUCKY

Hartford—Neighbor Bros. have opened a 6-ft. vein of fine coal on the Taylor lands, near Beaver Dam, Ky., and are retailing lump and nut coal from the workings.

Bevier—The tipple at the mine of the Crescent Coal Co. was destroyed in a recent fire. Several weeks will be required in reconstructing this part of the plant.

Whitesburg—In order to fill the increased orders for coal from the fields around Fleming, McRoberts, Jenkins, Dunham and Haymond, several hundred men have been put to work in the mines during the past few days. It is said that the plant of the Elk Horn Mining Corporation of Fleming and Beaver Creek will about double its present output during the next three weeks, besides starting up the mines in Hemphill which have been standing idle for nearly 12 months. Practically the same conditions prevail in all the other fields of eastern Kentucky.

Haymond—In drilling for water near this town a rich flow of natural gas was discovered at a depth of a little less than 150 ft. It is generally believed that the Pottersfork section is rich in gas and will soon become a producing territory. It is said that a company will be immediately organized for the development of the property on a large scale. It is also believed that oil exists in this territory.

OHIO

Martin's Ferry—It is reported that all the idle mines in this section would, if operating, employ only about 2,000 men. This means that only the small mines are idle and that the coming of winter finds the men either employed at other mines or in other occupations. With two or three exceptions it is said that all the big mines in the entire field are working.

Bellaire—The Schick Coal Mine shut down recently by a strike has resumed work. The old check weighman complained of by the miners was put back to digging coal. The miners complained of the check weighman and elected a new one. When this man reported for work the company refused to recognize him and the miners struck. The strike was settled at a conference of the sub-district officials and mine owners.

Fairpoint—With approximately 100 miners employed the Fairpoint Coal Co. has resumed operation for the first time since the eastern Ohio coal strike was declared. It is said that conditions in the eastern Ohio coal field look much better than a month ago, and it is believed that a steady return to normal business will follow.

Athens—That officials of the Sunday Creek Co. believe there will be an adjustment of freight rates and the wage scale with the miners in the near future is indicated by the heavy expenditures made by the company. Tipples have been rebuilt at three mines already, and it is reported that new equipment for 10 of the 23 mines of the company in southeastern Ohio has been ordered.

Lathrop—Preparations are under way for the resumption of work at the mines of the Black Diamond Coal Co., at Lathrop, which have been closed since June 1. A force of men is engaged in cleaning up the mine, and 200 miners will be placed at work at once.

ILLINOIS

Belleville—R. W. Ropiequet, attorney of the St. Louis Coal Traffic Bureau, delivered an address recently to the Belleville Commercial Club on "The Railroad Situation and How It Affects Belleville." He spoke particularly about how Belleville's coal interests are affected by the railroad situation.

Hillsboro—State's Attorney Major has consented to drop the prosecutions begun recently against the pit committee of the local miners' union, charged with interfering with the employment of five miners who were members of the state militia. The state officials of the United Mine Workers of America have agreed to reinstate the militiamen, who had been suspended. They are to be permitted to remain in both the militia and the union and are to be compensated by the union for the time lost while they were under suspension.

COLORADO

Denver—The Bear River Coal Co., George N. Sparling, president, 732 Gas & Electric Building, Denver, who in July, 1914, filed on 160 acres of Government coal land in Routt County, Colo., and opened a mine at that time and has since been driving entries under the ruling that only development work could be done till the land was appraised and paid for, has succeeded in having this done and is now going ahead pushing the production of coal. The mine is located at Bear River. Shaker screens are being installed. The coal is 10 ft. thick.

WASHINGTON

Seattle—Suit to foreclose a mortgage of $250,000 on the properties of the Issaquah & Superior Coal Mining Co. has been started by a local bank which holds the mortgage. The bank bought the notes and mortgage last July at a sale held by the U. S. Marshal.

Auburn—It is reported that after several weeks of prospecting, J. G. Evans has found a rich bed of coal three miles northeast of Auburn. The coal bed is apparently 6 ft. or more in thickness and covers an unknown area. The coal is said to compare favorably with the best from the Black Diamond mines.

Chesaw—A bed of bituminous coal between 3 and 4 ft. thick has been encountered 7 mi. west of Molson by well drillers. The depth of the coal bed is approximately 90 ft.

FOREIGN NEWS

Copenhagen, Denmark—The Danish Government is taking steps to mine coal upon a commercial scale in Greenland. This is due to the fact that it is now difficult to buy English coal in Denmark, the coal famine being so serious that the government is planning to relieve the situation in part by cutting wood from the government forests. Coal has heretofore been mined in Greenland only in an experimental way, but the deposits in the opinion of experts are quite extensive. The heating quality of the fuel is, however, not regarded as equal to that of English coal.

PERSONALS

Van H. Manning will address a meeting at the Carnegie Institute of Technology at Pittsburgh, Penn., on Monday evening, Nov. 8.

F. W. Whiteside, of the Victor American Fuel Co. of Denver, Colo., has gone to California via New Mexico on a combination pleasure and business trip.

J. Ray Quinn for the past 6 years in the employ of the Central Fairmont Coal Co., recently resigned and accepted a position as manager of the Gano-Moore Coal Co., in Philadelphia, Penn.

F. J. Durdan, general sales agent of the B. S. Hamill Fuel Co., has severed that connection and will hereafter continue in the bituminous jobbing trade in Buffalo, N. Y., under his own name.

Hugh Gaffney, of Bridgeport, Ohio, formerly Deputy State Mine Inspector, has accepted a position as superintendent of Providence mine No. 1, of the Providence Coal Co., north of St. Clairsville.

F. L. Fenstemacher, assistant manager of sales for the Oliphant-Wasson Coal Co. will be in charge of a new office the company has opened in the Traction Terminal Building at Indianapolis, Ind.

D. A. Thomas, the Welsh coal operator, who is in America looking after ammunition shipments for the English government, has returned to New York from Canada. He is at the Plaza Hotel and expects to remain here for a few weeks.

D. D. Dodge, superintendent of the Carbon Coal and Coke Co., Cokedale, Colo., has gone to the coal fields of Pennsylvania to make an exhaustive study of the longwall conveyor in order to determine its adaptability to the Cokedale mines.

James R. Wooldridge, president of the Southern Appalachian Coal Operators' Association, has appointed a committee to look into the possibilities in the way of export business, seeking to land some of the large export orders for the mines of eastern Kentucky.

O. Tibbett, for many years superintendent of the Davis Coal and Coke Co., has tendered his resignation, and will retire from active mining operations. Mr. Tibbett takes this step on account of his advancing years, rendering the position which he has held for some time too arduous and exacting.

W. E. Hackett, of Spiro, Ark., recently resigned as mining engineer and assistant superintendent of the Bache-Denman coal properties, in Arkansas and Oklahoma, which are in the hands of a receiver and closed down, and is taking a trip through the Alabama, Tennessee and Kentucky coal fields.

J. M. Webb, in charge of first aid and rescue work instruction of the United States Bureau of Mines in Tennessee, southeastern Kentucky, and southwestern Virginia and West Virginia, with headquarters in Knoxville, Tenn., but who has for some time been residing at Birmingham, Ala., has moved his residence and family to 1907 Yale Ave., Knoxville. His office is at 232 Post Office Building.

Neil Robinson, of LaFollette, Tenn., receiver of the LaFollette Coal, Iron and Ry. Co. and the LaFollette Iron Co. returned recently from Boston, Mass., where he has been on business connected with these companies. The stock and bonds of these companies is held largely in Boston, and a movement is on foot by the Boston interests to reorganize these companies, together with the Co-operative Store Co., the commissary end of the LaFollette enterprises, into one company, with Mr. Robinson as president. It is expected that this deal will be consummated by the first of the year.

Edward J. Berwind, president of the Berwind-White Coal Mining Co., No. 1 Broadway, New York City, is one of the members of the newly formed Delectable Society of the Dotards of 1848, an even dozen of men born in 1848 who have achieved distinction either in commerce, finance or a profession. Each member holds an office in the organization. Mr. Berwind is described as follows in the roster of membership as it appears in the Dotards constitution: "Edward J. Berwind, official miner of the club; born June 17, 1848; president of the Berwind-White Coal Mining Co. and prominent in many large enterprises."

OBITUARY

Roswell G. Feltus, former general shipping agent, of the Philadelphia & Reading Coal and Iron Co., died suddenly in Philadelphia recently. Mr. Feltus was 75 years of age, was a veteran of the Civil War, in which he attained the rank of captain. He was also a member of many clubs and prominent in the affairs of the Episcopal Church.

Jacob P. Bauer, 69 years old, who was known to every river and coal man between Pittsburgh and New Orleans, died recently at his home, 3295 Montana Ave., Westwood, Ohio, after a short illness. He was for 40 years general manager of the W. H. Brown's Sons Coal Co., and after that concern was taken over by the Monongahela River Consolidated Coal and Coke Co. he was for 10 years local manager for that company. He retired about three years ago.

John J. Monaghan, 65 years old, a former district superintendent for the Philadelphia & Reading Coal and Iron Co., died on Oct. 24. He was born in England in 1850. At an early age he started to work in the mines and gradually rose from door boy to superintendent. He was retired about a year ago. He was a director of the First National Bank and president of the Shenandoah Building and Loan Association. A widow, four sons, all doctors of medicine and leading practitioners, and four daughters survive him.

RECENT COAL AND COKE PATENTS

Mining Machine. E. O'Toole. Gary, W. Va. 1,151,383 Aug. 24, 1915. Filed June 11, 1907. Serial No. 378,378.

Furnace. W. J. A. Muirhead, Seattle, Wash. 1,154,717 Sept. 28, 1915. Filed Oct. 22, 1914. Serial No. 867,981.

Coke Oven Door. E. C. Auld, Scottdale, Penn. 1,151,331 Aug. 24, 1915. Filed Apr. 3, 1914. Serial No. 829,323.

Mining Machine. B. Viviani, Monessen, Penn. 1,154,459 Sept. 21, 1915. Filed June 23, 1914. Serial No. 846,849.

Chimney Draft Device. E. Prat, Paris, France. 1,151,611 Aug. 31, 1915. Filed Aug. 29, 1913. Serial No. 787,315.

Mechanical Stoker. J. Van Vleck, New York, N. Y. 1,151,138 Aug. 24, 1915. Filed Feb. 20, 1915. Serial No. 9482.

Mine-Car Brake. C. E. Morgan, Holdenville, Okla. 1,154,041 Sept. 21, 1915. Filed June 24, 1915. Serial No. 36,097.

Rocking Grate Bar. C. R. Waid, Birmingham, Ala. 1,151,746 Aug. 31, 1915. Filed May 25, 1914. Serial No. 840,851.

Separation of Coal. F. W. C. Schniewind, Englewood, N. J. 1,152,442 Sept. 7, 1915. Filed Jan. 30, 1913. Serial No. 743,185.

Smoke-Consuming Furnace. C. H. Moore, Bellwood, Penn. 1,154,877 Sept. 28, 1915. Filed Feb. 26, 1915. Serial No. 10,706.

Brick Arch for Boiler Furnaces. C. F. Street, New York, N. Y. 1,153,648 Sept. 14, 1915. Filed May 22. 1915. Serial No. 29,873.

Purification of Coal. F. W. C. Schniewind, Englewood. N. J. 1,153,182 Sept. 7, 1915. Filed Dec. 19, 1912. Secial No. 737,689.

Fine Coal and Ore Separator. J. M. Draper, Manchester, England. 1,151,448 Aug. 24, 1915. Filed Apr. 4, 1914. Serial No. 829,581.

Miner's Safety Lamp. M. Albrecht, Frankfort-on-Main. Germany. 1,153,003 Sept. 7, 1915. Filed Nov. 24, 1913. Serial No. 802,819.

Downdraft Smoke-Consuming Boiler Furnace. C. H. Hook, Pittsburgh, Penn. 1,151,592 Aug. 31, 1915. Filed Feb. 3, 1915. Serial No. 5838.

Machine for Leveling Coal in Bee Hive Coke Ovens. J. H. Huhn, Fairmont, W. Va. 1,155,066 Sept. 28, 1915. Filed Mar. 5, 1910. Serial No. 547,441.

Apparatus for Electrically Igniting Miners' Safety Lamps. V. E. Joyce, London, Eng. 1,154,992 Sept. 28, 1915. Filed July 24, 1914. Serial No. 852,948.

Gas Producer. E. A. W. Jeffries, assignor to Morgan Construction Co., Worcester, Mass. 1,153,623 Sept. 14, 1915. Filed **Apr. 1,** 1909. Serial No. 487,355.

Coal-Mining Machine. C. C. Hansen, Assignor to Ingersoll-Rand Co., Jersey City, N. J. 1,154,922 Sept. 28, 1915. Filed Dec. 12, 1912. Serial No. 736,253.

Automatic Stoking Mechanism. D. T. Williams, assignor to Standard Stoker Co., Wilmington, Del. 1,152,682 Sept. 7, 1915. Filed Dec. 6, 1913. Serial No. 805,021.

Mechanism for Preparing Pulverulent Materials for Molding or Briquetting. E. B. A. Zwoyer and R. A. Zwoyer. 1,152,469 Sept. 7, 1915. Filed Oct. 26, 1908. Serial No. 459,577.

Mine-Car Wheel. W. D. Hockensmith, assignor to Hockensmith Wheel and Mine Car Co., Penn Station, Penn. 1,154,990 Sept. 28, 1915. Filed Mar. 6, 1915. Serial No. 12,562.

Machine for Making Briquettes. E. B. A. Zwoyer and R. A. Zwoyer, assignors to Zwoyer Fuel Co., a corporation of New Jersey. 1,152,468 Sept. 7, 1915. Filed Oct. 26, 1908. Serial No. 459,576.

PUBLICATIONS RECEIVED

State of Missouri, "28th Annual Report of the Bureau of Mines, Mining and Mine Inspections." Unillustrated, 159 pp. 6x9 in.

Department of the Interior, U. S. Geological Survey, Water Supply Paper 375 B. "Ground Water in Paradise Alley, Ariz." By O. E. Meinzer and A. J. Ellis. Illustrated 25 pp. 6x9 in.

Department of the Interior, U. S. Geological Survey, Bulletin 587. "Geology and Mineral Resources of Kenai Peninsula, Alaska," by G. C. Martin, B. L. Johnson and U. S. Grant. Illustrated, 243 pp. with insert, 6x9 in.

INDUSTRIAL NEWS

Alton, Ill.—E. H. Smiley has been appointed at Belleville, Ill., as receiver for the Joseph Taylor Coal Co., of Alton.

Penn Station, Penn.—The Hockensmith Wheel and Mine Car Co. is now operating an addition to its plant and doubling its shop capacity.

Altoona, Penn.—Shipments of coke over the Pennsylvania R.R. lines in September amounted to 1,152,668 tons. For nine months coke carryings have aggregated 8,378,576 tons, an increase of 816,718 tons or 10.8%.

Washington, D. C.—The State Department is asking American railroads to cut off supplies of fuel to the enemies of the de facto government in Mexico as a supplementary proceeding to the embargo on arms and ammunition.

Cincinnati, Ohio—The Roberts & Schaeffer Co., of Chicago, recently closed a contract with the Campbells Creek Coal Co. for a 200-ton per hour Marcus patent picking table screen equipment for immediate installation in Putney, W. Va.

Wheeling, W. Va.—A freight car shortage is menacing the mining industry in eastern Ohio. Because of their inability to secure sufficient freight cars to handle the output, many operators have been forced to lay off miners or to work their mines only part time.

Summerville, Penn.—The Pennsy Coal Co. recently awarded a contract to the Roberts & Schaeffer Co. for a three-track frame constructed Marcus patent coal tipple with mechanical equipment for installation at Summerville. The aggregate cost of this structure will be $19,500.

Philadelphia, Penn.—The Federal District Court recently decided that the ownership of the Lehigh & Wilkes-Barre Coal Co., by the Central R.R. Co. of New Jersey was a combination in restraint of trade, and that the railroad must dispose of its interest in the coal company.

Richmond, Va.—The Norfolk & Western Ry. has placed orders for steel for the construction of 1,000 all steel coal cars, which are to be of the latest gondola type now in use on the road. The capacity of the cars will be 100 tons each, and they will be of the double-truck, 12-wheel type.

Philadelphia, Penn.—The Philadelphia & Reading Ry. has just let a contract to the Palmer Shipyard Co., Noank, Conn., for the construction of a number of coal barges to be used in the extensive Philadelphia-New England tidewater coal trade, in which the company already has a large fleet.

Helena, Mont.—The Montana Railroad Commission has ordered a reduction in rates on slack coal from the Bear Creek fields to points on the Northern Pacific R.R. The reduction to stations under 75 mi. is 10c.; between 75 and 125 mi., 15c.; between 125 and 250 mi., 20c., and to all points in Montana over 250 mi., 25c.

Indianapolis, Ind.—The Oliphant-Wasson Coal Co., which has just recently completed the equipment of a large and complete mine, announces the opening of an office in the Traction Terminal Building, at this place. The company specializes on "Old Vincennes" coal which is mined at Bruceville in Knox County.

Charleston, W. Va.—Alleging that the company is unable to operate its mines at a profit and meet outstanding obligations, W. Bernard Duke recently filed a bill in equity in the Federal Court against the Davy-Pocahontas Coal Co. He asked that a receiver be appointed. This firm operates practically entirely in McDowell County, W. Va.

Buffalo, N. Y.—The rebuilding of the lake trestle of the Delaware, Lackawanna & Western Co., now in progress by government order, to facilitate widening the mouth of Buffalo River, will make it necessary to remove the trestle about the middle of November. A car dump will be put in to replace the trestle and probably a box-car unloader.

Whitesburg, Ky.—Many coke ovens have been fired within the past few days in Wise County, Va., immediately beyond the Kentucky line. Most of these have been idle for several years. As a result thousands of new men have been added to the working force. The ovens are divided among the plants at Stonega, Osaka, Roda, Blackwood, Dorchester and Glamorgan.

St. Louis, Mo.—The Sullivan Machinery Co., of Chicago, announces the removal of its St. Louis branch sales office from 705 Olive St. to Suite 2006, Railway Exchange Bldg., where larger and more desirable quarters have been secured. This change will enable the company to give better attention to the requirements of its customers in the territory served by the St. Louis office.

Fairmont, W. Va.—The Baltimore & Ohio R.R. is preparing to place an order for 1,000 additional coal hoppers. The Western Maryland R.R. recently placed an order for 2,000 coal cars, while the Baltimore & Ohio a short time ago placed an order for 2,000 coal cars. This makes the total number of cars purchased by the two roads 5,000. Most of these cars will be used in the upper Monongahela Valley.

Fairmont, W. Va.—One of the largest industrial deals which has taken place here in many years was recently consummated when the Monongahela Valley Traction Co. took over the holdings of the Fairmont Gas Co. The capitalization of the traction company is to be increased from $7,500,000 to $12,500,000, with an authorized preferred capital stock of $3,000,000, while common stock will amount to $9,500,000.

Bristol, Tenn.—Following the general revival of the steel, iron and kindred industries, practically all of the coke ovens in southwest Virginia, many of which have been idle, have resumed operation, or will resume operation shortly. Active preparations are being made to put several furnaces and steel mills into operation, and it is expected that within the next 30 days industries in this section will be more active than at any time since 1907.

Bloomsburg, Penn.—The Supreme Court having ruled Keran Donahue off the ticket as a candidate for mine inspector because this office cannot be voted for in an odd numbered year, his attorney has now taken the position that James O'Donnell, present holder of the office, was illegally elected in 1911. The attorney has filed a petition with the court asking that the office be declared vacant, and that Mr. Donahue, who defeated Mr. O'Donnell for the nomination at the recent primary, be appointed to the office.

Jenkins, Ky.—A total of 300,000 acres of timber land in eastern Kentucky and 100,000 acres of which is the property of the Consolidation Coal Co., has been pledged to the Eastern Kentucky Forest Protective Association. This timber is in the Elkhorn and Boone's Fork sections and the first lookout station has been established in the heart of the Cumberland Mountains contiguous to the Virginia border line. It is connected by telephone with the local exchange. Other stations are projected. Twelve counties in eastern Kentucky have organized for fire protection.

Columbus, Ohio—The New Pittsburgh Coal Co., the only Hocking Valley operator that has shipped Lake coal this season to its docks, is finding the last stage of the navigation period a very lively one. Its mines are all running full time, and it has more orders from the Northwest than it will be able to take care of before boats go out of commission. Sales Manager Rundio is of the opinion that, weather permitting, the season will be greatly extended this year, because of the strong demand that has set in from the upper docks.

Coal Trade Reviews

General Review

Anthracite buying slowed up by mild weather but market has not lost ground. Heavy movement on bituminous contracts. Scarcity of vessels causes accumulations at Tidewater. Lake movement increasing. Middle Western mines on heavy working schedules.

Anthracite—The volume of coal moving has greatly increased and definite steps have been taken toward advancing quotations. The slowing up in orders occasioned by temporary mild weather have been offset by increased stocking operations among dealers who are becoming anxious over the outlook. An unusual succession of holidays in the mining regions has interfered with operations at a rather critical time. Poor car supply and slow movement on the roads continues to be the source of much anxiety. Demand at the more remote points, where shipments are difficult to obtain, is particularly strong. Full circular prices rule.

Bituminous—There is active canvassing for contracts and concessions are still obtainable for delivery before Jan. 1, but the circular is firm on business to Apr. 1. Shippers are backward about admitting any particularly heavy business, though it is obvious that most of them have more orders on hand than can be filled, while the railroads uniformly report an exceptionally heavy movement. Manufacturing interests, with storage facilities, are accumulating surpluses against possible difficulties later. Some of the better grade coals have been withdrawn from the market. The increased movement is confined largely to requisitions on contracts, and there is considerable coal arriving at the distributing centers. Restricted car supply is still interfering with mining operations.

Exports—A considerable volume of coal is accumulating at tidewater points because of the slow movement of vessels. Bunker demand continues strong and is the only active department of the off-shore business. Very few steamers are available for export trade, and these are difficult to obtain even at the unprecedented freights offered. However, foreign inquiries continue numerous, and this in spite of the fact that it is gradually developing that the British embargo against export shipments declared some months ago has been practically abandoned.

Lake Markets—While fundamental conditions are growing steadily better, iron and steel mills pushing for maximum tonnage, and cold weather now at hand, the trade is on the other hand, facing the release of the heavy production now going into the Lake markets. As a rule, the entire output is going into immediate consumption with the possible exception of some stocking on the part of the railroads, and other consumers will have to take this up shortly in order to provide against possible contingencies next April. It is becoming more obvious all the time that the transportation companies are not prepared for the heavy increased traffic and car supply continues a constant menace to the trade. Considerable negotiations are noted on contracts expiring between now and the first of the year. A large number of cars sent into the Northwest with coal earlier in the season have not been returned, which is accentuating the difficulty in this respect.

Middle Western—There is considerable pressure for coal on contracts although the mild weather has resulted in the trade being rather inactive at the moment. However, the lull in orders has given some of the agencies a welcome opportunity to catch up on their business, and there is a well-defined tendency among manufacturers to accumulate stocks of steam coal, while prices on all grades are holding steady all along the line. Mines are working on the highest operating schedules for a long time. The railroads have not fallen seriously behind on the movement so far, but it has been such a distinct effort to keep up that there is general anxiety concerning this phase of the question. Northwestern railroads are buying heavier and there is considerable coal moving to their storage plants from the upper Lake docks. Lake shipments are showing a steady increase with the approaching close of navigation.

A Year Ago—Anthracite production heavy last month but market is still dragging. Spot demand for bituminous has entirely disappeared and heavy concessions are the rule. Lake trade still further curtailed but Middle Western situation improves.

BUSINESS OPINIONS

Iron Age—Never has the steel trade seen demand so overwhelming as at present, and, at the same time, output expanding on such a scale, under steadily advancing prices. The tide has risen rapidly this week with increasing signs of excitement. In pig-iron history October goes down as the month in which the country's yield first reached 3,000,000 tons, and the daily output crossed the 100,000-ton mark. When war order tonnages of six figures are bandied about so commonly it is hard to believe that the year opened with a daily pig-iron production of only 51,000 tons, or half what it is now.

American Wool and Cotton Reporter—With sales of 10,750,000 bales of wool during the week under review the wool market has been considerably more active. It is said that a more general business for all kinds of wool has never been seen before. The market has been particularly active in territories, Capes, and Australians. Large trades are pending. Besides the business of the big mills about every little woolen mill in the country is running full time. It is predicted that even after the war ceases there will be nothing to warrant a decrease in values or business for some time to come. Some mills, which have been relying upon foreign business in order to keep in operation, are now running on domestic orders.

Boston News Bureau—General trade is increasing in volume and commercial interests are busy and confident. The election is bound to have a stimulating effect in financial circles. There is no doubt but that the renewed vitality of the Republican party is a favorable feature, because it indicates a coming return of the party to power which means a change in tariff by the time the European war comes to an end. A favorable factor is that railroad earnings are beginning to show substantial gains. Crops are not only moving but we are commencing to feel the benefits from the transportation of war materials.

Bradstreet—The trade and industrial stream is running fuller and in some cases is out of its banks. Warm weather is a drawback temporarily to retail trade the country over, but helps the drying of corn and the threshing of wheat, now much delayed. Jobbing trade is more active, and industry shows a still speedier pace, with some hitherto lagging lines, such as lumber, especially at the south, naval stores, coal, jewelry and shoe manufacturing, making better progress.

The Southern Lumberman—Optimism still reigns supreme in the yellow pine market. Price advances which have been repeatedly made during the past month and which have ranged in the aggregate from $1 to $2.50 on practically all items during that time are not only being maintained, but are expected to reach still greater heights in the immediate future. The hardwood market is maintaining its steady progress, and reports indicate that buying is decidedly more active, and that the sources of demand are more diversified.

Marshall Field & Co.—Current wholesale distribution of dry goods shows a healthy increase over the corresponding period of a year ago in spite of the warm weather which has tended to restrict demands upon the retailer. Road sales for both immediate and spring delivery are running ahead of the past two years, and merchants continue to come into market in much larger numbers. Collections are well ahead of a year ago.

Dun—Not only is there no step backward in general business, but each week the pendulum of progress swings over a wider area and confidence is further strengthened. Recent vagaries of the weather have not been conducive to the best results in retail distribution, yet substantial gains are nevertheless apparent in this direction. The forward movement gathers momentum in spite of various opposing influences, such as the unstability of foreign exchange, the congestion of freight at terminal points and continued dissension in the ranks of labor, and, while expansion is still most pronounced in war order lines, on the whole, conditions and prospects are much less checkered and irregular than formerly.

ATLANTIC SEABOARD

BOSTON

Pocahontas and New River fairly steady, with no price developments. Georges Creek easy, but inquiry continues active for the Pennsylvania grades. Water freights firm. Anthracite trade active.

Bituminous—There is no material change in the situation of Pocahontas and New River. While there is a large volume of coal standing at the Hampton Roads piers, it is attributed more to the slow movement of vessels the past fortnight than to dullness of trade. It is on contracts, however, that by far the largest tonnage of these coals is moving, both spot and export inquiry being very light. Concessions are still being made on small tonnages for delivery before Jan. 1, but most of the agencies are adhering closely to the $2.85 basis for deliveries through to Apr. 1. The fact that the Pennsylvania grades are on the upward trend is bound to be reflected in the Hampton Roads situation sooner or later.

The various distributors inland from Boston, Portsmouth, etc., continue their active canvassing for contracts the next coal year. Prices on cars Mystic Wharf, Boston, are still freely quoted at $3.50 for such contracts, but the response from buyers so far has not been especially encouraging.

Georges Creek tonnage is being affected somewhat by the slack demand for export. Shipments to New England are coming forward regularly, although it is expected that car supply will begin to curtail the volume of this grade available for Tidewater.

The market on the choicer grades from Pennsylvania continues fairly active. No advance can be reported over quotations of a week ago, but on the part of shippers there is the same indisposition to quote for extended delivery.

All-rail trade is in good shape, a favorable movement on contract being especially noticeable. It becomes increasingly evident that plants with ample storage are accumulating coal in anticipation of difficulties later on.

Water freights are steady at 80@85c., Hampton Roads to Boston, on boats of 2,500 tons upward. Rates from New York to Providence are a trifle easier, 50c. rather than 55c. being the current quotation, the mild weather being a factor.

Anthracite—The demand is seasonable in all directions. What the weather lacks is more than made up by the desire of most dealers to keep on hand as large stocks as possible. The shippers are still able to fill orders without much delay. The recent ruling by the Pennsylvania Supreme Court unfavorable to the Pennsylvania state tax is a subject of great interest in this market.

Bituminous quotations, f.o.b. loading ports at points designated, are about as follows, per gross ton:

	Philadelphia	New York	Baltimore	F.o.b. Mine
Clearfields..............	$2.25@2.75	$2.55@3.00	....	$0.95@1.50
Cambrias and Somersets.	2.45@2.95	2.70@3.20	....	1.20@1.65
Georges Creek..........	2.92@3.02	3.22@3.32	$2.85@2.95	1.67@1.77

Pocahontas and New River prices, on cars Boston, are $3.50@3.73; Providence, $3.50@3.68; and f.o.b. loading port at Hampton Roads, $2.80@2.85.

NEW YORK

Anthracite demand heavy, but car supply short. Independents getting full company circular. Holidays interfere with mining. Demand for bituminous coal active and contract prices advanced. Lack of vessels interrupts export business.

Anthracite—The hard-coal market continues its activity, notwithstanding some mild weather. Buyers seldom have an opportunity of picking up a cargo of prepared coals at less than the full company circular and then only when the shipper happens to be long on that particular size. Mine operations have been interfered with by three holidays. On other days the mines worked full time unless prevented by the lack of cars. Transportation troubles curtail shipments and they promise to become greater. Already some shippers are becoming anxious and are advising their customers to take advantage of the present situation and stock up. Early this week shortages of egg, stove and chestnut were heard of.

Tidewater demand is no heavier than a week ago, but from New England points the call is heavier and prices stronger than in the Metropolitan district. Heavy demand also comes from the provinces, where the dealers are stocking up to guard against storms and transportation tie-ups. Shipments to Lake points are large and the line trade is taking its full quota.

Of the prepared coals stove is the shortest. Egg and chestnut are easier. Steam sizes are tightening and there is no accumulation. No. 1 Buckwheat is scarce and commanding the full circular. The better grades of Nos. 2 and 3 are out of the market.

Quotations, f.o.b. New York tidewater gross tons are as follows:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken................	$5.05		$5.10	
Egg....................	5.30	$5.20@5.30	5.35	$5.25@5.35
Stove..................	5.30	5.20@5.30	5.35	5.25@5.35
Chestnut	5.55	5.50@5.55	5.60	5.55@5.60
Pea....................	3.50	3.25@3.50	3.55	3.50@3.55
Buckwheat............	2.75	2.25@2.75	2.80	2.25@2.80
Rice...................	2.25	1.85@2.25	2.30	2.00@2.30
Barley.................	1.75	1.50@1.75	1.80	1.75@1.80

Bituminous—Demand for soft coal continues strong. While there is more coal at Tidewater than a week ago, prices remain firm and there has been no letting up. Owing to the activity in the local market some operators are sending all surplus coals eastward which may result in the overstocking of the local docks unless colder weather sets in or buyers stock up. Cars continue scarce and no improvement is in sight. In the majority of districts operations are curtailed. No operator seems to be getting his full quota of cars.

Contract movement remains active, while there is little of the better grades in the spot market. Efforts of large consumers to renew expiring contracts at old prices have met with failure, the agencies holding at close to existing market figures. In most instances the advanced prices were accepted.

Demand from the New England states is heavy and there is considerable coal being sent there at higher than Tidewater prices. Slack advanced another five cents during the week, making the mine price at from 95c. to $1. Lack of vessels continue to hamper the export trade, but the call remains active. Bunker demand is strong.

Current quotations, gross tons, f.o.b. New York harbor, are about as follows:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein.	$3.20@3.30	$3.20@3.30	$3.20@3.30	$1.75@1.85
Georges Creek Tyson....	2.95@3.00	2.95@3.00	2.95@3.00	1.40@1.45
Clearfield:				
Medium.............	2.80@2.85	2.80@2.85	....	1.25@1.35
Ordinary............	2.75@2.80	2.75@2.80	....	1.20@1.25
Broad Top Mountain..........				1.25@1.45
Cambria County:				
South Forks.........	3.05@3.10	....	....	1.50@1.60
Nanty Glo...........	2.90@3.00	....	....	1.35@1.45
Barnesboro..........	2.85@2.90	....	....	1.30@1.35
Somerset County:				
Quemahoning........	....	2.90@3.00	2.90@3.00	1.35@1.40
Medium.............	2.80@2.90	2.80@2.90	2.80@2.90	1.25@1.35
Latrobe..............	2.70@2.75	....	....	1.15@1.20
Greensburg..........	2.90@3.00	....	....	1.25@1.35
Westmoreland........	3.20@3.30	....	....	1.45@1.55
West Virginia Fairmont ¾		2.70@2.80	2.70@2.80	.90@1.10
Fairmont mine-run..............		2.70@2.75	2.70@2.75	.95@1.00
Steam..........................		2.70@2.80	2.70@2.80	1.15@1.25
Western Maryland..............		2.70@2.80	2.70@2.80	1.15@1.25

PHILADELPHIA

Anthracite now going strong, with big October tonnage. Pea advanced 25c. Stove strong and chestnut improving. Egg still slow, with pea heavily sold. Buckwheat active, but rice dull. Collections in good shape. Healthful tone to bituminous, with general price increases.

Anthracite.—The trade is now in its stride, with good business reported from all quarters. The advance by the big companies of 25c. per ton on pea coal, bringing the selling price up to $2.25 per gross ton, was one of the leading developments of the week. The action came as a surprise and though apparently an important step, it is really only a move to make it possible to get the advanced price by the first of the year. It is certain that very little coal will be sold at the new price before that time, as buyers are generally protected on the $2 price until Jan. 1. However, it is sure to stimulate buying, as there is no doubt that the new price will eventually be effective. The individuals now expect to have an opportunity to recoup for the sacrifices they made on this size in the spring and summer; they will get practically all of the business of the small dealers, who only buy as they actually need supplies.

The tonnage of the other sizes has increased greatly. Broken is easy; since the price of coke has gone up a number of companies report inquiries for this size from gas companies. With all collieries working to the full production, egg continues difficult to move and sales were made at $3.50 at the mines, without the tax. Stove seems well able to hold its own, and chestnut has improved to such an extent that the better grades have very little difficulty in getting full circular.

Buckwheat remains in constant demand and there are only a few of the harder grades in this size that show any tendency to drag. Considerable of this grade is going into private storage, as is also rice.

An effort was made by the Philadelphia Coal Exchange this week to bring an end to the retail price war, but at a "good fellowship" meeting engineered by the organization the price cutters refused to get together and some of the leaders even declared in strong language they were watching their competitors' every move with the express intention of not allowing themselves to be undersold and if necessary would go even lower. At this time they are taking extremely small profits on their best seller, pea coal, by delivering it at $4.50 where it is costing them $3.45 plus their expensive advertising. As to the larger sizes, they are receiving 50c. per ton less than they did this time last year.

The circular prices per gross ton at the mines and for tide shipments f.o.b. Port Richmond are as follows:

	Line	Tide		Line	Tide
Broken............	$3.50	$4.75	Pea...............	$2.50	$3.25
Egg...............	3.75	5.00	Buckwheat.........	1.25	2.25
Stove.............	4.00	5.00	Rice..............	.85	1.75
Chestnut..........	4.15	5.25	Barley............	.50	1.50

Bituminous.—Shippers are slow to admit that there is a particularly heavy trade, yet the fact remains that everyone has more orders than can be filled and the railroads report an exceptionally large tonnage moving. Of course the unfilled orders are due to the short car supply.

The export trade continues quiet and it is gradually developing that the embargo of the British Government against the export of native coal some months ago did not remain in effect more than a month. Although no public notice has been made of its removal, it is known for a fact that large shipments of coal are being made from the British Isles not only to the allied nations, but to neutral countries, particularly those of South America. Inasmuch as there is an extraordinary demand for vessels to carry the exceptional general tonnage offering, rates for coal remain very high.

The price per gross ton at the mines on the various grades of coal during the past week averaged about as follows:

Georges Creek Big Vein..	$1.70@1.80	Fairmont gas, ¾.........	$1.35@1.45
South Fork Miller Vein..	1.55@1.65	Fairmont gas, mine-run..	1.20@1.25
Clearfield (ordinary).....	1.20@1.30	Fairmont gas, slack......	.90@1.00
Somerset (ordinary).....	1.20@1.25	Fairmont lump, ordinary.	1.15@1.20
West Va. Freeport.......	1.05@1.15	Fairmont mine-run......	1.00@1.10
		Fairmont slack..........	.90@1.00

BALTIMORE

Car supply remains the dominating feature of the market. Demand growing stronger and the price list for' all available coal is tightening. Exports restricted.

The dominant feature of the coal trade situation is the car supply. Orders are fairly plentiful but producers and shippers are pulling out of the open market. Certain coals, for the most part of the better grade, are entirely out now.

The price list is naturally tightening under such conditions. If there were more coal on the market to offer it would probably go up faster as it is the best grades that have been withdrawn that are so urgently needed now. Slack went up with a bound the past week, advancing from 15 to 20c. and the market being restricted and strong at $1 in most cases.

Prices to the trade may be quoted about as follows where there is any free coal to offer:

	Mines	Balt.*	Fairmont	Mines	Balt.*
Geo. Crk. Big Vein	$1.80	$2.98	Ordinary mine run	$0.95	$2.33
Geo. Crk. Tyson...	1.50	2.68	Ordinary ¾.	1.00@1.10	2.43@2.53
Clearfield.... . .	1.30	2.48	Ordinary slack....	1.00	2.43
South Fork........	1.50	2.68	Low sulphur mine-run............	1.20	2.63
Latrobe....	1.10	2.18	Low sulphur ¾....	1.30	2 73
Somerset (best) ..	1.45	2.63	Low sulphur slack.	1.00	2 43
Somerset (good)...	1.25	2.43			
Quemahoning.... .	1.35	2.53			
Freeport..........	1.10	2.18			
Miller Vein.......	1.30	2.38			

* F. o. b., outside Capes.

HAMPTON ROADS

Movement both coastwise and foreign somewhat slow. Excess accumulations. Concessions made on the circular.

The movement of coal from Virginia tidewater for both foreign and coastwise consumption has been somewhat slow during the week. The demand for spot and contract business has been light and the indications are that the coming week will see little if any improvement. Coastwise shipments have practically all gone to New England with the exception of some small cargoes to one or two of the near ports South. Three cargoes for Gibraltar for orders are intended for one or more of the Italian ports, final destination being given at Gibraltar.

The accumulation of coal at the various piers is still in excess of normal. Circular prices are being quoted but indications are that these would be shaded somewhat for prompt movement. As has been the case for some time buyers from both European and South American ports are asking for c.i.f. prices which is difficult for shippers here to quote. The tonnage of bunker coal is still somewhat small as compared to normal conditions.

Ocean Charters, Clearances and Freights

VESSEL CLEARANCES

The following steamers have cleared from various ports, during the week ended Oct. 30:

NORFOLK

Vessel	Destination	Tons
Narvik[1]	Stockholm	6,370
Chiswick[2]	St. Lucia	4,636
Costante[3]	Civita Vecchia	5,050
Burstad[1]	Kingston	3,000
Eliopoli[3]	Genoa	5,433
Corcovada[2]	Rio de Janeiro	3,625
Ancon[4]	Canal Zone	9,266
Liguria[3]	Porto Ferrajo	4,536
M. Critchett[1]	Puerto Plata	805
Nereus[5]	Gib for Orders	5,450
Skogstad[6]	Spain	4,500
Wellington[6]	Gib. for Orders	8,320
E. W. Murdock	Santa Cruz	2,101
Carmen[5]	Gib. for Orders	7,150
Balgray[3]	Dakar	5,850
Bennestvet[1]	Pernambuco	2,703
Allaguash[2]	Rio de Janeiro	5,093

NEWPORT NEWS

Vessel	Destination	Tons
Theresa[1]	Havana	2,942
Vauxhall[7]	Naples	5,386
J. Serra[7]		3,034

BALTIMORE

Vessel	Destination	Tons
Lesa Maersk	Sweden	1,900
New Sweden	Sweden	7,003
A. B. Phillips	Martinique	826
Andrea Costa	Italy	4,737
Arnola Maersk	Sweden	2,862
Ruth B. Cobb	Martinique	893
D. Palmer	Italy	4,017
St. Theodore	Italy	7,304

PHILADELPHIA

Vessel	Destination	Tons
Pen. Sisters	Paramaribo	1,250
Bear Ridge[8]	Cambridge	
Temple[8]	E. Boston	
Enterprise[8]	Boston	
Draper[8]	S. Boston	
Logan[8]	Boston	
Wiconisco[8]	Portland	
Reading	Boston	
F. W. Munn	Portsmouth	
Gov. Robie	Portsmouth	
A. Wall	Casilda	1,000
M. Willey	Mayport	1,000
Leesport[8]	Portsmouth	
Kohinoor[8]	Brookline	
Maple Hill[8]	Boston	
Phoenix[8]	Bangor	
Pennypack[8]	Biddeford	
Tulpehocken	Saco	
Richardson[8]	Rockport	
Ontelaunee[8]	Brookline	
Rutherford[8]	Dorchester	
Robesonia[8]	Providence	
Brookside[8]	Brookline	
Skippack[8]	Brookline	
Dorothy[9]	Charleston	
R. McNalley[9]	Charleston	
Ashland[8]	Portland	
Mahanoy[8]	Boston	
Oak Hill[8]	Boston	
Cumru[8]	Portland	
Suffolk[8]	E. Cambridge	
Lincoln[8]	Com. Point	
J. M. Haynes	C. Francais	1,102
Poviga	Italy	2,057
E. W. Hinkley	Guayanilla	1,200
W. E. Downes	F. de France	639
Merriam[8]	Salem	
Oley[8]	Portsmouth	
Molino[8]	Portsmouth	
Tamanend[8]	Lanesville	
Barry[8]	Bangor	
Paxinos[8]	Portland	

NEW YORK

Benezuela	6
San. Domingo	653
Labrador	783
Cuba	535
San. Domingo	196
Yarmouth	400
Yarmouth	145
Windsor	10
West Indies	143

[1] Smokeless Fuel Co. [2] C. C. & B [3] Pocahontas Fuel Co. [4] Crozer-Pocahontas. [5] Flat Top Fuel Co. [6] Baker Whiteley. [7] Berwind White. [8] Phila. & Reading C. & I. Co. [9] Stonega C. & C. Co.

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	To	Tons	Rate
Washington	Mediterranean	3,231	
A. & M. Carlisle	Nassau	302	$3.50
Harflete	Italy		
Tenbergen	Havana	2,456	
Novo	Buenos Aires	2,200	8.50
E. Cassel	Sweden		

BALTIMORE

Vessel	To	Tons	Rate
St. Theodore	Genoa	3,176	
R. E. Merrill	Boston[1]	2,309	
A. Maersk	Denmark	1,209	
L. Maersk	Denmark	950	
A. Costa	Leghorn	2,418	
Atland	Sweden	2,744	

[1] Or Portland

VIRGINIA

Vessel	To	Tons	Rate
E. J. Lawrence	Barcelona	2,483	$10 00
H. Palmer	Lisbon	2,400	
D. Palfer	Italy	2,315	
A. Noble	Montevideo	2,616	

ATLANTIC RANGE

Vessel	To	Tons	Rate
Achlibster	Italy	2,820	15 60

OCEAN FREIGHTS

The steamer "Achlibster," about 7,000 tons coal capacity, is reported as having been chartered to load coals for the West Coast of Italy at or about $15.60, November loading, and three large sailing vessels have been chartered, one for West Coast of Italy, one for Barcelona, and the other for Lisbon, at or about $10 per ton, these freights paid in advance without discount, and charters paying foreign port charges and stevedore bills. $16.80 per ton has been paid on grain for the West Coast of Italy. Notwithstanding the high rates current on grain from the Plate outward coal freights to the Plate continue to advance.

The freight market is quotable about as follows:

To	Rate	To	Rate
Havana................	**$2.75**	Bermuda...............	$3 00@ **3.25**
Cardenas or Sagua......	3.00@**3.25**	Vera Cruz.............	4 75@ **5.00**
Cienfuegos............	3.00@3 50	Tampico...............	4.75@ **5.00**
Port au Spain, Trinidad.	3.75@4.00	Rio..................	9.60@10.32
St. Lucia.............	3.75@4.00	Santos*	9.84@10.56
St. Thomas............	3 25@3.50	Montevideo............	9.60@10.80
Barbados..............	3.75@4.00	Buenos Aires or La Plata	†9.60@10.80
Kingston..............	3 00@3.25	Rosario...............	10.80@12.00
Curacao...............	**3.50**	**West Coast of Italy....**	**15.60**
Santiago..............	3 25@3.50	Barcelona**...........	13.20@**15.60**
Guantanamo............	3 25@3 50	Valparaiso or Callao....	7.50
Demerara..............	5.50@6.00	Marseilles............	14.40@15.60

* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British steamers; neutral steamers are more difficult to obtain and the rates are always higher.

W. W. Battie & Co.'s Coal Trade Freight Report.

LAKE MARKETS

PITTSBURGH

Favorable and unfavorable influences balance. Operations at 70 to 75% of capacity, with many car shortages. Domestic demand light for the season of year.

The coal market is holding its own comfortably. Fundamental conditions as to consumption have been growing better, with cold weather approaching, iron and steel mills pushing for maximum tonnage outputs and railroads consuming more coal as well as stocking some, but there hangs over the situation the fact that Lake shipments will soon be over, releasing much mining capacity as well as furnishing more cars, and this just about balances the favorable influences.

Cars having been growing scarcer week by week and on many divisions shortages are now the rule, many mines operating fewer days than they would like. Here and there labor is less plentiful than would be desired, but there is no important shortage, at least thus far. Mine operations average 70 to 75% in the Pittsburgh district.

Domestic coal movement is very slow, the weather up to date having been unseasonably warm.

Prices have advanced slightly, the prompt market being quotable as follows: Slack, 70@75c.; nut and slack,, 90c.@$1; nut, $1@1.10; mine-run, $1.15@1.25; ¾-in., $1.25@1.35; 1¼-in., $1.35@1.45. Contract to Apr. 1: Slack, 85@95c.; mine-run, $1.15; ¾-in., $1.25; 1¼-in., $1.35, per net ton at mine, Pittsburgh district.

BUFFALO

Bituminous doing well with slack higher. All reports from the Pittsburgh district are bullish but the situation is not so strong here. Anthracite suffers from the mild weather. Orders canceled.

Bituminous—The movement is good and is increasing all the time. Practically all of the coal moving is going into immediate consumption. The railroads are stocking some, but the private consumer has only ordinary supplies on hand. It is the general belief that business in other lines besides iron and steel will be strong for the winter at least. If that is true the bituminous consumer must have a good surplus sometime during the winter and he may find it a problem to get it unless he begins to stock up soon. In fact it is probable that he has waited too long already as there are by no means cars enough to meet the demand as it is. Yet private consumers have been able to get all the coal they want at bottom prices.

The price of slack has advanced since last week, but sizes remain the same, with three-quarter not so strong as the average. Quotations are:

	Pittsburgh	Allegheny Valley	Penn Smokeless
Lump	$2.80	$2.65	$2.55
Three-quarter	2.65	2.55	.....
Mine run	2.55	2.35	2.30
Slack	2.25	2.20	2.30

These quotations are for Buffalo and eastward to Rochester on a short-ton basis. East of Rochester all bituminous is sold on a long-ton basis.

Anthracite — The trade is still suffering from the mild weather. There are some reports of orders being canceled on account of this, which is an unusual condition for this time of the year. It is likely that the consumption for the year is not going to be up to the average. The westward rail movement is not as heavy as it should be now though there is considerable moving by Lake. This is done to avoid stocking at this end. While Lake shipments are good, there is a scarcity of tonnage and vessels are often taken that are too small to handle easily at certain docks. Lake shipments for the week were heavy, amounting to 143,000 tons.

The wholesale prices of anthracite per long ton are: $5.60 for grate, $5.85 for egg and stove, $6.10 for chestnut, $4.30 for pea, $3.25 for buckwheat, $2.75 for rice, $2.50 for barley and $2.25 (not circularized) for screenings, f.o.b., with 25c. additional for delivering on board vessel.

COLUMBUS

Steam market very strong. Domestic demand slows up. Lake trade increasing with approaching close of navigation.

Business in steam coal is the best in a year and a half and prospects for the future are bright. In fact manufacturing is expanding so rapidly that some producers and shippers have difficulty in keeping up with orders. The tone of the trade is satisfactory in every way and many coal men are predicting a runaway market about the holidays.

In iron and steel circles the demand for tonnage is growing every day. But the demand is not confined to that line by any means and other lines of manufacturing are also prospering. Contracting is more active as quite a few expire from this time until the first of the year. In domestic lines there is a slight lull, due to the continued warm weather, Retailers are holding up shipments that were ordered some time ago but comparatively few cancellations have been reported. Retail prices are firm all along the line.

The Lake trade is rushing as the season draws to a close. Reports from the Northwest show that the congestion on the docks is passing away and there will be a rush from now until the closing of navigation. Chartering of boats is difficult. The Hocking Valley docks at Toledo handled more than 65,000 tons during the week ending Oct. 29 and the total tonnage handled by the docks since the opening of navigation is 2,251,000.

There is an increasing demand for anthracite in central Ohio territory and prices are ruling firm. Coke is also in good demand and many predict a scarcity within a very short time.

Prices in Ohio fields are as follows per short tons, f.o.b. mines:

	Hocking	Pomeroy	Eastern Ohio	Kanawha
Re-screened lump	$1.60	$1.65	.....	.....
Inch and a quarter	1.50	1.50	$1.35	$1.50
Three-quarter-inch	1.35	1.40	.....	1.35
Nut	1.25	1.30	.....	1.25
Mine-run	1.15	1.20	1.05	1.10
Nut, pea and slack	.70	.75	.65	.60
Coarse slack	.60	.65	.55	.50

Mines have been working at about the following percentages of full capacity:

District	Week Ended Oct. 9	Oct. 16	Oct. 23	Oct. 30
Hocking	50	55	60	65
Jackson	30	40	60	50
Pomeroy	65	85	65	90
Crooksville	45	50	85	65

District	Week Ended Oct. 9	Oct. 16	Oct. 23	Oct. 30
Cambridge	50	60	60	65
Massillon	55	60	45	70
Eastern O.	80	85	85	80
Average	55	62	65	69

TOLEDO

Domestic quiet due to mild weather. Steam grades active. Car supply short.

The domestic trade is quiet owing to the mild weather but there is an excellent tone to the market. A decided shortage of cars is reported. Mines on the C. & O. are not averaging over three days a week; the L. & N. is easier than most of the roads but the supply is tightening on this line also. The Pennsylvania is having difficulty in securing sufficient gondola cars due largely to the great activity in the steel industry.

Steam coal is in good demand and Pocahontas mine-run is steady at $1.40. Some of the larger companies claim to be entirely sold up on Pocahontas and there does not seem to be any surplus in the mine-run sizes. There is neither a shortage nor a surplus in the prepared sizes. Kentucky operators are reported in good shape and are getting higher prices for their product than for several years. West Virginia coal is stronger than a month ago. Mine-run is selling at 90c. and $1. Domestic 4-in. lump which a few weeks ago was bringing $1.25@1.50 is now selling at $1.50@1.75.

CINCINNATI

In spite of warm weather and small demand, the short car supply has resulted in a scarcity of fuel. No prospects for improvement in sight.

The car shortage is now the one big factor in the coal market. In some cases no cars at all were obtainable the latter part of the week, although conditions showed some improvement earlier. The betterment was short-lived, however, giving way to even a greater scarcity. Failure to return cars from the Northwestern territory seems to be the principal difficulty just now, although it is also true that immense traffic requirements have found the railroads unprepared.

DETROIT

Steam coal trade is less active. Warm weather continues to check domestic business and delay anthracite distribution. Lake trade is light.

Bituminous—Inquiries and orders for steam coal have become less urgent. It is not a serious lapse, but rather a sort of easing off, which is not expected to continue long, or largely reduce the volume of sales. Weather conditions continue unfavorable to steady expansion in the trade. Orders are straggling and for small amounts, while retail yards seem well supplied with stock.

Speculative shipments are greatly diminished and are not a disturbing factor in prices. Fine coal is sold readily, though lump and egg is less easily moved and at intervals is sold below schedule.

Anthracite—Deliveries of anthracite are delayed by warm weather. Retail yards are liberally supplied and little business is going to the shippers. Shortage of cars in the producing districts is causing some delays which are expected to increase later in the season.

Lake Trade—With iron ore shippers increasing season schedules, and high carrying rates in the grain trade, vessel owners are striving to increase dispatch on downbound freight. The coal movement is now restricted almost entirely to contract vessels, except in the case of small cargoes to ports not on regular routes.

LOUISVILLE

Trade continues to expand but prices are still under some pressure due to mild weather.

The past week has brought a good increase in activity and given considerable buoyancy to the Kentucky coal market. Mild weather is holding up any advance in prices on domestic sizes, although the trade will endeavor to put another ten cents on for November. Steam coals are better and numerous inquiries, together with prospective big purchases, are productive of optimism. Car shortages are still curtailing operations.

Eastern Kentucky coals have sold, f.o.b. mines, long ton basis, from $1.75 to $2.10 for the block and $1.25 to $1.50 for egg. In western Kentucky, lump coal is selling above and below $1.25. Some improvement has been noted in the steam coal situation due in a large part to the fact that the Illinois Central has been taking run-of-mine coal instead of mixed as heretofore.

BIRMINGHAM

Coal business still improving, particularly on lump coal. Car supply outlook acute.

A substantial improvement is being felt, both on steam and lump but, especially on the latter, and a few cool days will give the operators about all they can do to fill orders. The tonnage being moved on steam coal is larger than for some time, and the prospects are good for a steady improvement, though the car supply is giving some trouble, and the operators will be seriously handicapped within thirty days unless conditions improve in this line.

COKE

CONNELLSVILLE

Spot furnace coke high. Foundry coke advanced. Production and shipments at new record rate for the year.

There have been a number of sales of strictly spot furnace coke in the past ten days at $2.75, but there has usually been some coke that could be picked up at around $2.60, the top price usually being paid only when the seller could give car numbers. Not much has been done by way of contracting for next year, the bulk of the expiring contracts having already been taken care of. The Youngstown Sheet & Tube Co. will have occasion to buy for its four furnaces, requiring about 18,000 tons per stack per month, but only for about four months of the year, as the company's byproduct ovens are expected to be completed about May 1.

Foundry coke has been advancing rather sharply. Several sales of carloads for prompt shipment have been made at $3, and in one instance at $3 to a dealer, this not including the 15c. brokerage the dealer is supposed to make. The amount of coke available at less than $3 seems to be limited, though there is some. Operators making a specialty of high-grade foundry coke are disposed to ask sharp advances on contracts for the first half of next year, and one leading operator has already fixed a minimum of $3.25. Last May and June there was much relatively cheap foundry coke offered, by producers who did not cater particularly to the foundry trade, and such operators are much less disposed to figure in the foundry coke market at present, when furnace coke is in such demand. There will probably be a fair amount of contract business come up in foundry coke, as when contracts were made last May and June most of the operators made more or less of an attempt to induce buyers to be content with six month contracts, to Jan. 1. We quote: Prompt furnace, $2.60@2.75; contract furnace,$2.25@2.50; prompt foundry, $2.90@3; contract foundry, $2.90@3.25, per net ton at ovens.

The "Courier" report production in the Connellsville and lower Connellsville region in the week ended Oct. 23 at 428,319 tons, an increase of 7,228 tons, and shipments at 437,548 tons, an increase of 14,903 tons.

Buffalo—This market is unable to keep pace with the feverish state of the coke market, as reported from the ovens. Some of them quote prices that could be obtained here and some refuse to quote at all. Advances are reported day by day. It is true that the extreme scarcity of cars is the reason for much of this. Buffalo quotes best foundry at $4.85 and stock at $3.75.

Chicago—Foundry coke shows advancing tendencies, and byproduct sizes are strong at higher prices. Connellsville is up to $5.50, and quotations at this price are only made for immediate acceptance. Some coke shippers are asking fictitious prices to prevent placing of orders. Prices per net ton f.o.b. cars Chicago are as follows: Byproduct foundry, $5.25 to 5.50; byproduct domestic, $5.25; Connellsville, $5.50; Wise County, $5 to 5.25; gas coke, $4 to 4.25.

Birmingham—On account of the large number of blast furnaces operating in this district, the coke market is stronger than it has been for two years, several large contracts having been closed recently on furnace coke at satisfactory prices to the manufacturers, shipments to extend over the next twelve months. Foundry coke shows some improvement also.

MIDDLE WESTERN

GENERAL REVIEW

Warm weather prevails all week. Domestic demand easier. Screenings maintain their strength. Prices firmly held.

Demand has not undergone any expansion since last report because of the mild weather. The retail trade is quiet in the city, but some country dealers have taken cognizance of the deficiency in railroad equipment and commenced to put in reserve stocks. Demand for steam sizes is more active and screenings if anything are stronger. Prices on all grades are holding steady at schedules. Far-sighted manufacturing interests are showing some inclination to accumulate stocks but many industries not having facilities for storage are obliged to buy on a hand-to-mouth basis and will undoubtedly pay the penalty later. Consignment coal on tracks is practically nil.

If the warm weather continues another week, some operators will curtail output rather than reduce prices. Heavy production has not had any evil effects as yet, because reserve stocks are small. Considerable pressure is still exerted on some shippers for contract deliveries, and more than the usual amount of contract coal has been moving at this time. Many shippers had a considerable accumulation of orders on their books which they have been filling during the past week because of the lull in demand. Farmers are taking advantage of the fine weather to move their crops to market, and country dealers report increased buying in this trade.

CHICAGO

Milder weather brings out some concessions, but market generally well maintained. Shippers catching up on delayed deliveries. .Steam continues active, manufacturing concerns showing more interest.

Slight concessions have been made by some of the Franklin County operators to move the coarser sizes, because of a lull in demand and extraordinary heavy production. Screenings are selling higher, and in the last two days have averaged 60c. Egg is lagging, and No. 1 nut is falling behind. It is very likely output will be curtailed to meet the market situation if warm weather continues. Large piles of fine coal are now being dumped on the ground at Franklin County mines. Williamson County coals are in good demand with prices unchanged. Saline County screenings show greater strength.

Springfield mines have about covered all unfilled orders for domestic sizes. Screenings are a trifle softer, the prevailing price being approximately 45c.

The demand for Indiana steam coal is more urgent, due to inadequate car supply; the larger mines have been losing an average of one day weekly through this cause. Orders for domestic sizes have eased off somewhat, owing to moderating weather. The price position of all Indiana coals except egg and nut is strong, and colder weather will see marked advances.

While production of West Virginia coals is reported to be reaching unprecedented proportions, the demand continues to grow for both domestic and steam sizes, and many contracts are now being completed. The Western demand is not quite as brisk, but there is about enough coal coming into the market to meet requirements. Splint lump has been reaching the high level of $1.90 during the last week. Pennsylvania smokeless is bringing about the same price as the West Virginia product, and owing to car shortages the minimum tonnage is reaching this market.

The Hocking market is strong, and recent advances in the circular have been well maintained. Increased buying of steam sizes is a prominent feature while the domestic trade is brisk. The better grades of Hocking lump are now touching $1.75, and mine run is not sold below $1.15, many orders being filled at $1.25. Screenings are strong.

Kentucky coals are now well sold up on every size, and car and labor shortages are curtailing production. Block commands from $1.75 to $2.25, and shipments of the coarse sizes are rapidly falling behind orders.

Anthracite orders have receded in conformity with weather conditions. October prices are being quoted in Chicago for November shipments. Current orders are being filled with little delay.

Quotations in the Chicago market are as follows:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump	$1.65@1.75	$1.60@1.75	$1.50@1.60	$1.35@1.50	$1.40@1.60
Steam lump	....	1.25@1.35	1.20@1.30	1.20@1.25	1.25@1.35
2½ and 3-in. lump	....	....	1.40@1.50	1.35@1.40	1.30@1.40
1¼-in. lump	....	....	1.30@1.35	1.15@1.25	....
Egg	1.65@1.75	1.50@1.60	1.10@1.20	1.20@1.30	1.15@1.25
Nut	1.65@1.75	1.55@1.65	.95@1.05	1.10@1.15	1.00@1.10
No.1washed	1.75	....	1.50@1.60	....	....
No.2washed	1.40@1.50	....	1.40	....	....
No. 1 nut	1.65@1.75	....	....	....	....
No. 2 nut	1.40@1.50	....	....	....	....
Mine-run	1.10@1.15	1.05@1.10	.85@ .90	.95@1.05	.85@1.00
Screenings	.50@ .65	.40@ .55	.45@ .55	.55@ .65	.75@ .80

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.60@1.75	$1.60@2.10	$2.25	$2.00@2.25	$1.60@1.85
1¼-in. lump	1.25@1.30	....	....	1.35@1.50	1.50
Egg	1.60@1.75	1.40@1.75	2.25	2.00@2.25	....
Nut	....	1.35@1.65	1.75	1.40@1.60	1.30
No.1washed	1.75	....	....	....	....
No.2washed	1.40	....	....	....	....
Mine-run	1.15	1.15@1.25	1.25@1.40	1.25@1.40	1.10@1.20
Screenings	.50@ .65	.65@ .75	...	....	.65@ .70

Kanawha 3-in. splint, $1.50@1.90.

ST. LOUIS

Domestic grades weak due to mild weather. Delayed orders well cleaned up and operations less active.

Warmer weather has made the market weaker on the large sizes. Prices are steady in the main, but some sales were made below quotations. All back orders have been cleaned up and fewer mines are in operation than last week. Screenings, under the reduced output, have strengthened 5 to 10c. In spite of balmy weather general conditions are better than this time last year and there is less price demoralization, due to exchange of information which prevents over-production.

Quotations f.o.b. mines ranged on the following basis per short ton.

	Frnk. Co.	Wlmson. Co.	Staunton	Standard
6 in. lump	$1.50@1.75	$1.50@1.75	$1.25@1.50	$1.15@1.25
8-in. lump	....	....	....	1.25
2-in. lump	....	....	1.15@1.20	1.05@1.10
3x6 egg	1.35@1.75	1.50@1.55	....	1.00
No. 1 nut	1.50@1.75	1.50@1.75	....	.85
No. 2 nut	1.40@1.50	1.40@1.50	....	.55@.65
No. 1 washed	....	1.65	1.40@1.60	....
No. 2 washed	....	1.25	1.10@1.25	....
No. 3 washed	....	1.25	1.00@1.25	....
No. 4 washed	....	1.20	1.05	....
No. 5 washed	....	.60@.70	.50@.60	....
Screenings	.55@.60	.55@.60	.30@.35	.30@.35

Freight rates: From inner group, St. Louis 57½c., East St. Louis, 37½c. Outer group, St. Louis, 72½c., East St. Louis 52½c.

INDIANAPOLIS

Weather unfavorable for domestic grades, but steam coal trade gaining in volume. Increase in mine operations. Prices hold firm.

At the present rate of improvement, it is expected that full running schedules will be in effect before this month expires. October weather was mild and this cut down the demand for domestic grades perceptibly. Steam grades continue to move well to railroads and manufacturing plants and further improvement is expected in this department. The transportation companies have been able to keep enough cars at the mines, but it seems to be some effort to do it and this probably presages trouble later on.

Screenings sell for 50 to 65c., according to destination, as well as conditions of sale and shipment. No. 4 screenings have not fallen below 80c., f.o.b. mine. Most contracts for domestic grades have been filled and consumers are ready for cold weather. Retail prices, like mine prices, are unchanged from the level recently prevailing.

DULUTH

Docks continue active, although lacking the stimulus of cold weather. Receipts show no change. Prices are firm.

Shipments continue at the recent high level and the market is strong. No announcements as to any changes in prices have yet been made but coal men generally anticipate an advance in the very near future. The retail trade is taking a fair volume although the mild weather has curtailed business in this direction to some extent. Larger purchases by the railroads are noted and a fair tonnage has moved to their storage points in the Northwest. Receipts show no material changes, but it is believed that from now to the close of navigation receipts will be larger. Quotations per short, ton f.o.b. cars, docks, at Duluth are as follows:

	Yough	Splint	Hock	Smokeless	Elkhorn
Lump	$3.40	$3.40	$3.40	$4.75	$3.75
Dock run	3.10	3.10	3.05	3.25	3.25
Stove or nut	3.40	3.40	3.40	4.75	3.65
Screenings	2.40	2.40	2.25	2.75	2.40

No great activity is noted in the anthracite trade, but the volume of business is well maintained despite the mild weather that has prevailed throughout the entire Northwest for the past ten days. Quotations are as follows: Egg and stove, $6.85; nut, $7.10; pea, $5.55 and buckwheat, $4, all f.o.b. cars, per short ton, at Duluth.

KANSAS CITY

There is a stronger demand for domestic coal and an increase of 5c. in the price of mine-run. The dealers take orders subject to delay and cannot promise shipment within two weeks. It is impossible to get any semianthracite and the larger companies are refusing orders for that coal at $3. The demand from the steam users has fallen off slightly. The outlook is particularly promising.

PORTLAND, ORE.

Mild weather delays heavy business in coal for domestic purposes and trade is only moderately active.

Mild weather continues here and the demand is light so far this fall. Dealers do not look for any heavy movement until there is a decided change in the weather. There has been no change in prices here for several weeks and none is likely. So far there is no indication of any coal being brought here from Australia the coming winter, although several cargoes are reported on the way to San Francisco.

FOREIGN MARKETS

GREAT BRITAIN

Exports—British exports for September and the first nine months of the past three years were as follows:

To	September 1913	September 1914	September 1915	Nine Months 1913	Nine Months 1914	Nine Months 1915
Russia	668,472	17,398	3,173	4,462,660	3,066,925	38,668
Sweden	394,314	633,546	195,722	3,275,151	3,055,335	2,091,047
Norway	174,861	233,754	224,461	1,688,549	1,907,090	2,096,675
Denmark	275,724	405,842	291,764	2,213,216	2,267,312	2,522,950
Germany	833,326	....	....	6,783,574	5,256,765	....
Netherlands	154,904	276,031	174,996	1,544,894	1,457,102	1,329,239
Belgium	164,448	44,416	....	1,546,634	1,084,401	....
France	1,040,489	569,667	1,687,755	9,567,410	9,040,744	13,224,756
Portugal[1]	100,840	87,177	96,766	1,030,124	923,186	787,422
Spain[4]	270,678	227,401	155,553	2,745,182	2,458,578	1,551,630
Italy	810,994	697,093	558,638	7,150,025	6,557,270	4,402,998
Aus. Hung.	53,761	....	....	796,407	564,362	......
Greece	76,091	19,264	6,856	507,251	489,748	280,054
Roumania	30,103	....	....	149,517	218,218	....
Turkey	51,501	....	....	184,954	417,437	10,324
Algeria	66,505	39,733	91,738	952,241	780,627	726,326
Portugal[5]	18,624	37,824	5,405	190,082	153,286	150,422
Chile	27,204	8,040	271	457,641	360,391	38,655
Brazil	158,896	59,528	11,951	1,445,749	966,618	424,282
Uruguay	65,642	18,866	22,120	568,142	480,522	252,358
Argentine	267,142	153,016	132,448	2,725,303	2,362,722	1,289,440
Channel Is.	14,509	19,915	14,840	121,833	127,223	100,460
Gibraltar	14,940	24,447	27,689	254,791	239,206	269,784
Malta	36,249	13,649	5,927	506,361	311,041	114,494
Egypt[2]	258,232	133,177	136,000	2,259,230	2,193,888	1,080,435
Aden[3]	22,930	22,125	5,095	127,678	118,850	110,889
India	8,827	9,222	5,005	125,832	127,261	23,085
Ceylon	25,601	17,969	....	174,358	223,037	38,730
Miscell'ous.	111,373	89,488	37,860	962,999	907,204	459,089
Coke	125,356	130,264	108,471	838,055	824,325	684,689
Briquettes	179,041	107,001	96,133	1,542,365	1,431,938	960,636
Total	6,501,578	4,096,453	4,096,637	56,898,208	50,372,612	35,059,537
Bunker	1,825,057	1,332,935	1,064,967	15,545,617	14,581,962	10,722,894

[1] Includes Azores and Madeira. [2] Including Anglo-Egyptian Sudan. [3] And dependencies. [4] And Canaries. [5] West Africa.

Note—The figures in the above table do not include Admiralty and certain other shipments.

PRODUCTION AND TRANSPORTATION STATISTICS

BALTIMORE & OHIO

The following is a statement of coal and coke tonnage moved over this system and affiliated lines during September and the previous two months:

	July 1915	July 1914	August 1915	August 1914	September 1915	September 1914
Coal	2,887,918	2,594,407	3,009,028	2,769,45	3,034,271	2,878,963
Coke	344,557	255,650	345,258	242,28	331,224	237,661
Total	3,232,475	2,850,057	3,354,286	3,011,73	3,365,495	3,116,624

NORFOLK AND WESTERN

Destination of shipments over this road for September and the nine months of this year and the last year were as follows, in short tons:

	September		Nine Months	
Coal	1914	1915	1914	1915
Tidewater, foreign	334,205	430,053	1,587,552	3,064,596
Tidewater, coastwise	347,571	259,128	2,917,784	2,439,292
Domestic	1,828,140	2,255,551	15,474,771	16,130,141
Coke				
Tidewater, foreign	142	4,621	339	23,080
Domestic	58,970	71,762	807,104	645,198
Total	2,569,028	3,021,115	20,787,550	22,302,307

MIDDLE WESTERN ROADS

The following is a comparative statement of coal handled over the 17 principal Middle Western railroads for August and the first eight months of this year, compared with the same periods last year:

	August		8 Months	
	1914	1915	1914	1915
Illinois Central R.R.	790,530	637,650	4,774,645	4,634,390
C. & E. I. R.R.	562,732	498,832	4,333,519	3,750,660
C. B. & Q. R.R.	494,762	492,260	3,463,628	3,310,311
C. C. C. & St. L. R.R.	423,233	412,072	3,047,543	3,151,229
Vandalia Line	376,230	357,496	2,784,502	3,072,115
C. T. H. & S. E. Ry.	237,177	226,343	1,945,975	1,934,189
C. & A. Ry.	142,011	158,676	1,123,329	1,202,516
Wabash R.R.	150,905	119,741	937,827	989,121
St. L. I. M. & S. Ry.	157,107	142,646	978,768	976,729
Southern Ry.	115,755	88,521	1,019,042	705,290
B. & O. S. W. R.R.	54,952	75,535	465,408	623,531
St. L. T. & E. R.R.	69,914	49,696	428,248	380,663
St. L. & O. F. Ry.	45,372	50,829	334,368	400,542
L. & M. Ry.	43,306	34,445	296,298	299,440
C. I. & L. Ry.	38,100	57,465	382,605	426,078
C. P. & St. L. Ry.	28,690	27,967	221,244	260,074
C. & N. W. Ry.	22,317	30,675	203,510	262,904
	3,832,146	3,460,849	26,740,459	26,379,782

CHICAGO LAKE RECEIPTS

Coal receipts at the Port of Chicago and South Chicago, classified by shipping points, for the month ending Oct. 31:

	1915		1914	
From	Hard	Soft	Hard	Soft
Buffalo	71,088	16,231	92,244	x
Oswego	13,594	x	22,879	x
Ashtabula	x	46,950	7,013	2,600
Cleveland	5,571	43,059	x	14,471
Toledo	x	44,739	x	20,631
Conneaut	x	18,000	x	x
Sandusky	x	22,237	x	x
October total	90,253	191,216	122,136	37,702
Season total	686,897	711,672	654,513	571,910

I. C. C. DECISION

Investigation and Suspension Docket No. 661—Allowances on anthracite coal at Hauto and Nesquehoning, Penn.

The Central Railroad Co. of New Jersey proposed by the tariffs under suspension to pay to the Lehigh Coal and Navigation Company certain lateral allowances out of the rates on shipments of anthracite coal from Hauto and Nesquehoning, Penn.; Held, That the allowances would effect unlawful discrimination and constitute unlawful rebates. Tariffs ordered canceled.

I. C. C. No. 6821—David Rutter & Co., vs. Chicago and North Western Railway Co., Et. Al.

Upon complaint that defendants have been and are assessing unlawful, unreasonable, and discriminatory charges on carload shipments of coal from eastern mines to complainant's yard at Evanston, Ill., Held:

1. In the absence of joint rates or a specific manner of constructing through rates the lowest combinations via the routes of movement are the lawful rates.

2. The lawful through rates from eastern mines to Evanston were and are the rates to Greenwood street station, plus the local distance rate of the Chicago & North Western to Evanston and a reconsigning charge under the conditions named in the tariff, except that where rates to Greenwood street station are limited by tariff to shipments unloaded there the combination is made on Chicago instead of on Greenwood street station.

3. The allegation of unjust discrimination is not sustained by the record.

4. The traffic here involved is through traffic and the reasonableness of the rates applicable thereto must be considered from the standpoint of the through rates in their entirety. So considered, the evidence does not show that they are unreasonable.

5. Defendants directed to refund all overcharges to complainant, with interest.

I. C. C. No. 6849—Atlas Coal and Coke Co. vs. Pennsylvania R.R. Co., Et Al.

Charges collected for the transportation of a carload of coal from Viola Colliery No. 1, Penn., to Calvert yard, Baltimore, Md., reconsigned to Canton Diers, Baltimore, Md., not found to have been unreasonable. Complaint dismissed.

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

+Indicates contracts regarding which official information has been received.

New Business

+1611—Williston, N. D.—The County Government will receive bids until 9 a.m., Nov. 22, for furnishing coal as may be required at the Court House and Jail during the ensuing year. All bids must be accompanied by a certified check for $50. Address County Audr. M. H. Aaen, Williston, N. D.

+1612—Aliquippa, Penn.—The Village Government received bids until 7 p.m., Nov. 1, for furnishing approximately 500 bu. of 1¼-in. lump coal to be delivered at the Municipal Building. Address Secy. L. S. Patton, Aliquippa, Penn.

+1613—Knoxville, Tenn.—The City Government will receive bids until noon Nov. 8, for furnishing coal and coke as may be required during the coming fiscal year. Bids must be submitted according to specifications on file at the Recorders Office. Address Recorder R. P. Williams, Knoxville, Tenn.

+1614—Hackettstown, N. J.—The Building Committee of the Board of Education received bids until 8:30 p.m., Oct. 28, for furnishing approximately 150 tons of Scranton pea coal to be delivered as required at the Public School Building. Address Wallace Taylor, Bldg., Com., Bd. of Edu., Hackettstown, N. J.

1615—Philadelphia, Penn.—S. B. & B. W. Fleisher, Inc., consume approximately 2,550 tons of buckwheat coal per annum, for which they usually contract some time in December. Deliveries are made by railroad, at the rate of 50 tons per week and the company has storage capacity for 300 tons. Address, Pur. Agt. A. A. Fleisher, Main and Rector St., Philadelphia, Penn.

+1616—Houston, Tex.—The Harris County Government will receive bids until 10 a.m., Nov. 10, for furnishing the Harris County Boys School at South Houston and the Harris County School for Girls at Bellaire with coal as may be required during the coming season. Address County Audr. H. L. Washburn, Houston, Tex.

+1617—Brooklyn, N. Y.—Bids will be received by the Borough of Brooklyn until 11 a.m., Nov. 11, for furnishing and delivering aproximately 3,300,000 lb. of anthracite coal to the various public buildings, courts and baths, delivery to be completed by the end of the current year. The bids will be awarded in a lump sum, and deliveries will be as required. Blank forms and complete details may be had on application. For data covering the previous award on this contract, see Vol. 6, p. 1009, Vol. 7, p. 108. Address, Pres. L. H. Pounds, Bureau Public Bldgs. and Offices, Room 1003, 50 Court St., for further information and address bids to L. H. Pounds, Room 2, Borough Hall, Brooklyn, N. Y.

1618—St. Louis, Mo.—St. Louis Dressed Beef and Provision Co. is receiving bids for furnishing 600 tons of screenings per week. Address, Pur. Agt. J. M. Weiser, 3919 Papin St., St. Louis, Mo.

1619—Pleasantville, N. J.—The Atlantic County Board of Freeholders received bids until 11 a.m., Nov. 4, for furnishing 200 tons of Lehigh Valley pea and 150 tons stove coal. Deliveries are to be made at Dolphin Sta. on the P. R.R., as required. The coal is for use at the Asylum and Almshouse. Address, Supt. T. L. McConnell, Pleasantville, N. J.

1620—Missoula, Mont.—The Missoula Light and Water Co., contract some time in December for their annual requirements of coal, involving approximately 9,000 tons slack and nut. Deliveries are made by railroad at the rate of from 300 to 1500 tons a month, and the company has storage capacity for 600 tons. Coal from the Roundup mines is supplying the present contract. Address, Pur. Agt. C. H. Christensen, Missoula Light and Water Co., Missoula, Mont.

1621—Columbus, Ohio—The Ruggery Building is in the market for approximately 300 tons of nut, pea and slack or coarse slack coal. Deliveries are to be at the rate of 50 tons per month during the winter months. Bids will be received on either Hocking Valley of West Virginia coal. For previous announcement of the old contract see contract 1, Vol. 6, p. 655. Address Supt. J. W. Lehman, 60 Ruggery Bldg., Columbus, Ohio.

+1622—Spokane, Wash.—The City Government will receive bids until 11 a.m., Nov. 18, for furnishing approximately 600 tons of coal as may be required during the ensuing year. Deliveries are to be in carload lots and slack, mine-run and Nos. 1 and 2 lump are required. Three separate bids are to be submitted, one to the Mayor, one to the City Clerk, and the third to the Purchasing Agent, and bids must be accompanied by a certified check for 10% of the amount bid. Address Purchasing Agent, City of Spokane, Spokane, Wash.

+1623—Lawton, N. D.—The Lillehoff School District will receive bids until Nov. 8 for furnishing Youghiogheny coal as may be required by the local schools during the ensuing year. Address Clk. H. W. Swanson, Lillehoff School Dist., Lawton, N. D.

Contracts Awarded

Note—Successful bidders are noted in **bold face type.**

+1388—Carlisle, Penn.—This contract (p. 447), which provides for furnishing the Carlisle School District with approximately 200 tons of standard Quemahoning coal, has been awarded to **J. E. Williams** at $3.30 per ton, delivered in the cellar. The distribution of the cost is as follows: Coal, $1.35; freight, $1.50; haulage, 45c. Address Chm. C. M. Liggett, Property Com., Carlisle, Penn.

+1503—Covington, Ind.—This contract (p. 577), which provides for furnishing Fountain County with coal, has been awarded to **Dick Sheaks** as follows: 200 tons for the County Farm, at $2.28 per ton f.o.b. the farm; 100 tons to the Court House, at $2.78; 60 tons to the Jail, at $2.65. Address Audr. Hyman W. Newlin, Fountain County, Covington, Ind.

1540—Davenport, Iowa—This contract (p. 617), which provides for furnishing the local Public Library with coal, has been awarded to the **Mueller Lumber Co.** at $2.93 per ton for 6-in. lump. There were six other bids on this business ranging from $2.94 to $3.25 per ton. Address Librarian, Davenport Public Library, Davenport, Iowa.

+1541—Scranton, Penn.—This contract (pp. 617, 699), which provides for furnishing the local Board of Education with proximately 2,000 bu. of mine-run coal to the high school, has been awarded to the **James J. Kearney Coal Co.**, at $2.40 per ton. Address Secy. G. E. Haak, School Bd., Administration Bldg., Scranton, Penn.

+1550—South Fork, Penn.—This contract (p. 660), which provides for furnishing the local School Board with mine-run coal as may be required, has been awarded to **Frank Hays** at $1.70 per ton. Address Secy. J. C. Penrod, Sch. Bd., South Fork, Penn.

+1552—Larksville, Penn.—This contract (p. 660), which provides for furnishing coal to the various local school buildings, has been awarded to **John Dwyer** on the following basis: Pea, $3.35; nut, $4.35; stove, $4, all per gross ton. Address Secy. Thomas Heffernan, Bd. of Edu., Larksville, Penn.

+1558—California, Penn.—This contract (p. 661), which provides for furnishing the local Public Schools with approximately 2,000 bu. of mine-run coal, has been awarded to the **Lilley Coal and Coke Co.** at 6½c. per bu. Address Secy. W. J. Weaver, California School Bd., California, Penn.

+1561—Le Mars, Iowa—This contract (p. 661), which provides for furnishing the Plymouth County Board of Supervisors with coal for the Court House, Jail and Poor during the year beginning Oct. 15, has been awarded to the **M. A. Moore Co.,** at $4.68 for Illinois lump. Other bids on this business were: Farmers Co., Lincoln County, 1¼x¾-in., for $4 45; same, lump, $4.95; W. F. Remer, Illinois lump, $4.85; Lambert Lumber Co., $5. Address County Audr. J. M. Hayes, Le Mars, Iowa.

+1562—Lewistown, Penn.—This contract (p. 661), which provides for furnishing and delivering anthracite coal as may be required at the various hose houses and town halls during the coming season, has been awarded to the **H. B. Montgomery Estate** on No. 2 coal at $5.40 per net ton. Address Secy. J. Harry Saxton, Lewistown, Penn.

1564—Cleveland, Ohio.—This contract (p. 661), which provides for furnishing the Outdoor Relief Department with coal as may be required during the ensuing year, has been awarded to the **Zettlmeyer Coal Co.,** at $2.94 per ton. Address Comr. A. R. Callow, Purchaser of Supplies, 511 City Hall, Cleveland, Ohio.

+1580—Fort Slocum, N. Y.—This contract (p. 700), which provides for furnishing the Government with coal for the steamer "General Barry" as may be required during the period beginning Nov. 1 of the current year, and ending June 30 next year, has been awarded to the **Commercial Coal Co., Inc.** (29 Broadway, New York City), at $3.39 per ton. This company was the only concern that submitted a bid for delivery in bins at Fort Slocum. Address Capt. S. E. Smith, Quartermaster Corps, U. S. Army, Fort Slocum, N. Y.

Contract Notes

San Diego, Calif.—About 25,000 tons of anthracite coal per annum is consumed for domestic purposes in this city. The average price is $12 per ton.

Pittsfield, Mass.—The City Government at this place consumes about 1,500 tons of anthracite coal which they buy locally on contracts. Address City Council, Pittsfield, Mass.

Piedmont, Ala.—The City of Piedmont consumes approximately 700 tons of bituminous mine-run per annum, which is bought at about $2 per ton. Address, Geo. H. Haslam, Piedmont, Alta.

Saxton River, Vt.—The Saxton River Woolen Co. consumes about 75 tons of coal per month. Deliveries are made by electric railroad and they have a storage capacity of 100 tons. Reynoldsville coal is being used on the present contract.

Trinidad, Colo.—The Trinidad Electric Transit Railway & Gas Co. consumes about 50,000 tons of bituminous coal per annum. The average price is about $1 per ton, and the present supplies are being furnished on a 10-year contract.

Boston, Mass.—Cocheco Woolen Mfg. Co. consumes about 200 tons of Georges Creek per month. They have a storage capacity for 1,200 tons and deliveries are made by rail. Address Pur. Agt. Samuel Rindge, 4 Winthrop Square, Boston, Mass.

Mt. Vernon, N. Y.—The Department of Public Instruction at this place buys about 1,700 tons of anthracite egg and pea coal. The call for bids is advertised and the business goes to the lowest bidder. Address E. Q. Bienvenu, Dept. of Pub. Instruction, Mt. Vernon, N. Y.

Bluffton, Ind.—The Bluffton Electric Light & Water Works consumes about 7,000 tons of nut and slack coal per annum. Purchases are made in the open market, and the usual price is about 65c. per ton. Address Supt. C. W. Clark, Bluffton Electric Light & Water Works, Bluffton, Ind.

Indianapolis, Ind.—The Indianapolis Light and Heat Co. consumes about 125,000 tons of Indiana mine-run and slack coal per annum. The present requirements are being filled on a 5-year contract at about $1.40 per ton. Address C. C. Perry, Indianapolis Light and Heat Co., Indianapolis, Ind.

Ft. Morgan, Colo.—The Municipal Light and Power plant at this place consumes approximately 3,300 tons of lignite slack and mine-run coal per annum. Purchases are confined to the open market, and the usual price is $2.10 per ton on track at Ft. Morgan. Address, Supt. Geo. G. Cox, Municipal Lt. and Water Plant, Ft. Morgan, Col.

Boston, Mass.—The contract for furnishing the City Hospital and the Calf Pasture Pumping Station with coal has been awarded to the **Northern Coal Co**. on New River coal at $3.89 for delivery at the City Hospital and $4.07 at the pumping station. The contract involves 12,500 tons and the complete list of bids made was as follows:

	City Hospital	Calf Pasture
New England Coal and Coke Co. (New River).	$3.97	$4.16
Metropolitan Coal Co. (New River)........	4.09	
Gorman Leonard Coal Co. (New River)......	4.10	
Darrow-Mann Coal Co. (New River)........	3.98	4.16
Northern Coal Co. (New River)..............	3.89	4.07
Spring Coal Co., Long Branch and Willis Mines.	3.82	4.19

For announcement of previous contract of the Metropolitan Water and Sewerage Board see contract No. 772, Vol. 7, Page 956. Address Secy. William N. Davenport, Metropolitan Water and Sewerage Board, No. 1 Ashburton Place, Boston, Mass.

Financial Department

Consolidation Coal Co.

This company reports in substance, for the fiscal year ended Dec. 31, 1914, as follows:

The shareholders on Jan. 30, 1915, authorized an increase of $8,000,000 in the limit of issue of capital stock and also an issue of $7,000,000 7% 2-year debentures, with interest payable only upon the maturity of the principal and convertible (*a*) at maturity Feb. 1, 1917, at company's option, principal and 14% interest, into capital stock or (*b*) prior to maturity at holder's option at par and interest to date of conversion as part subscription for an amount of new stock equal to 114% of the bonds held by him. The issue has been underwritten by New York bankers.

Coal Mined by the Company and Its Subsidiaries, by Divisions

	Maryland	West Virginia	Pennsylvania	Mill Creek	Elkhorn	Total Gross	Net Tons
1914.	1,992,342	4,160,041	1,777,355	495,950	1,136,827	9,562,515	10,710,017
1913.	2,127,131	4,656,640	1,743,536	459,202	973,302	9,959,811	11,154,989
1912.	2,162,996	4,576,484	1,748,091	522,900	228,011	9,238,482	10,347,100
1911.	2,178,391	3,925,329	1,671,639	456,544	....	8,231,903	9,219,731

The coal mined by lessees in the Maryland, West Virginia and Pennsylvania divisions aggregated 537,568 net tons, against 537,871 in 1913.

RESULTS FOR YEAR ENDING DEC. 31 (INCLUDING SUBSIDIARIES)

	1914	1913	1912	1911
Coal mined	9,562,515	9,959,811	9,238,482	8,231,903
Coke manufactured	58,202	76,050	62,647	43,740
Coal mined by lessees	479,971	480,242	536,401	473,008
Gross earnings (mining) Int. and divs. on sec. owned	$14,828,981	$15,443,246	$13,708,564	$11,420,694
			811,853	311,431
Total gross earnings	$14,821,981	$15,443,246	$14,520,417	$11,732,125
Operating expenses			9,896,157	x8,467,662
Taxes			220,215	222,194
Interest and exchange	$11,022,090	$11,281,655	62,092	22,437
Insurance			39,424	41,803
Royalties			212,847	172,343
Deprec. mining plant			247,508	221,618
Deprec. misc. equipment	414,245	334,888	95,284	78,999
Total	$11,436,335	$11,616,543	$10,773,527	$9,227,056
Net earnings	3,392,646	3,826,703	3,746,890	2,505,069
Int. on Cons. Coal bds.	1,113,576	1,085,894	639,225	517,084
Int. on sub. cos. bonds			334,858	355,926
Sink. fd. cons. coal bds.	167,633	174,120	162,958	153,618
Sink. fund sub. cos. bds.	101,704	106,960	106,492	94,605
Cash dividends (6%)	1,500,000	1,500,000	1,358,865	1,201,513
Total deductions	$2,882,913	$2,866,974	$2,602,398	$2,322,746
Balance, surplus	509,733	959,729	1,144,492	182,323

x Cumberland & Pennsylvania R.R. depreciation amounting to $108,230 in 1911, and insurance, $3,544, is charged to operating expenses in accordance with Inter-State Commerce Commission classification.

COMBINED GENERAL BALANCE SHEET, DECEMBER 31

Assets	1914 $	1913 $	Liabilities	1914 $	1913 $
Property accts.a	52,117,956	51,333,115	Capital stock	31,190,500	31,190,500
			Bonded debt	23,112,000	22,729,000
Adv. payments on coal land pur.	1,797,075	1,569,900	Convertible 6s	6,500,000	6,500,000
Due from 1st and ref. mtge. trus.	b89,685	240,339			
			Car trust bonds—assumed by C. & P. R.R.	304,000	380,000
Stock reserved for convers'n of 6s secured bonds	6,190,500	6,190,500	Purchase money obligations	2,615	5,995
			Bills payable	2,200,000	950,000
Stocks of allied cos c	906,888	3,906,888	Accounts payable	582,633	430,431
Other investments	306,007	116,400	Pay-rolls	183,029	205,477
Sinking funds	821,614	806,926	Royalties payable	77,346	223,574
Bonds in treasury	708,000	....			
Coal and coke	526,224	490,969	Bond interest and dividends due	50,331	49,536
Mat'ls. supp., etc.	1,081,638	1,416,680	Bond int. accrued	395,246	399,393
Bills receivable	319,055	200,480			
Accts. receivable	5,636,397	4,847,662	Sinking funds accrued	128,235	142,658
Cash in banks, etc.	1,155,228	1,770,806	Dividend payable Jan. 31	375,000	375,000
Cash for bond int. and divs. due	50,331	49,536	Individuals and companies	468,578	806,888
			Profit and loss	d9,213,328	8,774,252
Special deposits to cover royalties	76,243	222,503			
Total	74,782,841	73,162,704	Total	74,782,841	73,162,704

a Property account ($52,117,956) includes: Coal lands and other real estate, $35,291,198; less reserve for exhaustion, $3,149,014; balance, $32,142,184; mining plants and equipment, $18,994,333; less reserve for depreciation, $3,424,949; balance, $15,569,384; Cumberland & Penn. R.R., $3,299,696; less sinking fund for redemption of bonds, $819,627; balance, $2,480,069; Cumberland & Penn. R.R. equipment, $1,885,734; less reserve for depreciation, $656,752; balance, $1,228,982; floating equipment, $1,191,844; less reserve for depreciation, $494,507; balance, $697,337.

b For 75% of cost of improvements, extensions, etc., $75,368, and for expenditures on Northern Coal lands, $14,317; total, $89,685.

c Stocks of other companies owned include 18,900 shares Northwestern Fuel Co. common stock, 5,400 shares Northwestern Fuel Co. pref. stock and 7,513 shares Metropolitan Coal Co. common stock. Of the above, 5,000 shares of M. C. Co. stock and 18,000 of the N. W. F. Co. common stock, together with $6,500,000 1st and ref. M. bonds, are held by Equitable Trust Co. of New York, trustee, as collateral for convertible 6s.

d After deducting $70,657 adjustment of accounts of previous years.

Note—For previous annual report of this company see Vol. 6, p. 168.

The Pacific Coast Co.

This company reports under date of Aug. 27, 1914, as follows:

The past fiscal year has been one of business depression at all points and in all lines of business along the Pacific Coast. There are not as yet signs of any general improvement. Crop conditions and bank deposits are favorable for an improvement during the present year, if other influences do not interfere.

Operating expenses have been reduced as far as consistent with efficient maintenance of the properties. No expenditures for improvements are being made, with the exception of such as are necessary to finish up improvements started during previous years.

PACIFIC COAST COAL CO. (Coal Department)

Gross earnings (decreased)	$320,920.93
Operating expenses (decreased)	149,413.82
Net earnings (decreased)	171,507.11

The total output of the mines during the year was 681,729 tons, which includes 18,240 tons from mines under development; a decrease of 134,875 tons as compared with last year.

The amount of coal sold at all depots was as follows:

From company's mines, tons	657,024
Other domestic coal, tons	32,502
Foreign coal, tons	11,209
Total coal, tons	700,735

a decrease of 155,765 tons as against last year.

The average cost of output from company mines increased 20.6c. per ton. The average selling price increased 16.3 cents per ton.

Note—For previous annual report of this company see Vol. 5, p. 390.

Nova Scotia Steel & Coal

The report of the Nova Scotia Steel and Coal Co. for the year ended Dec. 31, 1914, compares as follows:

	1914	1913	1912	1911
Gross profits	$415,164	$1,255,954	$1,000,610	$1,019,392
Bd. and other int.	601,070	505,135	412,311	351,169
Deficit	185,906	750,819	588,299	668,223
Other charges	213,313	233,132	201,843	217,881
Pfd. divs	41,200	82,400	82,400	82,400
Com. divs	180,000	360,000	360,000	360,000
Deficit	620,419	75,287	55,944	7,942
Prev. surp	527,887	452,600	508,544	500,600
Tr. fr. gen. res	150,000	....	....	....
P. & L. surp	57,466	527,887	452,600	508,544

Note—For previous annual report of this company, see Vol. 5, p. 712.

DIVIDENDS

The following is a list of some of the more important dividends recently announced:

New Central Coal—Dividends of 1%, payable Nov. 1, to holders of records, Oct. 28.

Westmoreland Coal—Dividend of $1.75, payable Oct. 1, to holders of records Sept. 22 to Oct. 1.

Temple Coal Co.—Regular quarterly dividend of 2%, payable Oct. 12, to holders of records Oct. 2.

Pittsburgh Coal Co.—Regular quarterly dividend of 1½%, payable Oct. 25, to holders of records Oct. 15.

Consolidation Coal—Regularly quarterly dividend of 1½%, payable Oct. 30, to holders of records Oct. 23.

Lehigh Valley Coal Sales—Regular quarterly dividend of 2½%, payable Oct. 16, to holders of records Oct. 7.

Alabama Fuel & Iron—Regular quarterly dividend of 1% payable Oct. 1, to holders of records, Sept. 21 to Sept. 30.

Reading Co.—Regular quarterly dividend on the first preferred of 1%, payable Dec. 9, to holders of records, Nov. 23.

Delaware, Lackawanna & Western Coal—Regular quarterly dividend of 2½% payable Oct. 15, to holders of records Oct. 1.

Central Coal & Coke Co.—Regularly quarterly dividend on erly dividend of 2½% payable Oct. 15, to holders of record Sept. 30.

Island Creek Coal—Regular quarterly dividends of 50c. on the common, payable Nov. 1, to holders of records Oct. 23, and $1.50 on the preferred payable Nov. 1, to holders of records Oct. 24.

Burns Bros.—Regular quarterly dividends of 1¾% on the common, payable Nov. 15, to holders of records Nov. 1, and regular quarterly (No. 11) on the preferred of 1¾% payable Nov. 1, to holders of records Oct. 15.

COAL AGE

One of the Hill Engineering Weeklies

Vol. 8 NEW YORK, NOVEMBER 13, 1915 No. 20

Why I Believe In Safety First

Being a CREED *for the* EMPLOYER *and the* EMPLOYEE

Employer:

I BELIEVE IN SAFETY FIRST because, popular ideas to the contrary notwithstanding, I have a soul—a conscience which is torn in sympathy with the torn limbs and bodies of my workmen. ¶ Because, As An Employer, I assumed before God and man the duty of being in part my brother's keeper—his hurt is my hurt, his pain is my pain, the sorrow of his widow and the cry of his children ring in my ears after he is gone. ¶ I Believe In Safety First because waste of human ability and human life is destruction of God's most valuable product on earth, and if I fail to do my utmost to conserve that, I have left undone a *sacred* duty—committed a sin of omission, not only against my kind, but against my Creator, and must certainly give account for my delinquency. ¶ Being A Business-Man I believe in Safety First from a purely business standpoint, as well as because of its humanitarianism. I try to live up to its tenets because it is bad business policy to do otherwise. No dividends accrue to me by way of the hospital, law courts or damage suits, but *preventing* them means money for me and my company. Accident prevention promotes efficiency. ¶ Furthermore, Being In Business, I know the power of advertising my wares and my plant; and living up to the Safety First idea is the best kind of advertisement. I also know that an ounce of publicity from accidents counteracts a pound of the brand furnished by our advertising department, breeds strife, discontent and widens the breach between me and my employees, and that's the worst kind of business policy.

Employee:

I BELIEVE IN SAFETY FIRST because the loss of my ability to labor means suffering for those I love most on earth; it leaves to the mercies of a more or less indifferent world those whom every workman desires most of all to protect. ¶ I Believe In Safety First because it tends to conserve my ability to labor and that ability is my sole capital; losing it, I am bankrupt. ¶ I Believe In Safety First because my safety means the safety of my fellow-workmen. In risking myself I risk others. ¶ I Believe In Safety First because the bread I earn with my own hands is sweeter to me and mine a thousand times than charity in any form.

Both Together:

WE BELIEVE IN SAFETY FIRST because it pays in assurance, comfort, money and health. To the employer it means less worry and a larger ultimate bank account; to the workman it brings assurance of living to enjoy the fruits of his labor. ¶ It Means that mothers shall have the comforts due them in their age; That Wives shall not unnecessarily become untimely widows; That Children shall have fathers to provide for them when they need their care and protection most—when they are young. ¶ It also means that cripples and helpless wrecks who were once strong men shall not be considered a byproduct of industry.

By Sim C. Reynolds

Modern Mine-Plant Design--II

By M. L. Hyde*

SYNOPSIS—This article, which is the second of two on this subject, details the various items of equipment of the surface works.

In a steam plant, turbines as prime movers stand first. Operated noncondensing, these machines require from 35 to 50 lb. of steam per horsepower-hour. When run condensing, they use from 15 to 20 lb., the equal of the best compound engines. When waste or slack which must otherwise be stocked is used as fuel, the noncondensing type is recommended; in other cases, the condensing.

Turbines are lower in first cost than their equal in engines, require less space and smaller and lighter foundations and are easier to erect—units up to 330 kw. coming completely assembled are skidded from car to foundation direct.

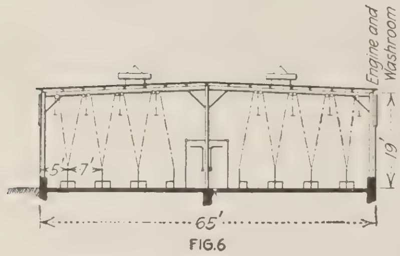

FIG.6

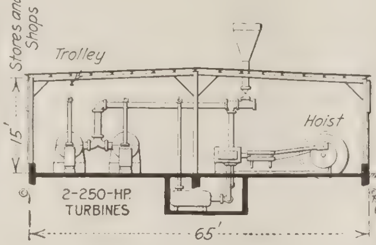

FIG.7

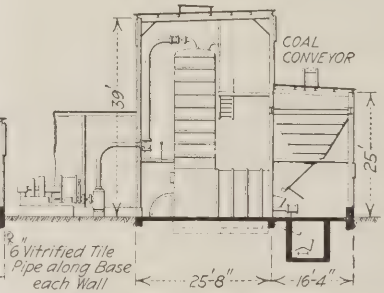

FIG.8

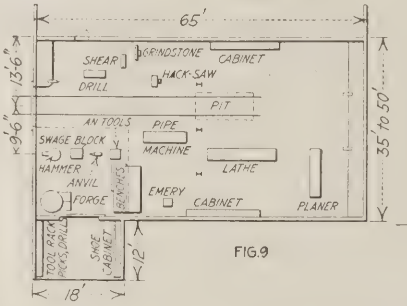

FIG.9

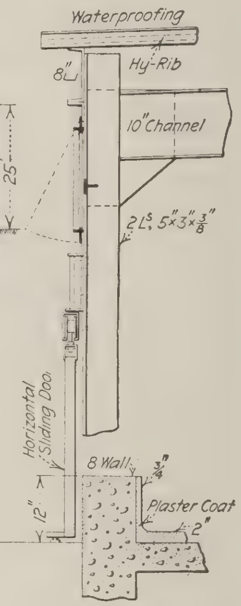

FIG.10

FIGS. 6 TO 10. SHOWING CROSS-SECTION OF WASH HOUSE, ENGINE AND BOILER ROOMS, DETAIL OF WALL CONSTRUCTION AND ARRANGEMENT OF SHOP

Allis-Chalmers, Westinghouse or General Electric turbines meet the mine requirements in every way and are recommended as being of the best types.

When compressed air is required, the vertical high-speed compressors of the Bellis & Morcum type, like this firm's vertical steam engines, stand in a class by themselves, owing to their extreme simplicity, reliability, small amount of power required to operate, noiselessness, small floor space and lower cost erected.

Steam Hoists Are Preferable

Electric hoists are not feasible at a mine generating its own steam. High first cost overrides any small economy that can be expected over even the piston valve, and none need be looked for over engines fitted with corliss valves.

Current from an outside source should cost less than ¾c. per kw.-hr. to compete with coal valued at 90c. per ton, assuming the engine without expansion uses 80 lb. of steam per shaft horsepower per hour and the boilers evaporate 7 lb. of water per pound of coal.

German tests show power consumption of an electric hoist using the Koepe disk with tail ropes (far more efficient than any arrangement of ropes and drums) to be 1.6 kw. per shaft horsepower.

Up to a shaft depth of 600 ft., the flat-faced, single-drum, first-motion hoist is preferable to the conical face with the disadvantage inherent to this style—the risk of the rope jumping its groove.

A safety device should be fitted to every hoist which will automatically close the main throttle as the cage nears the shaft collar and render it impossible to again open this valve until the hoist has been reversed. For raising above the dumping point, an auxiliary throttle may be employed. Among the best types of steam hoists are those manufactured by the Vulcan Iron Works and the Wellman-Seaver-Morgan Co.

It is necessary, when utilizing exhaust steam from the hoist engine, to provide for the periods of lull between hoists. This is done by mixed-pressure turbines, designed chiefly for low-pressure work, their steam supply being protected by means of a large steam receiver partly filled with water, which absorbs heat from the hoist engine's exhaust while hoisting and gives it up during idle periods. The receiver or regenerator may be placed outside the engine room and as close to the hoist and turbines as possible.

Switchboards should be made up of standard marble panels, set well away from the wall, so that they may be easily cleaned and repaired, while a pipe railing surrounds them for safety. Wiring diagrams posted on the wall, with the wires on the board tagged to correspond therewith, will enable anyone to follow the system and locate possible trouble.

Jet Condensers Are to Be Preferred

When sufficient water is available for condensing and it is not necessary to have condensed water for boiler feed, the simple jet condenser is preferable to the surface type.

Boilers of the vertical type are recommended for mine power plants. They are safe, simple, accessible, occupy small floor space, are moderate in cost and, most important, their system of circulation is the correct one.

---

*Pembina Coal Co., Evansburgh, Alta.

An automatic nonreturn valve on each boiler allows cutting out any unit and avoids danger of steam from other boilers flowing into it.

To get from boilers their maximum efficiency, mechanical stokers, mechanical draft and superheaters are essential. Hand-firing and natural draft are the two worst enemies of economy and not to be considered in the modern plant.

Stokers should be of the self-cleaning type to avoid hand work and the admission of cold air while cleaning. It is safer to leave their design as well as that of the draft system and superheaters to the boiler people, letting them install and guarantee this equipment complete, after first submitting them samples of the coal to be burned and the water to be used.

Venturi water meters allow of keeping records of the water consumed and give a basis on which guarantees may be made (when combined with a careful check on the coal burned and cars of ashes removed). Gas analysis and stack temperatures should also be recorded, if the mine is to be in a position to give accurate information on its product.

Steam lines must be extra heavy and well protected with a thick magnesia covering. This insulation should not be put on until steam has been carried for at least a week to enable the engineers to bring all packed joints home. Welded connections, a minimum number of joints and minimum lengths of pipe between units are to be aimed at. All pipes and connections should be accessible on each side for repairs.

Boiler blowoffs must all discharge in one direction and no opportunity be allowed for the blowoff from one boiler to back up on another. The pipes for carrying blowoff steam should be large and so arranged that there is no danger of freezing.

Open feed-water heaters are preferable to the closed type from every standpoint—first cost, saving in heat and water from condensed steam, slow depreciation, accessibility, ability to carry overloads, etc.

Centrifugal Boiler-Feed Pumps Advantageous

Centrifugal pumps for boiler feeding are rapidly becoming the standard type. They give a continuous flow of water without shock or water-hammer, are favorable to boiler-feed regulators and water meters, require but little lubrication, small floor space, are simple and reliable and, when driven by steam turbines, form the most desirable units obtainable.

Fig. 8 shows a section through a plant of good design and requiring a minimum of labor to maintain and operate. Coal is brought from the tipple by means of a Jeffrey cable conveyor (with 9-in. disks on a ⅞-in. cable) to the boiler bunker. This conveyor is set on the roof, allowing of completely housing-in the bunkers to avoid dust. It is motor-driven from the boiler-room floor.

The bunkers are of the Berquist type, combining minimum weight and upkeep expense with maximum life. All steel used is fully exposed and therefore easily kept painted.

From the bunkers the coal flows to stokers, the ash passing to a magazine under the boilers which in turn discharges to ash cars running in a tunnel below the floor.

The boilers are set in batteries of two, and space is left at one end of the room for the draft fan and engine as well as for an overhead platform supporting the hot-blast system. At each end are 10-ft. sliding doors, the opening for which should also be protected by high steel gates.

In the engine room are the turbines, hoist, switchboard, feed-water heater and pumps. The floor is of concrete and should be placed on a level with that in the rest of the building if condensing machinery is not used. Where condensing equipment is employed, the floor of the engine room should be 6 ft. above the floor in the remainder of the building.

Pipe Railings Around Hoist and Switchboard

The hoist and switchboard should be entirely surrounded by a strong pipe railing. A 10-ft. sliding door protected with an iron gate is necessary for the removal of either complete units or parts of the various machines. A crane, portable commutator grinder, telephone, enameled signal signs, fire extinguishers, sand buckets, clock, a desk and a tool cabinet should be included in the equipment.

In case power units making even a slight noise are used, it would be advisable to partition off the hoist with glass and Hy-rib.

The providing of miners with bathing facilities is now more or less general practice and eventually will become compulsory. The requisites are good ventilation, light, heat, ease in cleaning, reasonable privacy to bathers and dressers and reasonable protection to their property when left in the rooms.

The washing should always be done under showers and never in tubs, as diseases, particularly those of the eyes, are easily transmitted. A shower allows of a quick cleansing all over, is refreshing and pleasant, and the waste water is removed as fast as it falls. For each bather there is required 8 to 10 gal. of water, plus 10 more for scrubbing out the room, etc. Not over 10 min. is necessary for a comfortable bath. The faucets and all fittings should be of the strongest, as men often use considerable strength in operating them.

Clothes should be stored and dried by suspension from hooks hanging from the roof. This requires a height of 20 ft., allowing for the clothes clearing the floor by 8 ft.

The form of hook shown in Fig. 13 is a satisfactory one. These are numbered, and one is allotted to each user of the room. The hooks are hung at the end of a stout chain running over a small pulley. The other end of this chain is fastened by a padlock to the back of the bench, as shown in Fig. 13. The chains must be long enough to extend from the padlock and over the pulley to the clothes hook, with a dead length below the padlock to allow of lowering the clothes to the floor. This extra length cannot be allowed to lie on the floor, and a small partitioned trough should be set under the top bench-pipe for its reception.

Hangers should be on 20-in. centers and staggered. Benches should be of the design shown, allowing of turning the hose on the floor. Washbowls should be individual and of heavy construction. The type furnished by the Manufacturing Equipment and Engineering Co., of Boston, is recommended. Every washroom should be further equipped with a bubbling drinking fountain, locked cabinet for the keeper's supplies and garden hose for scrubbing.

The floor should be of waterproofed concrete, with rounded corners where walls and floor meet. The side walls should have three coats of white enamel to a height of 7 ft., allowing of their being scrubbed. Shower partitions may be of painted sheet iron with pipe and pipe-fitting supports.

Warm Water Is Preferred to Hot and Cold

Water with a regulated temperature of 100 deg. should be furnished. This may be heated in a standard type of heater by exhaust or live steam. Two separate pipe lines for hot and cold water complicate the plumbing and are unsatisfactory. Urinals must not be allowed in the main washroom.

The rescue station should be placed between the washroom and the warehouse on account of quiet, nearness to water and the ability of the washhouse attendant to care for it. Men on stretchers can be taken here through the washroom and thence directly outside if an ambulance is called.

The equipment should include: 1 medicine cabinet, 1 first-aid apparatus cabinet, 1 blanket chest, 2 cots, 6 ambulance stretchers, 6 rubber blankets, 6 wool blankets, 6 rockers, 1 flat-top desk and chair, 1 Siebe Gorman vivator, 1 Siebe Gorman Red Cross first-aid cabinet, 1 Siebe Gorman Red Cross pannier, 4 sets 2-hr. Proto apparatus, 4 oxygen tanks, 4 hand electric lamps, 4 axes, 4 suits oil clothes and rubber boots, 1 operating table, 1 instrument stand and sterilizer, hot-water bags, ice packs, enameled buckets, bedpans, etc.

Next to the washroom should be placed the lamproom. This should be equipped with charging racks, battery lamps, storage racks, oil lamps and a zinc-covered general-repair and cleaning bench, with lockers below carrying repairs, tools, etc. Sand buckets, fire extinguishers and record books finish the equipment.

Next to the lamproom comes an office for the use of the overmen, shotfirers and the time clerk. This should be fitted with a flat-top desk, six chairs, a record-book cabinet, telephone to main office and mine and a railed-off entrance for men awaiting orders. A private bath should open direct from this office, avoiding the necessity of the officials having to mingle with the rest of the force. This is an advantage mainly from the standpoint of discipline.

Hiring of men is all done at the main office, where they receive their checks and credentials. This eliminates the necessity of the overman's office opening onto the street and allows of placing it where all inner operations of the plant come under his eye. Where the overman does the hiring, men may be conducted to his office by the washroom attendant.

In the wareroom are kept, in tiers of bins, small tools, electric supplies, nails, spikes, repairs of all sorts, miners' tools, paints, waste, reserve stocks of lamps, magnetos, stationery, etc. The equipment should consist of numbered tiers of sectional steel bins and shelving such as made by the Berger Manufacturing Co. A desk and stool, a pair of scales, tools for opening packing cases, a truck, fire extinguishers, telephone connected with local system, index system for stock and a catalog cabinet complete the furnishings.

Partitioned from the main wareroom are two other rooms. One of these will be the auxiliary storeroom in which are stocked heavy supplies that are usually carried in piles. These will consist of brattice cloth, rope, wire, cement, fireclay, lime, roofing, building paper, heavy repair castings, etc. The other room will be for the storage of oil. It should be equipped with 8 to 10 two-barrel type-B 14-gage Boswer oil tanks, set back to back and fitted with 1-qt. pumps and nameplates. A barrel runway above these tanks allows of depositing a barrel direct from the trolley serving this room, emptying it and taking it out for reshipment.

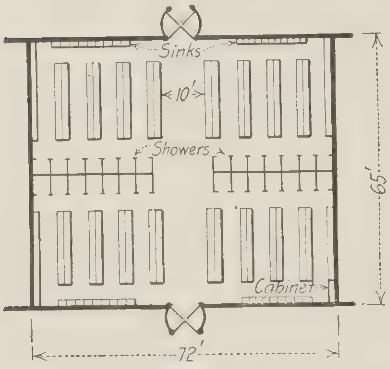

FIG.11

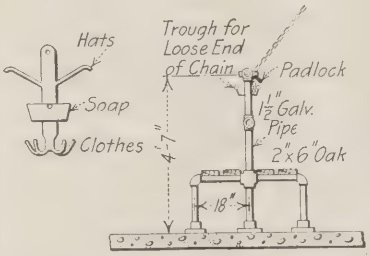

FIG.13

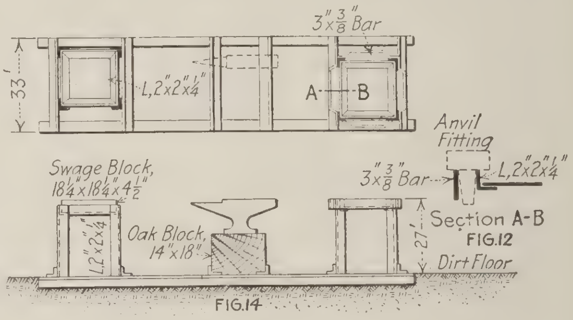

FIG.12

FIG.14

FIGS. 11 to 14. SHOWING ARRANGEMENT OF WASH ROOM AND DETAILS OF WASH-ROOM BENCH AND OF ANVIL, SWAGE BLOCK AND TOOL HOLDER IN BLACKSMITH SHOP

An objection may be raised to the storing of oils in the general building. The storage-battery lamp is becoming universal, and even in the largest operations but few of the oil type of safety lamps will be required. High-volatile oil for these lamps should be stored in an underground tank of 100 gal. or more capacity (with pipe connection leading to the lamproom), fitted with locked pump. This type of oil storage is accepted by insurance companies in the most crowded sections of large cities and is entirely safe.

In the auxiliary storeroom should be placed a small office for the warehouse foreman, with a wicket opening to the shop.

The Essentials of Good Shop Design

The important features of good shop design are light, space, proper equipment properly placed, ability to handle heavy work without manual labor or interference with other operations, and cleanliness. A shop should be lighted on three sides and have a southern exposure. Illumination should be obtained from windows set high enough to throw the light down on the machines and to avoid their being broken from careless handling of long pieces of stock or work. The walls should be painted black for a height of 6 ft. from the floor; above that, including the roof, white.

Electric clusters must be placed over each important machine, the erection floor and the anvil. An extension light should allow of inspection in the pit.

Ample space around each machine for its work, an erection floor large enough to assemble mine cars, machines or locomotives, and a concrete-lined pit (to facilitate locomotive repairs), adjacent to the erection floor, are all essential.

A standard equipment for the shops is here listed:

BLACKSMITH SHOP

1 No. 08-T Buffalo down-draft forge with 48-in. fire pan, water and coal box.

1 No. 3 Buffalo steel pressure blower, belt-driven.

1 300-lb. anvil with fittings.

1 18¼x18¼x4½-in. swage block.

1 steel combination stand, as in Fig. 14.

1 blacksmith's bench with a ⅜-in. round bar set a distance of 2 in. away from its edge, on which to hang tongs.

1 blacksmith's workbench with 50-lb. blacksmith vise and 6-in. pipe vise.

1 No. 5 Buffalo combination armorplate punch and shear without truck.

1 150-lb. Mayer's Little Giant power hammer.

1 30-in. Peerless belt-driven upright drill with power and hand feed, with a set of drills.

1 10-in. base blacksmith's taper mandrel.

1 set of hammers, tongs, bolt clippers, a 200-lb. anvil and a blower for outside work and tuyere irons for outdoor forge.

MACHINE SHOP

1 20- and 36-in. by 14-ft. Rahn Hannon Co. belt-driven gap lathe, with regular equipment of chucks, taper attachment, turret and tools. This takes the place of one large and one small lathe for making bushings, turning commutators, etc.

1 Oster pipe machine with extra dies for ½-in. to 6-in. pipe and 8 sets of bolt dies for ¼-in. to 1⅛-in. bolts.

1 36-in. by 12-ft. Niles-Bement-Pond Co. planer for making switch points and keyseats and for facing valves, etc.

1 portable Sullivan electric drill.

1 No. 2 Marvel hacksaw, belt-driven.

1 36x5-in. Keystone grindstone, belt-driven.

1 Partridge emery grinder with 1 coarse and 1 fine wheel.

1 set of pipe cutters, pipe wrenches, ratchet wrenches, blowtorch, bench and machinists' vises, diestock sets, reamers, taps, micrometer calipers, screw and wire gages, hacksaws, machinists' hammers, tinners' tools, etc.

6 Buda 1-B track jacks.

2 Jim Crow rail benders.

1 roller rail bender.

1 set of numbering stencils, etc.

2 tool cabinets.

1 general bench for electricians and machinists.

1 20-hp. motor, with necessary line shafting, bearings, belts, etc.

1 2½-ton portable Dale crane and hoist.

1 No. 51 Universal crescent wood cutter.

A device for turning over mine cars is also necessary. This can be made up of a shaft with two drums carrying ropes with hooks at their ends and a means for rotating the whole.

How the Equipment Should Be Arranged

The proper location of equipment is as follows: In one corner of the shop and next the entrance should be the blacksmith with his forge at his back, anvil in front with swage on one side and tool rack on the other. Next to the tool stand is placed a small bench on which tongs and hammers are carried. Horseshoeing should be done in a shed outside the shop. This shed should be roofed and have a horseshoe and shoeing-tool cabinet on one side and on the other, or that nearest the central lane, a numbered rack for miners' picks and drills, where they can leave them at the end of the shift and get them the following morning. This avoids their entering the shops. Across from the anvil should be set the drill press, punch and shear and the blacksmith's workbench.

The hacksaw should have a prominent, clear setting, as heavy work is brought to it at all hours. Such work should not interfere with any other work or machine. Next in importance is the pipe threader, work in which should also clear all other machines. The lathe and the planer come next in importance, while the grinding tools may be set back against the wall.

By having a tamped dirt floor under the blacksmith and giving him a down-draft forge, this department can be kept clean. The rest of the shop should be concrete floored and can be kept in good condition with little trouble.

Outside the shop should be a blacksmith-coal bin, an ash bin, a scrap-iron bin and an auxiliary rack for bar iron and pipe, also an outdoor forge and anvil for hot-weather work. It is during the summer that most of the heavy repairs are made, and to ask the blacksmith to stand over an inside forge is offering him a pretty warm job.

No woodworking tools are shown in the accompanying drawings, as it is assumed the entire equipment, including cars, will be of steel, making such machines superfluous.

Construction of Auxiliary Powder House

The auxiliary powder house should be of Hy-rib and steel construction on 8-in. concrete foundation walls, wood-lined and wood-floored. The flooring should be of 2x4-in. tongued-and-grooved milled planking on 4x4-in. sleepers laid in cinders. The woodwork should be nailed with copper nails, and a wood door with brass lock and hinges be provided. Lightning conductors should be placed at each end of the building, which should be 20 ft. long, 16 ft. wide and 8 ft. high.

This building is used for storing empty powder canisters at night and for filling them before the shift goes down. It should be fitted with numbered pigeonholes for the canisters, a wooden bench for filling and a copper hammer and chisel for opening cases. Here are brought by the industrial car each morning sufficient cases of powder from the main magazine to meet the day's requirements. If any cases are left over, they are immediately returned to the main magazine.

About 20 ft. back of the auxiliary powder house should be a small detonator storage shed of concrete, with wooden lining, enabling the warehouse foreman when issuing canisters to give out at the same time the necessary detonators.

A light housing with Hy-rib roof should cover the wet- and dry-sand bins, with a space for the sand drier between them. This allows of shoveling wet sand to the drier and from there the dry sand to its bin. S. B. Stine, Osceola Mills, Penn., makes a typical drier of good design.

Steel Tank Is Preferable to Wooden One

A 30,000-gal. tank will meet all requirements for water supply and should be placed reasonably close to the feed-water heater. A steel tank remains watertight indefinitely; there is no danger of its bursting, even in the coldest weather; and it has a life fully three times that of a wooden one. Such a tank should, however, have a steam pipe run up through the center for cold-weather protection. Below the tank a small shed should be placed for the housing of a reel carrying sufficient length of hose to protect the entire yard. This shed may also contain the electrically driven deep-well pump.

The watercloset must be convenient to all employees, yet off the main lines of travel. The fittings should be of enameled iron; urinals on one side and closets on the other. Shields are better at the entrances than doors, as it is almost impossible to keep the latter shut.

The airshaft should contain a partition so as to allow of handling supplies and men on one side (in the case of a large mine, or as an auxiliary outlet for men in the case of a small one) and air on the other. A platform cage with an end-hoist tower and a single-drum second-motion electric hoist, with rope, sheave, telephone, pneumatic signals and enameled signs form the equipment. A reversible fan of the Sirocco, Jeffrey or Sullivan type, driven by silent chain from a variable-speed motor, housed in the same building with the hoist, is recommended. In these units steel and Hy-rib again may be used to the best advantage.

In cold climates a powerful air heater should be installed on one side of the fan, assuming that when blowing, half the air is heated to a temperature sufficient to bring the whole to a point where the danger of ice forming is eliminated.

The main powder magazine should be built along lines recommended by the mining department in the state in which this building is to be erected. In case there are no particular specifications to be met, the designs recommended by the United States Bureau of Mines may well be adopted.

Arrangements should be made so that part of the bone in the waste bins under the picking tables may, instead of going to cars, be diverted to a roll crusher feeding an elevator, in turn discharging to the boiler-room coal conveyor.

It is almost impossible to ascertain the heat available from refuse until the tipple has been placed in operation, but as no additional expense is required to arrange for the possible future installation of the apparatus described, such arrangements should in every case be made when the tipple is being built.

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An Interesting Pennsylvania Mine

By J. P. Vogel*

SYNOPSIS—A large preparation plant is here described. The capacity is 6,000 tons daily, and the bone coal secured in the picking process furnishes fuel to a large steam-driven central power station.

The Lucerne mines of the Jefferson & Clearfield Coal and Iron Co. are located at Lucerne, Penn., on the Buffalo, Rochester & Pittsburgh R.R., about 5 mi. from Indiana. This plant was built in 1914, and the surface improvements are of the most substantial and permanent character.

At the time this plant was designed, the power requirements for these, as well as for some other then existing mines of the company and still others it contemplated building, were such as to warrant the erection of a large power station. Lucerne was centrally located, and the good water-supply and cheap boiler fuel available from the preparation plant made it an ideal location for the central power station.

The Freeport seam of coal is here mined, being reached through two drifts and one shaft. The great care with which this coal is prepared for the market made an efficient preparation plant imperative; and for economy, both in first costs and operation, the central preparation plant, or tipple, was built to receive the coal from both the drifts and the shaft.

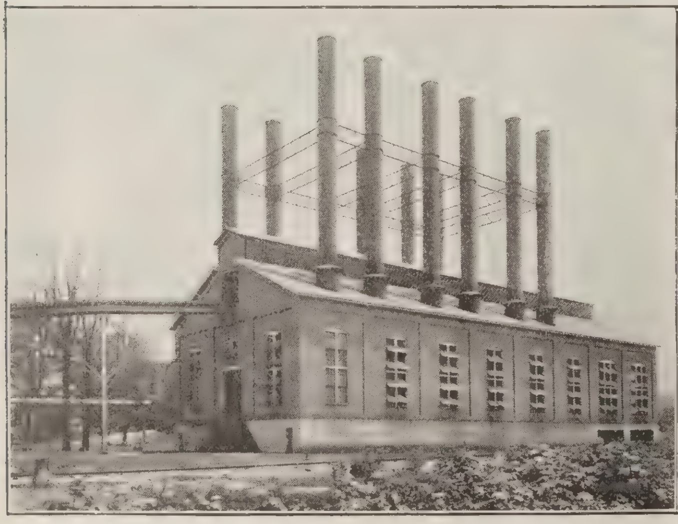

FIG. 1. LUCERNE POWER STATION

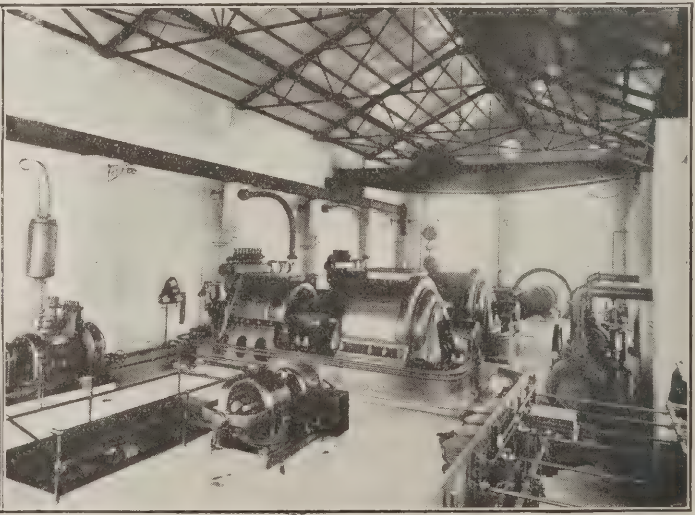

FIG. 2. INTERIOR OF POWER STATION

The accompanying Figs. 1, 2 and 3 show exterior and interior views of the power station, which is of brick and concrete construction. Steam is generated in twelve

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*Pittsburgh, Penn.

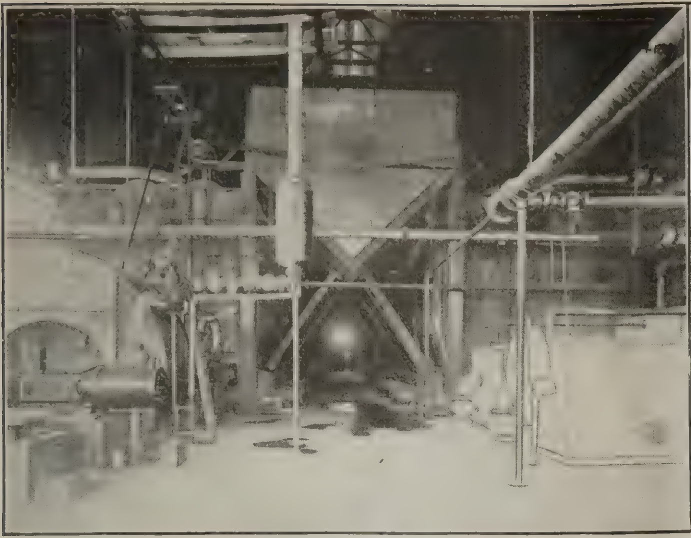

FIG. 3. ANOTHER VIEW IN POWER PLANT

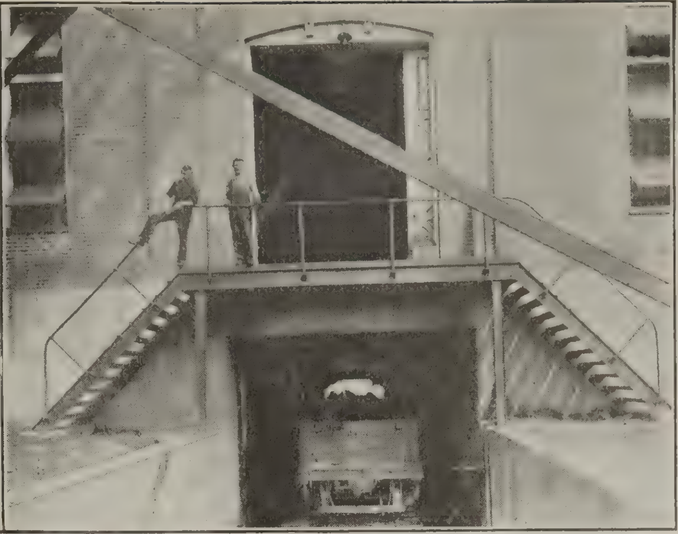

FIG. 4. ASHES ARE DELIVERED TO GONDOLA CARS

500-hp. Stirling boilers—three batteries of two boilers each on either side of the boiler house. These units are equipped with Jones underfeed stokers, fed from an overhead steel-and-concrete bin. It should here be noted that the fuel for this boiler plant consists, when running normally, of practically all bone coal, or refuse that has been separated from the coal in the preparation plant. This not only makes cheap boiler fuel, but greatly reduces the volume of this refuse, and to that extent simplifies the ever-growing serious problem of waste disposal.

The water-supply is taken from a local stream (Yellow Creek) and is heated and slightly treated in Cochrane feed-water heaters which receive exhaust steam from the smaller engines. The ash is delivered directly to gondola cars from the stokers, as shown by Fig. 4.

Fig. 5 shows the headframe over the shaft, which is located several hundred feet from the power house. As will be noted, this headframe is of steel construction. The shaft at this point is a three-compartment one—one compartment is a pipeway and the other two, or hoist compartments, are arranged for using tandem cages which hoist two cars at a time from the mine.

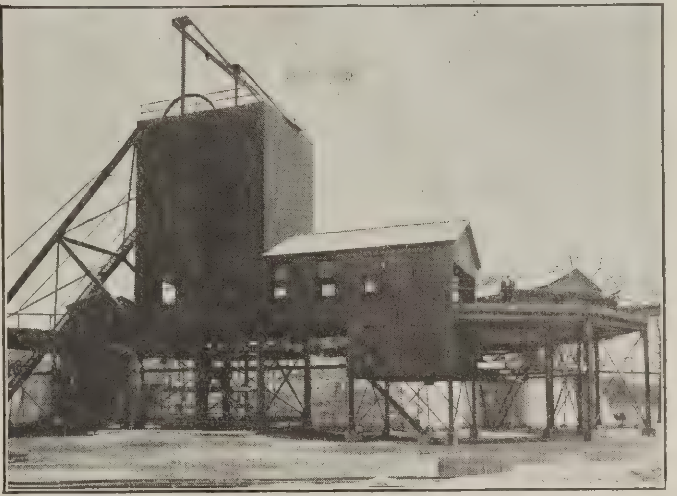

FIG. 5. HEADFRAME OVER SHAFT

Loaded and empty cars are handled to and from the cages, as well as trips of loaded and empty cars by electrically driven car-caging and trip-handling apparatus, which reduces labor at this point to a minimum. From here to the tipple, or preparation plant, is a distance of about 4,000 ft., and loaded and empty cars are handled between these points by electric haulage motors pulling trips composed of 60 cars or thereabout to each trip.

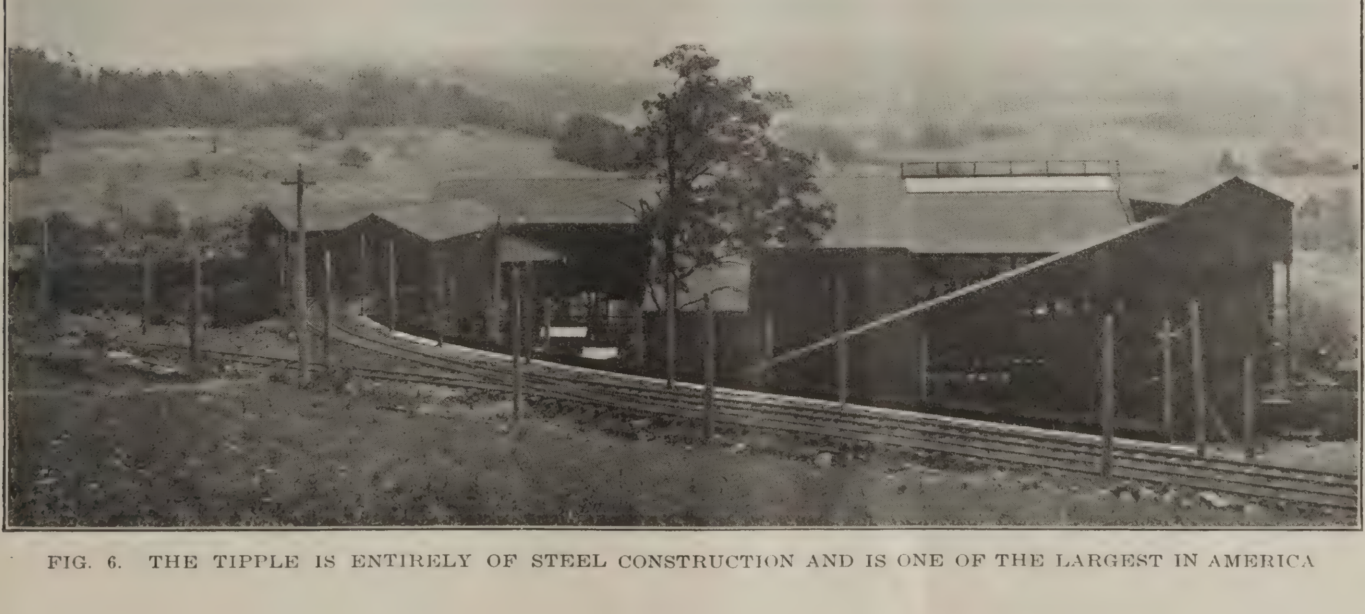

FIG. 6. THE TIPPLE IS ENTIRELY OF STEEL CONSTRUCTION AND IS ONE OF THE LARGEST IN AMERICA

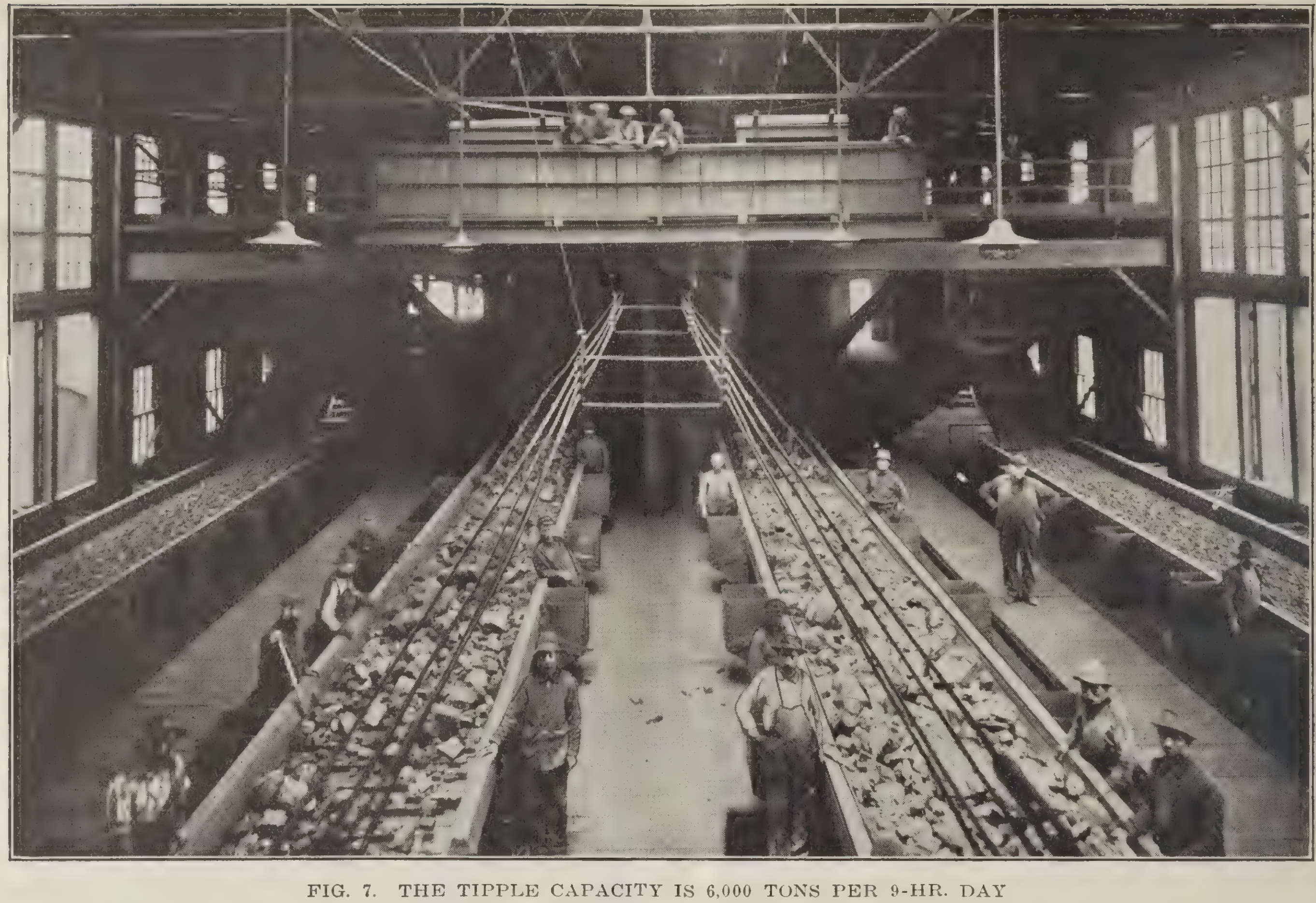

FIG. 7. THE TIPPLE CAPACITY IS 6,000 TONS PER 9-HR. DAY

The tipple at Lucerne, as shown in Figs. 6 and 7, is entirely of steel construction and is one of the largest and the most complete preparation plants installed at a bituminous mine in this country. The capacity is 6,000 tons of coal per 9-hr. day, and the entire tipple is built in two parallel units, each entirely independent of the other.

Loaded pit cars are brought into this tipple from two sides—one from the shaft and the other from the two drifts. Upon the arrival of the loaded trips at these approaches or landings, they are passed through the tipple mechanically. Endless chains with dogs feed the loaded cars into the tipple at a uniform rate, and cars are stopped before reaching the scales by car-feed regulators.

From here loaded cars pass over scales through two crossover dumps to kick-backs which return the empty cars by gravity to trip-makers that make up the trips of cars ready to be coupled and returned to the mine. The operations of the trip-feeders, car regulators and trip-makers are controlled by one man in the operating tower in the tipple.

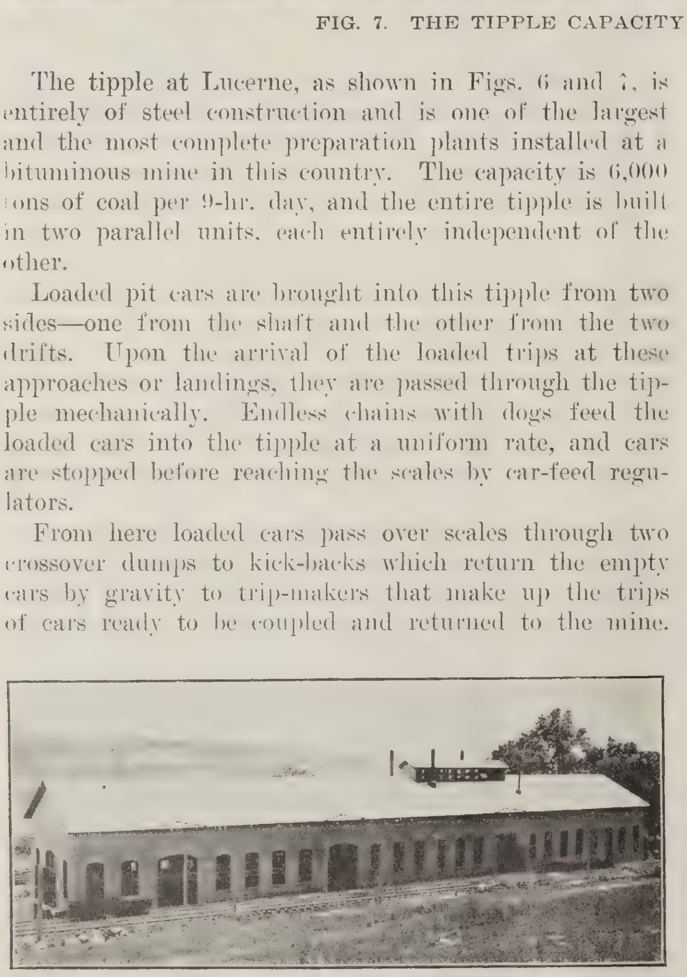

FIG. 8. THE MACHINE, BLACKSMITH AND CARPENTER SHOP

From the dump, coal is passed to a feeder which delivers it uniformly to the shaking screen. This screen makes two grades of coal—lump, and nut and slack. The lump is passed directly to the picking table, while the nut and slack is delivered to a revolving screen which separates it, the nut passing to a nut picking table and the slack to a combination conveyor.

After the lump and nut are picked, they are either loaded separately or mixed to form various grades of coal. The refuse that is picked from the coal is delivered through chutes at the side of the men to a conveyor which delivers it to a refuse picking table. Here the bone, after having the distinct slate picked from it, is delivered to a crusher which reduces it and stores it in a bin at the front of the tipple until it is taken by an electrically driven larry to the boiler house. The entire operation of all apparatus making up the two units is under the control of one man stationed in the front of the picking house.

Fig. 8 shows the shop at Lucerne, which is built of brick. This shop is divided into three parts—that is, machine, blacksmith and carpenter departments—and is well and adequately equipped with modern electrically driven tools.

This plant was designed and built under the direction of L. W. Robinson, president of the Jefferson & Clearfield Coal and Iron Co., at Punxsutawney, Penn., by Heyl & Patterson, Inc., contracting engineers, of Pittsburgh, Penn.

Mine Inspectors' Institute of the United States of America[*]

SYNOPSIS—Aims and purposes of the Institute and the benefits to be derived from association in the work of mine inspection. Results accomplished by the inspectors shown by the improvement in mining conditions and the reduction in number of accidents. Depression in mining to be succeeded by great prosperity. Future of the Institute.

Fellow Members of the Mine Inspectors' Institute of the United States of America:

This is the eighth annual conference of this Institute. It affords me great pleasure to have the honor of bidding you welcome to this meeting and especially to the City of St. Louis. I feel very grateful to George Hill, the Chief Inspector of Mines, and his able associates, in Missouri, for the splendid assistance they have rendered to make your visit here pleasant and I hope all may find it profitable.

Aims and Purposes of Institute

Owing to some changes in the membership of the Institute each year, it may not be amiss to state at this time some of the reasons why there should be an organization of mine inspectors maintained and meetings of this kind held yearly. The work of mine inspectors is the same everywhere and it makes no difference as to the length of time one has been in the service. His chief problem is: How can I as an inspector bring about a better protection of the lives and health of the men employed in and about the mines? By reason of such an organization as this much can be done that cannot be accomplished by the individual.

Our national and state governments are managed by organization. In fact, to accomplish any good results, whether political or otherwise, it must be done by having effective organization. Therefore, the reason is all the greater why we as mine inspectors should organize, having in view the adoption of such remedial legislation in our various states as shall bring about the best results. The public expect that mine inspectors, who have opportunity to acquire a more intimate knowledge of the various mining conditions, shall take the initiative in the promulgating of measures that will be the means of reducing the hazards in connection with the mining industry, so that it will be as safe to follow mining as any other line of industry.

Benefits and Need of Association

These meetings afford an excellent opportunity to bring about a closer relationship, or rather comradeship, than can be gained in any other manner. The discussion of the numerous problems that arise in one's daily vocation gives us all inspiration and renewed energy, so that we go back to our respective fields of labor with renewed zeal and a determination to give our best service for the good of those employed in and around the mines in our charge. The mine inspector may be less conspicuous than other forces, in the service he renders for the good of mine employees; but his daily contact with the workmen gives him an influence that, if properly and intelligently directed, will be the means of bringing about better results for their welfare than all other agencies.

This statement is not made with the intention of minimizing the work that is being done by other organizations. I firmly believe that any organization that is engaged in the work of raising the standard of efficiency among mine workers should have the hearty endorsement of this Institute. It is true that we have connected with the mining industry a great many men of foreign birth who do not understand the English language, neither our methods nor our form of government. Therefore, any effort that is being made to develop skilled workmen where they are unskilled, and to instruct the unintelligent, is a laudable work and will reward one with the knowledge that his efforts have been the means of reducing the hazards and accidents in the mines.

Development and Improvements

Mine inspectors who have been identified with the service during the last twenty years have reason to note the wonderful development and the many improvements made in the mining industry. With the larger number of men employed, the responsibilities and dangers attendant on mining have increased proportionately. Since our last meeting one year ago there have occurred three disastrous explosions in which over 400 lives were lost; namely, Hillcrest, Alberta, Canada (June 19); Royalton, Ill. (Oct. 27); and Layland, W. Va. (Mar. 2). None regret these dreaded catastrophes more than the members of this Institute. Knowing full well all the hazards and dangers connected with the rescue work, especially where there are many lives at stake, the sympathy of our members always extends to those inspectors in whose districts these disasters occur.

It is to be regretted that when accidents of this kind occur the newspapers often give incorrect reports, some of these being very ridiculous and of such a nature as to engender feeling between the officials of the different departments engaged in the work of rescue. The great work that devolves on all officials in their efforts to make mines as secure as possible against accident is one of the gravest of responsibilities and necessitates eternal vigilance. In time of accident or disaster, those whose duty it is to render all possible aid should bring all their experience and knowledge into immediate service. Friction should and must be avoided and diversity of interest obliterated where all are engaged in the noble work of saving those who are suddenly menaced in their hazardous calling.

The occupation of the miner is considered hazardous at the best, but many lives are often lost that could have been saved. The accidents that occur daily in mines are not due as much to the lack of legislation as to the lack of obedience and the closer observance of mine laws and regulations. Much work waits to be done by this Institute, and I believe that no men are better prepared than are the mine inspectors of this country to bring about better conditions and to advocate legislation that will better safeguard life and reduce the death rate and accidents in mines to a minimum.

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[*] President's address delivered at the eighth annual meeting of the Institute, held in St. Louis, Mo., June 8-11, 1915.

Reduction in Number of Accidents

It is gratifying to know that there has been a reduction in the number of fatal accidents in the coal mines of the United States during the year 1914, and with the exception of 1912 the death rate, per thousand men employed, is lower than for any year since 1903. In the year 1914 the number of fatalities in and about the mines was 2,451, which is 3.30 deaths to every 1,000 persons employed, or 4.80 to every 1,000,000 tons of coal produced, or one person killed for each 208,333 tons. This is the largest production of coal per fatal accident in this country, with the exception of that for 1912. There is no doubt but that the gradual decrease shown in the last few years must be attributed to the work of the many organizations having in view the prevention of accidents; and this applies not only to mines but to all other industries as well. But that we may have a reduction of accidents to a minimum requires that the work so well begun be carried forward, bearing in mind that eternal vigilance on the part of all connected with mining is necessary.

In looking over the statistics giving the causes of mine accidents it would seem that, with all our efforts, we have not been able to reduce the number of those due to falls of roof, coal and rock. The percentage of these accidents remains practically the same in all the states. Taking the United States as a whole, the proportion was 46 per cent., while in the state of Illinois, for the year ending June 30, 1914, it was 52 per cent.

I desire to draw your attention to what I consider the most dangerous work connected with the operation of mines, as shown by the number of fatalities due to pit cars and locomotives. In the United States the number of fatalities from this cause is 15 per cent., while in the State of Illinois, for the year ending June 30, 1914, it was 25 per cent. When we consider the number of employees engaged in this work, which varies from 6 to 8 per cent., these statistics show about one person killed for every 150 employed in that work.

Miners Constantly Take Chances

I mention these matters for your consideration and ask you to suggest what this Institute should do in regard to reducing the accidents from these two sources. I think I am not overstepping the truth when I say that one-half of the accidents could be prevented if mine employees would live up to the legal requirements and carry out conscientiously the various rules and regulations governing their work, instead of taking chances by ignoring them. In this connection I may be pardoned for quoting a verse written by Berton Braley and published in *Coal Age* (Vol. 3, p. 711), entitled "The Gamblers." It runs as follows:

"We'll take a chance—we're not afraid of dangers,
There's nothing killed us *yet,* so we're all right,
To every sort of worry we are strangers,
And so you see us, always gay and bright;
Maybe some day the roof will fall and get us,
The dynamite may go off in advance,
The gas explode, but we won't let it fret us,
We'll take a chance!"

I may mention, though with much regret, that the industry with which we are identified is passing through an era of depression such as it has not known for many years. In the State of Illinois alone, in which there are 80,000 mine employees, it is safe to say that not more than one-half have employment at the present time. The same condition prevails in many of the other coal-producing states, which means many hardships to the wives and children who are dependent on these men. However, when we think of the carnage of human life that is occurring among the European nations and that we, as a people, are at peace with all nations, we have great reason to be thankful. There is no doubt in my mind but that the present depression is a reflex of conditions that now prevail owing to the strife among European nations. I am sure it is the desire of all our people that there may be a speedy cessation of hostilities among the warring nations. I believe when that takes place this country will reap a greater measure of prosperity than it has ever known in its history. It is true that few nations, if any, excel this country in natural wealth and resources, and an abundance can be produced to supply the needs of all within its borders, and much to spare to the countries that are less fortunate.

Future of the Institute

I wish to draw your attention to the fact that if this Institute is not accomplishing the results intended by having an association of this kind, the fault is entirely our own. I believe there is one object in particular that is preventing and proving a hindrance to its success as an Institute. I refer now to our failure to use it as a medium to reach the people and the governmental powers. Therefore I recommend that some steps be taken at this meeting that will require that a change be made in the constitution and bylaws of the Institute so that the subjects discussed and which appear to be of sufficient interest to the mining industry be given immediate publicity through the periodicals that publish matters relating to mining.

I want to suggest here that there will be less delay in the publication of our proceedings if all papers are sent direct to the editor in chief, who is their custodian, as provided by the constitution, and whose duty is to pass on all papers to be read and to prepare them for publication within 60 days after the adjournment of each annual meeting.

I know of no organization of men whose aims and ideals are more lofty than the men who make up the membership of this Institute. You have been selected by your states as men in whom they have the fullest confidence, believing that you will devote your time to the work of your office and require that every precaution be taken necessary to insure the health and safety of the men employed in the mines. There is no more laudable work than that in which you are engaged, and that is the preservation of human life.

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The Life of Mine Timbers can be greatly lengthened by making a careful study of the character of the roof they support. With a strong roof and bottom, the timbering should be so set as to allow the roof to settle easily and gradually, or the floor to heave, thus preventing the waste of timber due to breakage which is sure to occur if the roof falls abruptly. With a strong roof and floor, loosely driven timbering and soft wood caps will prevent the bending and breaking of the timber. Tapered props, the small end of which is about one-fourth the size of the body of the prop, give good results and last longer than ordinary timbering.

A New Era for Mining Towns

By Karl B. Lohmann*

SYNOPSIS—The attitude of mine owners toward the planning and development of coal communities has radically changed for the better. The results of the application of scientific treatment to mining towns are greater self-respect and increased efficiency on the part of the employees.

Science and tradition both tell us that a pig was once an object of filth. He was fed upon waste. He breathed, slept and wallowed in grime. Otherwise, it seemed, he could not be happy—he could not live.

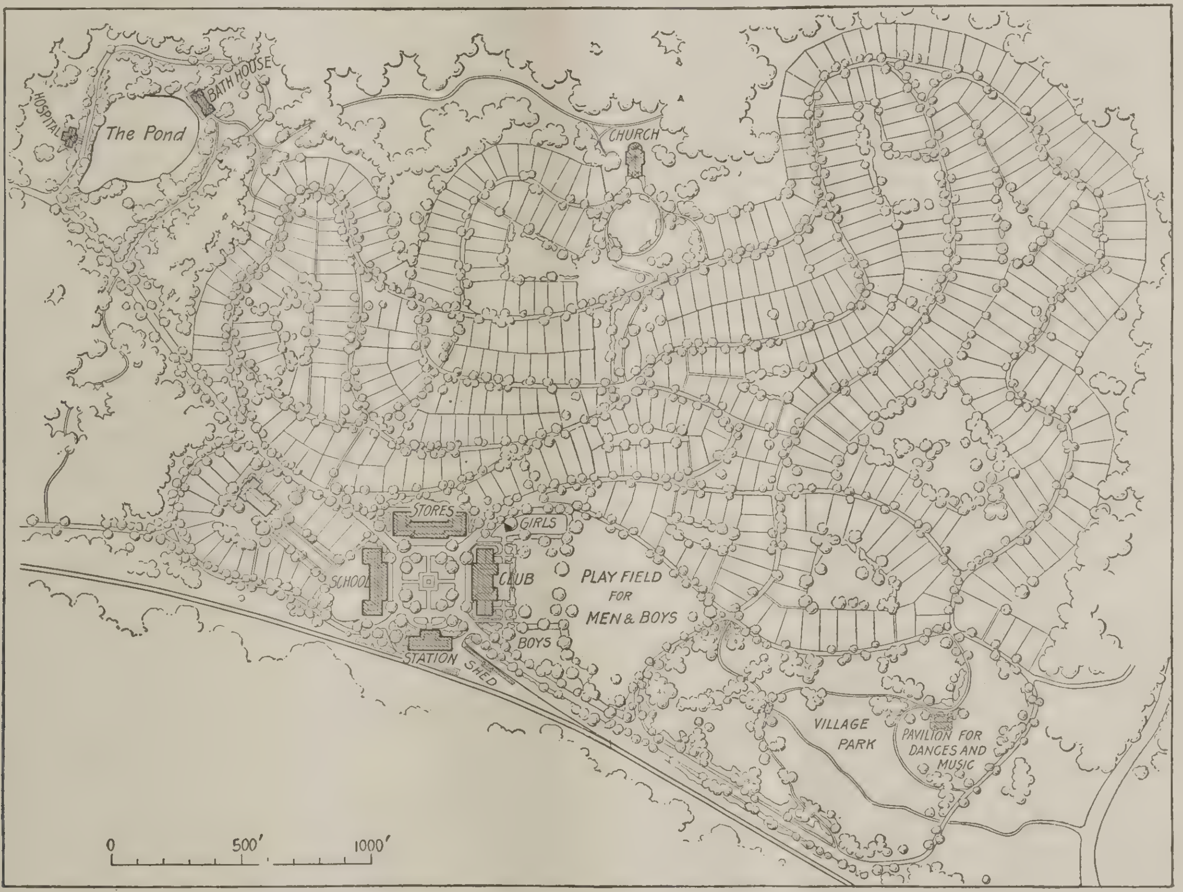
Time has changed his status, however. No longer do we find such prevailing filth in the pig's domain. We see him afforded good food and good air, and we find him disporting himself quite merrily amid new surroundings. Indeed, his environment has been very much transformed. Yet it appears that not only can he live under the new conditions, but that he can live far better and live far more profitably to mankind.

In somewhat the same manner we have long been complacent at the sight of ill-planned mining villages, with their squalid shacks, inconveniently disposed streets, and desolate homes with unattractive surroundings. Recreation grounds were unknown, and the entire camp was symbolic of chaos and filth. We have for a long time imagined that in any other surroundings the workers and their families could not be happy. If we should give them bathtubs, they would use them for coal. If we should give them good streets, they would use them for ashes.

General Opinion Has Changed

Time, however, has also changed our attitude in this respect. We now behold a better day in the dawning for mining towns. We realize it in the prize awards by coal companies for better yards and gardens and the tender care of them; we see it in the frequently recurring better streets, and now and then, though rarely, in an entire mining community developed along advanced lines.

And well may it be, this awakening; for multitudes of workers and their families are yet to be huddled together or pleasantly and conveniently provided for in communities still unborn. Mining towns are being built, and hundreds of others are in a process of improvement or of necessary extension and enlargement. Therefore the appropriate day for planning is not of the past, but rather eminently is of the present.



A SCIENTIFIC AND ARTISTIC PLAN FOR A MINING TOWN

This impulse of a new dawn is fraught, however, with as much bad as good, unless it is properly guided. For instance, awakening civic consciousness, in its enthusiasm for improved cities, often is accompanied by and allows of too many unscientific and inartistic results. It is not because insufficient money is expended. It results probably from everybody thinking that he knows how to handle any given situation, together with an indifference to the advice of experts that is far too common. Similarly, in the planning of mining towns there is offered an immense scope for the poor taste of untrained individualism. Mine operators think that their engineering departments are just as perfectly capable of designing parks, gardens, villages and towns as they are of deciding upon the intricate problems of breakers and their accessories, as if town-planning were not a science in itself.

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*Landscape architect, Wilkes-Barre, Penn.

Be that as it may, whosoever is commissioned to design a mining-community extension or a brand-new development can never hope to accomplish it successfully, be he engineer or landscape architect, lest he consider it in a new, far-reaching light. His impulse must be guided by planning that is comprehensive, and this cannot be emphasized too strongly.

Comprehensive planning means primarily taking everything into consideration. It means leaving no stone unturned, whether it be engineering, architecture or landscape architecture. It calls for inclusive, encompassing planning. It presupposes a broad perspective over the entire community, a breadth of inter-relationships, a recognition of advance provision for things comprehensively needed, with due consideration of the bearing of one thing upon other things—that the parts are members of the whole. In short, it compels a full understanding of the entire problem.

Great Results Will Be Obtained

If the awakening impulse for better planning is properly guided, it may be expected to accomplish immeasurable achievement. For the present population who are now to enjoy its fruits, it will bring about added commodity and service. For instance, the men's work will be readily accessible. Their homes, in turn, will be accessible to each other. The community at large may possess in general the greatest number of conveniences available at the time of reasonable planning, such as water-supply, drainage, light, good soil, proximity to a through line of travel. There would be secured to the population ample health in provision for plenty of air, parks, playgrounds, trees along the streets and all preconsidered means of keeping the town clean.

Also, the dawn may illumine the way for better and more commodious environment that will help to conserve the moral and physical forces of the workers. There will be added pride in towns, in homes and in work. There will be an increasing solidarity of feeling in spirit with the companies. So that the crowning glory of any comprehensive planning efforts, from the company standpoint at least, will be an added contentment and efficiency among its workers.

This much may be expected for the present population, for those who live in the communities now. Yet our efforts will not be unmindful of the future. Such comprehensive planning, such broad-outlook-into-the-future sort of planning, will result in more intelligent and adequate expansion of the community. New homes that will have to be built may become part of this same community and be co-sharer in its sometime advantages and developments. Any necessary extended streets will not have to cross a ravine or mountain. And every commodity and means for added efficiency in turn will be applied to the enlarged area of a later time, whether 5, 10 or 15 years hence.

Such planning therefore signals the approach of a new era for mining towns. They need no longer be pictures of desolation and squalor. Every yard, every street, every community is being touched with a new impulse—an impulse which by inspiring environment destroys the morbid cause for much industrial unrest, which Americanizes and draws men into closer harmony with the employer and, most important of all, which brings the workers themselves ultimately to an added sense of their part in the great scheme of things.

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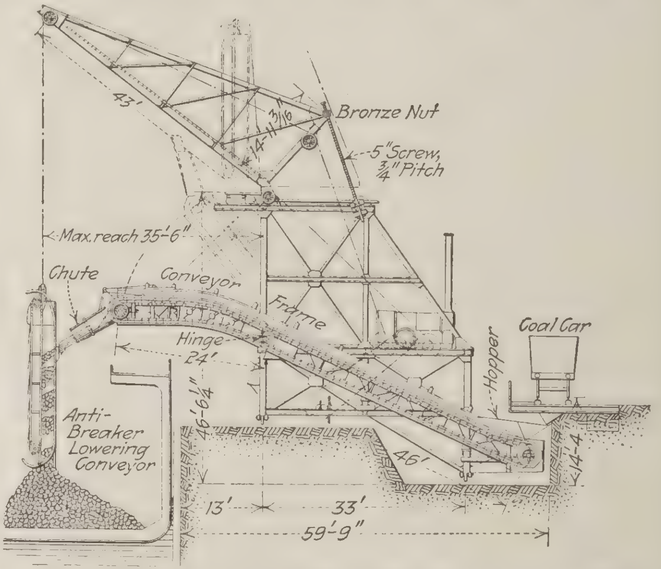
English Ship-Coaling Machine

A coal-shipping plant installed at Workington, England, is designed specially to handle the coal with a minimum of breakage. The machine is carried by a tower traveling on a track 120 ft. long near the edge of the dock, the rails having a gage of 33 ft. In the rear of this track, and above it, is a track for the drop-bottom coal cars, the coal being discharged between the rails and delivered to a hopper on the end of a conveyor frame, which extends through the tower.

The conveyor consists of a traveling belt of steel plates 4 ft. wide, running at about 120 ft. per min. The outer end of the conveyor frame is adjustable, having trunnion bearings in the front of the tower, so that it can be raised or lowered to clear deck fixtures and to give the coal as little drop as possible. The conveyor and the propelling machinery are driven from a 40-hp. engine.



MACHINE FOR COALING SHIPS, WORKINGTON HARBOR

A chute on the end of the conveyor frame delivers the coal to a Handcock antibreaker. This is a vertical tube suspended from a boom on the tower, and containing a series of trays attached to endless chains. The weight of the coal as it flows into the tube operates this vertical lowering conveyor. The loaded trays descend, free the coal at the bottom, and then ascend empty. An automatic brake controls the speed.

In coaling a ship, the tube is lowered till its open end is nearly on the floor of the hull, and as the coal is delivered the tube is gradually raised, keeping its end level with the top of the coal pile, so that the coal flows out without a direct drop. This machine (described in *The Engineer*, of London, July 2) is designed to deliver 400 tons of coal per hour, but can work at the rate of 600 tons per hour. It was built by F. Turnbull & Co., of Newcastle-on-Tyne, to the designs of Cecil Walton, engineer for the Workington Harbor Board, and under the direction of Bowen Cooke, chief engineer of the London & Northwestern Ry.—*Engineering News.*

Loose Mining Methods

By Illinois Engineer

The folly of loose mining methods is sometimes forcibly impressed on the mind of the operator in the form of dollars and cents. Such was the case recently when a surface settlement, caused by the removal of too large a percentage of the underlying coal, damaged property to the extent of at least $7,000.

Had the rooms in the affected area been turned on the proper centers and driven on line, as is the practice in most mines in the same field, the trouble would probably have been avoided. As it was, no room sights were used; the result was that pillars of various sizes were formed. Where the thickness of the pillar permitted, additional rooms were turned off the crosscuts.

The profit obtained from the sale of the additional coal mined from the affected area by this haphazard method was approximately $2,000. This does not compare favorably with the $7,000 or more which will be paid out in damages. The handling of the additional inflow of water is another item of cost to be considered. Eight acres of an overlying seam 4½ ft. thick was damaged to such an extent as to be unminable. In addition to this, more coal will probably be lost in mining around the squeeze than was originally obtained by splitting the pillars.

The foregoing is a conservative estimate of the cost, but proves conclusively, at least in this instance, that loose mining methods do not pay. Risking expensive damage suits for the profit obtained from a comparatively few tons of coal is, in my opinion, short-sighted policy.

Shipments to Upper Lake Docks

Receipts of coal at Milwaukee will have to be abnormally large during the remainder of the navigation season if the record of 1914 is to be maintained. Owing to the fact that the grain and iron-ore trades are practically absorbing all of the larger class of vessels and that higher freight rates will have to be paid as the close of season approaches, this is hardly possible. As a result the coal handlers will face the uncertain requirements of the coming winter with very moderate stocks. Should there be any hitch between the miners and operators next spring and the early movement by lake be delayed in consequence, the lack of supplies will be seriously felt.

Up to Oct. 1 of this year the receipts of anthracite coal aggregated 731,759 tons, or 14,875 tons more than was received during the same period in 1914. In order to equal last year's receipts of anthracite, arrivals during October, November and December will have to aggregate 318,402 tons.

The soft-coal shortage during this same period sums up 424,224 tons, the receipts aggregating 2,197,337 tons, as against 3,197,337 tons in 1914. Stocks will have to be augmented to the extent of 1,297,239 tons during October, November and December to bring the soft-coal shipments up to the level of 1914.

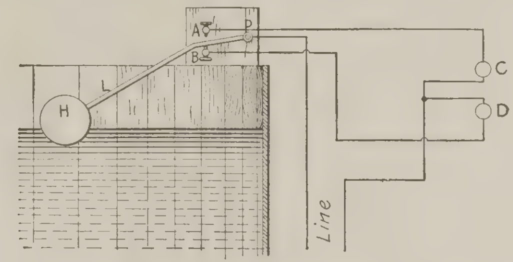
Every effort will be made on the part of coal companies to increase the supply, and the prospect is that the winter-storage fleet will be much larger than usual. Dealers report that coal is moving out more satisfactorily and that business in general has a promising aspect.

Signal for Water-Supply Tank

By C. J. Fuetter

Now that cold weather is soon to be with us again every power-house engineer who has to look after a water tank placed on a hill to supply water to the town knows how unpleasant it is to go out of a warm engine-room to find out how much water he has in the tank. Many such engineers let the pump run most of the time at full speed, in which case it generally happens that the tank overflows.

This is a waste of power, for at a small cost a signal system may be installed that would take care of the water-supply. Such a system is shown in the accompanying sketch. It is designed to work on either a 110- or 220-volt circuit; however, should only 550 volts be available, two 250-volt lamps in series at *C* and two at *D* would be all the changes necessary. *H* is a hollow ball made of copper. It may also be made of cork.



SIGNAL FOR WATER-SUPPLY TANK

This ball is fastened at the end of level *L*, which is pivoted at *P*, its rise or fall completing the circuit of *C* and *D*. If rising, *L* makes contact with the adjustable screw *A* and will light lamp *C*; if falling, it makes contact with *B* and lights the lamp *B*. The last mentioned lamp should preferably be red. A means must be provided so that any undue rise will not bend the lever. This may be accomplished by using contact springs instead of contact screws. It might be well to solder a small piece of silver at the contact points *A* and *B*. Lights *C* and *D* should be so placed in the engine-room that the engineer's attention will be readily drawn to them.

Should no current be available, the signal could be arranged to work with bells, by placing 4 or 5 dry-cells across the lines, with a small bell at *C* and another at *D*. Of course the ring of these bells should have different sounds so that the engineer will know whether the water is high or low, thus indicating to him whether he should slow down or speed up the pump.

New Coal Fields in Manchuria

New coal fields are reported to have been discovered near Station Manchuli by the local chief of police, says *Commerce Reports*. The fields are located about 5 mi. from the Station Manchuli and 2 mi. from the railway line. The discoverer has offered to sell his right in the deposits to the Chinese Eastern Ry., which is investigating the amount and quality of the coal.

Pennsylvania State Tax Upon Anthracite Invalid

SYNOPSIS—The Supreme Court of Pennsylvania has reversed the decision of the lower court and has declared the imposition of a state tax upon anthracite as unconstitutional under the conditions specified. The decision will cause much confusion in making refunds. The State Legislature has already taken action toward the enactment of a law that will meet with the approval of the Supreme Court.

The Pennsylvania State Supreme Court has declared the legislative enactment of 1913 levying a tax of 2½ per cent. per gross ton on the value of anthracite coal at the mines to be unconstitutional. The case reached the Supreme Court on an appeal by the Alden Coal Co. against the decision of the Court of Common Pleas of Dauphin County, which declared the act constitutional and rendered judgment in favor of the state against the coal company for $7,792.86, being the amount of taxes assessed against the Alden company for coal mined and prepared for market from June 28, 1913, the time the law became effective, and ending Dec. 31, 1913. In the decision of the Supreme Court, which was written by Justice Stewart, the contention of the appellants is upheld in the following words:

Text of the Decision

"When the necessary effect of the legislation is to create inequality of burden as we here see it, are those complaining of the injustice to receive no other answer than that, while the Constitution promises them equality in the matter of taxation, because it failed to place restriction upon the Legislature's right to distribute the tax it collects therefore the purpose of the legislation is not to be inquired into? If constitutional requirements are to be circumvented by such simple and easy process of reasoning, the question may yet be asked derisively of the Constitution, 'What is all this worth?'"

While the case against the Alden Coal Co. only involved the collection of less than $8,000, it was purely a test case involving almost $10,000,000, which represented the tax on coal under the act of 1913 up to July 1, 1915, when a new act passed by the Legislature the past summer became effective.

The suit was brought to test the constitutionality of the act and resulted in Judge Kunkel of the Common Pleas Court of Dauphin County declaring in favor of the act. It was the appeal against this decision that has just now resulted in the reversal of the opinion of the lower court.

Basis of the Defence

The attorneys for the coal interests declared from the very inception of the law that it was special legislation. They based their contention on the fact that while anthracite coal was mined in only nine counties of the state, a proportion of the whole tax was to be distributed in such a way to those nine counties that the cities, boroughs and townships in those counties would share in the distribution, even though no coal was produced in a number of the cities, boroughs and townships. This contention has now been upheld by the Supreme Court, from which there is no appeal to any other court, not even to the United States Supreme Court, which usually at some time or other gets the coal cases. This is for the reason that the present case was brought to test the validity of a state law involving a purely state transaction.

It is well to note at this time that the State Legislature of Pennsylvania passed a new anthracite tax law at its session of 1915, and the present court decision only covers the levying of the tax under the old act of 1913, the new law becoming effective with July 1 of the present year. While this present decision cannot directly affect the act of 1915, it is practically certain that it will now get its day in court. The chances are that it will follow in the way of its predecessor, as the only difference between the two was in the matter of readjusting the proportion to be received by the state and the coal-producing counties.

It is also interesting to note that at no time during the progress of the present suit was the right of the state to levy such a tax on coal of any kind questioned. The suit was practically fought on technical grounds as relating to its accordance with the Constitution.

It hardly need be mentioned that if the act of 1915 is also declared unlawful the next legislature will take steps for the enactment of a law that will comply exactly with the ruling of the Supreme Court. So it can be seen that the coal man's respite may not be a very long one.

Refunds to the Dealers

Probably the most interesting phase of the decision will develop when the retail dealers and large consumers begin to ask the producing companies for a refund of the increased price or tax which they have had to pay for coal from June 28, 1913, until July 1, 1915.

At the time the law was announced as becoming effective some of the operating companies, such as the Philadelphia & Reading Coal and Iron Co. simply issued a price circular showing the prices at the mines and then added a note to the effect that prices would be subject to the Pennsylvania state tax of 2½ per cent. on the mine price. Other companies, however, such as the Lehigh Valley Coal Sales Co. and the Lehigh Coal and Navigation Co., simply calculated the tax into their circular prices. In this latter case these companies would have been actually paying tax on their tax, for the reason that the circular prices were the prices for the coal at the mines and it was on the mines price that the tax was to have been collected.

Those dealers who bought their coal from the companies that added the tax as a separate item will at least have no difficulty in making up and presenting their claims, as on all the bills rendered by the companies adopting the first-named plan the tax was always shown as a separate item.

But the still greater question arises, Will the companies all refund to the retail dealers? And if some should be inclined to the contrary, is there any way to compel them, especially those companies that sold at a lump price with no specific mention being made of the tax as a separate item? The retail men certainly expect a refund. Of course there are any number of instances, especially among the larger dealers with whom agreements have been made as to an adjustment, but these cases are by no means common.

Consumers Take Action for a Refund

The actual consumer of the coal constitutes still another angle to the problem. In Philadelphia, for instance, purchasers of coal from the retail dealers have been paying an advance of 25c. a ton on their coal, which the dealers generally explained was designed to cover the tax and also increased operating expenses. The decision of the court was not a day old before the consumers in this district began to figure on just what amount of money was due them from their dealers, and they at once began clamoring for the refund. The first actual step in this direction was instituted by a coterie of the large consumers in the fashionable Main Line residential section, who have consulted attorneys and are going to make a concerted demand on the dealers for a refund.

Extracts from a Superintendent's Diary

James Lang, an old Scotchman whom I have not seen for about 10 years, drifted into camp today in search of work. Had he known that I was superintendent he would have felt sure of obtaining work because he knew that I must have a warm place in my heart for him (one cannot forget the old fellows who take the trouble to initiate one into the mysteries of practical mining, and the old fellows realize that full well, no matter what kind of old fellows they may be), but he did not know that I was the superintendent—in fact, could not have known that I was superintendent at any camp. When we parted company, I was a mining engineer one year out of college and he was a miner in disgrace because of a clash with a superintendent.

He has apparently never recovered from that stroke of bad luck, while I attribute most of the success that I have had since then to the train of thoughts started by his discharge. I had learned to know him so well, the hard-headed old Scotchman who loved poetry, that I felt that any mining camp could use him to its advantage, and that made me feel that our superintendent was at fault in not knowing how to handle him. My interest was aroused to a point where I could not get the subject off my mind until I decided to my own satisfaction just how the superintendent had blundered.

My friend James was a great admirer of Longfellow, and one line of the poet was on his lips at least once every day—it was the line from the "Psalm of Life" that admonishes men to be not like dumb driven cattle. His interpretation of that line caused the final break with his boss.

Our superintendent could not understand why miners had occasion to gather continually and discuss things of common interest, and he was forever trying to discourage such meetings and made no secret about his opposition to them. At first the meetings had been rather informal and really did not mean much to the men, but when the men began to realize the attitude of the boss toward their gatherings, they began to make them count for something. James Lang was a pretty fair talker to say the least, and spurred on by the idea that he was being classed as a dumb beast, he made his oratorical powers felt. The superintendent could not distinguish between a philosopher and an agitator, and the philosopher soon became a full-fledged agitator, and as a result was asked to leave.

About the same time one of the neighboring camps had a strike, called because the superintendent was opposed to the miners having a checkweighman, and the strike was continued until the superintendent backed down. After that the miners at that camp lost interest in the checkweighman issue and before long could not get a majority of the men out when it came time to elect a new one.

These things happened a number of years ago; but in judging of recent events that have occurred all around our camp, it would appear that human nature has not changed very much since then after all, and men are just as anxious now to do things just because some one wills differently as they were then.

I find that James Lang is still repeating the "Psalm of Life" on the slightest provocation, but he has still not learned its true meaning; and try as I might I was not able to recall those old days to his mind in a manner to gladden his spirits. I have not lost hope, however, and if the wanderlust does not again get control of him too soon, I feel that I will have a chance to repay in part the debt I owe him.

Revision of Mining Laws

A convention that will act on recommendations regarding a general revision of the Federal mining laws will meet in Washington, D. C., Dec. 16. Some of the resolutions that will come before the convention will recommend the fixing of a reasonable term of years beyond which placer claims shall be immune from attack on the ground of fraud, full privilege of appeal in all cases of contests over locations, recording of notices of mining locations so as to insure public notice, the abolishment of the law of apex and the appointment of a Government commission under an act of Congress to investigate and to make recommendations as a basis for the revision of the mining law.

All the known mining societies in the United States have been asked to send delegates, and it is the intention that the mining industry will be so well represented that the action of the convention will be regarded as expressing the wishes of the industry.

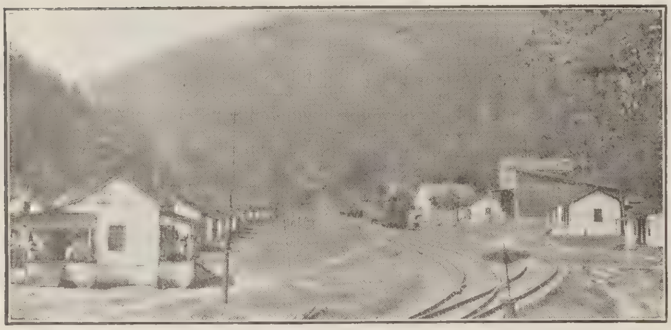
COMING MEETINGS

Illinois Mining Institute will hold its annual meeting on Nov. 20, 1915, at Springfield, Ill. Election of officers will be held and the day will end with a banquet.

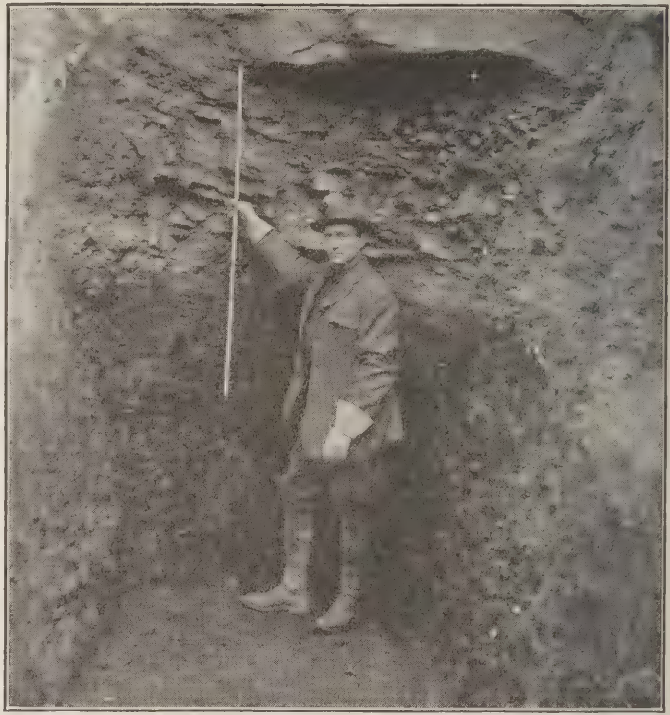
The winter meeting of the Kentucky Mining Institute will be held this year at Lexington, Ky., on Friday and Saturday, Dec. 3 and 4, 1915. The program is not yet completed. The following committees have been announced. Committee on papers: J. E. Butler, Stearns, Ky., and Ivan P. Tashof, Lexington, Ky. Committee on entertainment: Professor C. J. Norwood, Edwin L. Quarles, R. D. Quickel, Milton Sanchez and Ivan P. Tashof.

Snap Shots in Coal Mining

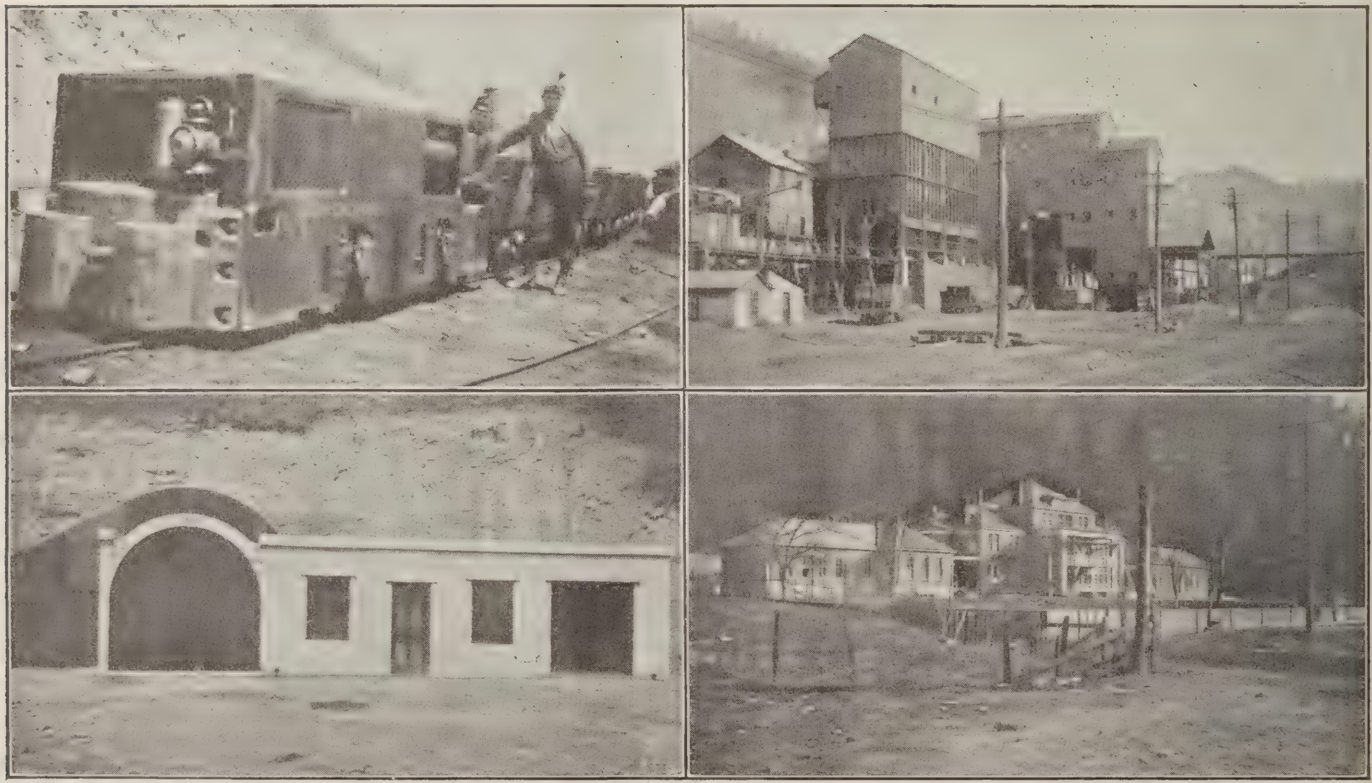
MINERS' HOMES, UNION PACIFIC COAL CO., RELIANCE, WYO.



COMPANY STORE AND HOUSES, COLEMAN MINES, BLANCHE, KY.



A BED OF COAL IN EASTERN KENTUCKY, KNOWN AS NO. 6 SEAM



VIEWS IN SOUTHERN WEST VIRGINIA

Gasoline motor, Gay Coal Co., Logan. Tipple and washery, New River & Pocahontas C. C. Co., Berwind. Mine fan U. S. C. and C. Co., Holden. Miners' hospital, Welsh

The Labor Situation

SYNOPSIS—Frank P. Walsh will act as attorney for Alexander Howat, president of District 14, in suits against J. H. Hazen. President White appoints the officials for District 21.

Some time ago it was alleged that in making the contract between miners and operators in District No. 14 in 1910 and 1912 a large amount of money was raised by the latter and it was suggested that Alexander Howat, the president of that district, and Fred W. Holt, the secretary-treasurer, received about $20,000 of it.

The operators in question formed the Southwestern Coal Operators' Association, and they are alleged to have assembled a fund of $100,000 by assessing the members of that organization. Charles S. Keith and James Elliott were at different times at the head of the association. Franklin Bache was at one time a member, but he left the organization and brought suit against Charles S. Keith for an accounting. In reply Keith declared in court that he had been informed by a detective of the name of Holmes employed by the association that contracts could not be made unless money was used.

Union Officials Said to Have Received $11,250

According to Keith's testimony, it appeared that the detective quoted Alexander Howat's remark that Thomas Lewis and John Mitchell had received money to make contracts and that he proposed to get his before he would arrange for a settlement. Consequently, according to the same testimony, Keith transferred the sum of $11,250 to Joseph H. Hazen to procure the signing of the contract. Under the terms of the arrangement $100 per month was to be turned over to Hazen for another purpose. Keith likewise testified that Hazen told him that he divided the $11,250 between Howat and Holt and that the $100 per month was paid to Howat during the time the contract remained in force.

It is clear that this testimony severely compromised Howat and Holt and the whole United Mine Workers of America, and Alexander Howat himself wrote to John P. White asking for an investigation on Mar. 29, 1914, just at the time that the head of the organization was busied with the making of the biennial agreement. J. P. White, in order to clear the air, required Howat to bring action for slander against those who had made these statements. This action recalls one by John Mitchell when Mother Jones was accused of certain nefarious crimes. He told her to defend her reputation or sever her connection with the union, and as a result she for a long time did the latter. In both cases the persons accused were offered the free services of an attorney to enable them to prove their case.

Of course Keith, in giving his testimony, was defending himself. He was not trying to defame the union, and consequently it would be hard to make a successful charge of slander against Keith. Hazen, however, is thought to be open to a suit, though he himself was testifying in defense of Keith and on the order of the court. The ground for trying Hazen rests on the statements of Keith, Jenkins, Hardin and others to the effect that Hazen declared that he had given the money to Howat and Holt. Even if this was untrue, it was hardly a slanderous statement, for he apparently said it, not for the malicious purpose of hurting those union leaders, but in explanation of what he did with his money.

Hazen's Courtesies Are Thought to Indicate Graft

The attorney appointed by the organization was N. E. Kendall, of Albia, Iowa. He went over the matter with his client, Alexander Howat, and pointed out to him as in duty bound the weakness of his case against Hazen. It seemed to him as he stated later, Oct. 26, 1915, that the case was in some ways quite weak, just as has been explained; but it seemed that there was a further difficulty, and that arose from the evidence of a long-continued friendship between Hazen and Holt. They had been out together to lunches and dinners and on automobile rides and had finally gone to Chicago to see a ball game. It is unfortunate that representatives of labor and capital when they meet must shout their terms to one another from behind trenches. If they exhibit any friendship, both sides and even juries believe that there is some crooked deal in progress.

It is easy to imagine the feelings of Howat when his lawyer told him he had no case. Innocent or guilty, he may have believed that Kendall was no man to conduct his business. He chose J. I. Sheppard, of Fort Scott, Kan., and that attorney refused to have Kendall or anyone else whom the organization might appoint, as an associate in the case. J. I. Sheppard, in his statement on Oct. 26, declared that Kendall's appointment as attorney, or the naming of him or anyone else to interfere with Sheppard's conduct of the case, was a "frame-up" of the organization. In fact, Sheppard looks upon everything in that ungenerous light. He says that the case between Bache and Keith was nothing else, though every evidence is that it was the outcome of some of the bitterest feeling. As an evidence of the artificial character of the proceedings against Keith, Sheppard showed a certified copy of the dismissal of the suit Sept. 26 of this year.

J. P. White Submits Three Separate Plans to Howat

White advised Howat to resign. Howat did so, but attempted to run again for the office, and White opposed the placing of his name on the ballot. A conference was called for Oct. 26 to which the public was admitted. White, Kendall, Sheppard and Howat all discussed this issue, and then White made his proposition. He would appoint Frank P. Walsh as sole attorney if Howat would accept him or he would leave the selection to the four district presidents of the United Mine Workers, or if Howat was ill-disposed to the "capitalistic courts," then White would be willing to see the matter settled in the "courts of our own organization, the international convention which convenes at Indianapolis, Ind., on the third Tuesday in January, 1916."

Ultimately an agreement was signed by which White permitted Howat's name to go on the ballot; Howat accepted Walsh as sole counsel; and White conceded that Walsh should accept Sheppard's services if he desired and that Walsh should be paid by the international organization.

White Takes Complete Charge of District 21

But Kansas is not the only section where there has been confusion. President White has had to take charge of District 21 in Oklahoma, where there is serious internal trouble. The State Mine Workers' Convention at McAlister, Okla., approved his suggestion that he take charge. He has designated the following officers to act for him until relieved by their successors, who are to be chosen at an election to be held within 45 days: President, William Dalrymple, Coalgate, Okla.; vice-president, J. B. Winters, Montana, Ark.; secretary-treasurer, Herbert B. Long, McCurtain, Okla.; executive board: Edward Cunningham, Bridgeport, Tex.; Thomas Sexton, Jenny Lind, Ark.; Ira Decker, Bryant, Okla.; P. R. Stewart, Hartford, Ark. It is understood that none of these men will be candidates for reëlection. The auditors and members of the joint board of the district will remain in office by general consent till after their successors are appointed.

Illinois Miners Drive Militiamen from Mines

Warrants have been issued against Walter Abrams, George Karns and Festus Haley, pit committee in a Hillsboro mine in Illinois, charging them with interfering with workmen because they belong to the militia. The complaining witnesses are Charles Carter, Charles Hill, James Knox, Kieth Hudspeth and James Dugan. When they returned from a state encampment of the militia, the committee refused to allow them to return to work, and charges were preferred against them in the local union and they were suspended. On the advice of Adjutant-General Frank S. Nixon, the men made application for reinstatement, but their request was tabled. The law provides a penalty of $500 for interfering with or discharging a workman because he belongs to the militia. A test case is to be made by the National Guard officers.

Report of Relief in the Hocking Valley District

A report has been filed with Governor Willis relative to the relief work in the Hocking Valley District of Ohio. In it Col. Edward C. Bryan, assistant adjutant-general, states what the department has done to aid the miners and their families. In all, 12,764 persons were assisted and 17 carloads of food supplies were sent to the district for distribution.

In addition there were 30 miscellaneous shipments of supplies. The food was distributed from commissaries established at Nelsonville, Chauncey, Poston, Congo, Orbiston, Glouster and Lathrop. The financial statement of Colonel Bryan shows that the sum of $13,142.54 was spent for food, the Cleveland chamber of commerce donating $1,000.

Editorials

Anthracite Miners' Demands

It is quite probable that when the time comes to discuss the proposed change of wage in the anthracite region someone will industriously dig up the average cost for mined and washery coal in 1909 as given in the United States Census Report—namely, $1.34 per long ton—and then calculate what a 20-per cent. increase on that figure would mean. He will advance the argument that a 27c. increase in the price of coal will provide the companies mining anthracite with all the return necessary to make the needed increase to their men.

But first of all it must be remembered that the demands are not limited to a simple increase in wage. The day laborers are asking for an 8-hr. day, and *Coal Age* hopes they will get it. But this is quite likely to result in an increased cost. It may be possible to hope that the men will speed up the work and put all the work in eight hours that has been strung into nine hours or more, but it is easier to hope this than it will be to secure it.

In the miners' demands there is no promise of that kind. Unfortunately there is only a surly, "We demand," and there is no evidence that with it is combined the promise, "We concede that we ought to do a full day's work in eight hours." If it can't be done, then surely the operator has a right to ask a further concession from the public for the time lost—a concession which must be figured on the domestic sizes and not on the coal as a whole, just as must be the increase in the ton price and in the day-wage rates.

Nor in regarding the problem must we forget the new demand for extra pay for overtime and holiday work. Consideration of both these is unfortunately necessary, for much work has to be done when the mines are idle by men who normally are employed during the day. In fact, inducing the operator to do much of his repairing and construction wholly during specified hours is to make it only more certain that the regular day labor will be interfered with, making it less possible than before to do the day's work in the time formerly devoted to it and still less feasible to do it in the shorter time provided in the schedule. It will also tend to interfere with the miner and make it harder for him to put out his daily quota. However, this is less important, as the present output certainly does not represent his full ability to produce coal. And yet it must be conceded that this interference is important to the miner, for he will often go home rather than wait till the difficulties delaying his work are adjusted.

These two items—greater cost of overtime and shorter hours of day labor—must be remembered in weighing the increase in cost of coal, and the figuring on them is left to the last because they are somewhat elusive and not at all because they have no legitimate weight. The two demands are important and might with some of the companies be found to involve an increase of 20 per cent. in day wages in addition to that directly demanded.

It will apply of course to the day workers only. But it must be remembered that the day men, though not as well paid as the miners, constitute a large percentage of the gross number of workingmen in the anthracite region. One-third of the men employed by the anthracite operators are day hands. Roughly each working unit—miner and mine laborer—makes necessary the services of one day hand.

Since the Census Report of 1909 the wage agreement of 1912 has secured for the miners an increase of 10 per cent., but the sliding scale established in 1902 after the great strike was by consent abolished. This sliding scale was 4½ per cent. higher than the basing rate, so that the increase in 1912 was only equivalent to a raise of 5½ per cent. This would make the labor cost of producing anthracite at the present time $1.37 per ton.

An advance of 20 per cent. would mean therefore an increase of 27.4c. per ton, which on the production of 81,000,000 long tons in 1914 would amount to nearly $22,000,000. But of this total production approximately 8,500,000 tons was used in the operation of the mines and about 19,000,000 consisted of buckwheat, rice and barley, sizes which were sold in competition with bituminous coal. The price at which these steam sizes of coal are sold cannot be advanced unless the bituminous competitors are obliged to make a like concession, so all the adjustment must be on the prepared sizes. Steam sizes find competitors in the bituminous coal output of the country, but the domestic trade in anthracite is faced only with the far less important competition of coke.

As the prepared sizes amounted to only about 53,000,000 tons in 1913 the increased cost of $22,000,000 must be spread over that tonnage, thus adding 41.5c. instead of 27.4c. per ton to the selling price. As stated, however, a third of the men are asking for a rate which might be equivalent to another 20 per cent., and if every demand were granted, an increase of 57c. per ton might be necessary to satisfy the demands of the miners.

But in all this calculation the item of salaries has been overlooked, and indications are not wanting that the men who are paid by the month will expect an increase of remuneration. Some in the past have regarded themselves as subject to the increases in wages granted in wage adjustments and have demanded increased pay through the Anthracite Commission. It must be remembered that "salaries" in the census returns "includes all payments to officials, superintendents, managers and salaried employees in general offices, as well as the payments to salaried employees at the mines." So, clearly the 6.33c. per ton for this item would add $5,127,300 to the bill. Spread over 53,000,000 tons of prepared sizes, the additional cost will be 9.6c. per ton. Consequently we may find that about 67c. and not 27.4c. is the correct answer to the momentous question, "How can the mine workers' demands be satisfied by a rise in the selling price of anthracite?" And it is fair to ask if the public is willing to pay the rise in price thus involved.

Why Set the Living Wage?

A certain brilliant German ophthalmologist, Von Helmholtz, declared that if a normal human eye were sent to him by an optician he would be disposed to return it because of its obvious defects. As a matter of fact, eyes, even the best of them, are not perfect. All of them have a dark spot, a certain degree of astigmatism, a limited range of focus, chromatic aberration and other faults, and doubtless Von Helmholtz would advise that eyes would be more effective if put farther apart so as to increase the breadth of view of objects seen at a near range.

But Von Helmholtz's remarks relative to a model eye have attracted little attention. Eyes are as we find them, defective or otherwise. We may imagine other eyes with greater powers of accommodation, with a spotless retina, without any astigmatic imperfection, but such visions serve no useful purpose. We are face to face with conditions as we find them.

The living wage is an abstraction like the perfect eye. What we mean by a living wage is not the minimum with which it is possible to hold mind, body and soul together, but a wage promising the recipient a certain degree of comfort for himself and his family. No one will doubt he can in some manner live on less. In fact the living wage proposed by the investigators would provide a certain more or less perfect condition of affairs and rebuild the world, just as Von Helmholtz would remodel the eye. But we are face to face with economic conditions in the one case, just as we are confronted with the eye of biology in the other.

Is there economic room for every individual to enjoy that particular "living" wage which happens to be popular (for even the advocates of this manner of determination admit that the standard varies not only with the cost of necessaries, but with the nature and quality of the necessities included in the bill of particulars)? That is the really important question—not What do we want? nor What do we think is desirable? but What conditions actually exist? We live in a plain workaday world in which ideals must always be circumscribed by realities.

Something must be put aside year by year to provide new capital, but if everyone obtained an approach to the living wage advocated, it is certain that not only would there be nothing added to the national resources, but year by year these would be depleted.

What is needed is a general increase of efficiency, both in the work done per day and in the number of days worked. Neither employer nor employee is doing his full part to secure that end. When it is done, the living wage proposed will be readily secured, because the wealth of the world will be able to satisfy it. But meantime a new living wage scale will be elaborated behind which the provisions of our economic status will continue to lag. Quite obviously does our living wage change. No one will deny that an investigator would arrive at a much larger figure if he were determining the cost of living for Americans than if he were assessing it for Bulgarians, for instance, even if prices in both countries were the same.

Wages must be regulated always by the output of labor and by the amount of that labor that we desire to have fixed annually as capital, and they can never be wholly determined on the basis of our wishes or imagined needs. The individual economic status is, like the human stature, not to be modified by our wishes or our fears.

May Change Anthracite Sizes

At last a movement which promises to afford a long-needed relief to anthracite coal buyers and dealers and the transporting lines, as well as a reduction in preparation costs to the producers, seems to have assumed definite proportions. This movement is one established to readjust in a radical manner the now too-numerous hard-coal sizes.

According to rumor, conversations between operating companies have so far progressed that it has been determined that the change in sizes is not only feasible, but that it will conform with the needs of consumers. Certain sizes have been in such great demand in some seasons that the production has not been in any way adequate to the filling of the orders, and it will therefore not surprise the selling public if a change should be made at any time.

So far only the operating officials of the anthracite industry have discussed the matter, and naturally these men lay particular stress on the simplification in preparation methods and equipment which will follow the new schedule of sizes if adopted. It is expected that the selling companies and agencies will soon be consulted and that they in turn will "converse" with the buyers and dealers to ascertain how the idea will strike them and their public.

The second party at interest in the proposed change would be the transportation lines, which are now too frequently congested in their efforts to move trains containing cars laden with eight different sizes. For these different cars have to be dropped at various stations or dumped at the piers in a very different order from that in which the train is made up. In making up trains alone, much valuable time would be saved the roads and ultimately the coal buyer by a reduction of the number of sizes.

The coal dealers will be the chief gainers, because where they now must in most instances stock eight sizes of anthracite coal or more, some smithing coal and a couple of other hard or soft fuels, the anthracite sizes they would carry in the proposed plan would be only four. These sizes, too, would more nearly fit the consumer's requirements, and a slight reduction in prices on some sizes and no anticipated advances should make the movement popular with all buyers.

Tentative plans embrace the adjusting of broken and egg sizes into one, to be known perhaps as furnace; stove coal to remain as at present, but probably to be called small furnace or large range; chestnut and pea coal might be combined into a uniform size that could be called range; buckwheat No. 1 should remain unchanged, on account of its being known as the poor man's fuel in some sections and the economical man's coal in other places; rice and barley coal may be mixed as steam coal. It is also added, as the propaganda goes around, that the operators can further economize in their own fuel consumption by using pulverized culm, as is done at the Hauto plant of the Lehigh Coal and Navigation Co.

Economy all the way down the line is the sole purpose of the whole plan—for the producer, carrier, buyer, dealer and consumer. Thus far it must be remembered, however, that, in the language customary to the daily press, the affair has not progressed beyond the conversational stage, though it is to be hoped that action will result.

Sociological Department

Annual Fete Day at Ellsworth

By R. Dawson Hall

SYNOPSIS—Ellsworth's great annual festivity is not exactly duplicated anywhere else in the country. In no other coal-mining town are all the social activities so skillfully coördinated. The pupils at the school, the foreigners in the folk dances and the miners in their first-aid drill all regard the day as their own.

The fête day at Ellsworth officially goes by the title of the Annual Mine Safety Demonstration of the Ellsworth Collieries Co., but it is badly named for several reasons, for it is now by no means merely a mine-safety meet such as we are all acquainted with and have seen almost at every place where there are coal mines. Then again the Ellsworth Collieries Co. can hardly claim it, for it seems to be the private and exclusive property, not only of the managers of that company, but of every child in the Ellsworth schools. Many of the scholars too young to know the name of the beneficent company providing the fête day and even unable to recognize the men in charge of the festivity nevertheless will look forward to its recurrence and will recall the day with pleasure.

THE POINT OF VIEW FROM WHICH THE ELLSWORTH CHILDREN REGARD THE COAL-MINING PLANT

The company has so far succeeded in making the work so popular that its own action seems to fall naturally into the background. This was only the fourth annual fête day, but already there is hardly any room now for further development and improvement within the limits of a single day.

The demonstrations may have originally been instituted to press forward the first-aid idea, but the sociological superintendent is a teacher and not a doctor, and he has consistently brought forward the educational features and done it most successfully, for he has all those qualities which made Froebel and Pestalozzi so useful to their fellow men.

After all, if we get safety in the mines we will arrive at it largely by education and by inducing everyone from the child to the full-grown man to contribute his mite to that end. Furthermore, safety is only first at best and not the sole end of life. There is still room for happiness and intelligence as an aim of living, and in Ellsworth and Cokeburg, these good things are being sought and the way in which they can be attained is being illustrated.

Kindergartens, Night Schools and Manual Training

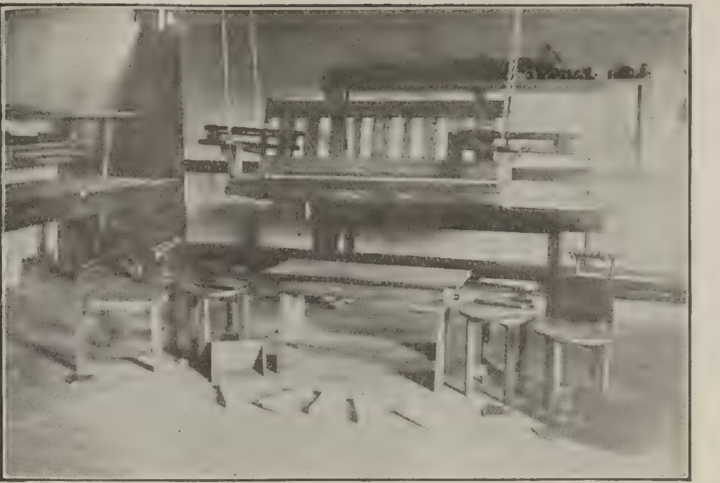
At 10:17 o'clock the train arrived from Pittsburgh with the special car containing the mine officials and the guests of both sexes. This was followed by an inspection of the Ellsworth school, an institution which is remarkably well organized. E. E. Bach is the superintendent of both the Ellsworth and Cokeburg schools. J. W. Sprouls is principal of the former school, and he has two male and seven lady assistants in the regular school work. At Cokeburg, a town about 3 miles from Ellsworth, the principal is E. C. Snyder, and he is aided by five lady assistants.

But despite the excellence of these provisions for the children there would be nothing remarkable were it not for the work of the special departments and the night school. In the daylight schools Margaret Mooney teaches household arts; George C. Donson, shop work; Edith McComb and Edith Blythe are instructors in the kindergarten. The playground is supervised by the household-arts director, Miss Mooney, and the two kindergarten instructors, Misses McComb and Blythe. Dr. G. H. Smith, with Alberta Campbell, takes care of oral hygiene.

The night school has the following instructors: Mining technology, M. D. Cooper; mining law, D. E. Smith; English for foreigners, John Docktor; household art, Margaret Mooney; stenography and typewriting, Dora Little; shop work, George C. Donson; common branches, E. E. Bowman, and English for foreign women, Ethel Cablk. In the continuation school Ethel Cablk has a class in sewing and fitting.

The scholars were not given a holiday in the early morning of the fête day, so the pupils in the kindergarten were playing at rolling ball and the older scholars sang their songs when the visitors passed through the schools.

OFFICIALS' CLUB ROOM, WHERE LUNCHEON WAS SERVED BY HOUSEHOLD-ARTS CLASS



MANUAL-TRAINING ROOM. WHEN VISITED IT WAS CROWDED WITH PUPILS HARD AT WORK

This was followed by the fire drill down the excellently ample fire stairway in the rear of the building. As the hill slopes up behind the school, the distance from the upper rooms to the ground is much reduced. School in Ellsworth seems to have lost all its terrors for the small folk.

After the inspection of the school proper the visitors went to the dancing platform, where the Slovaks, Russians and Italians danced their folk dances in native costume. These gay garments with their amazing embroidery were brought over by the dancers from the countries of their origin, and they were much admired by the ladies. So anxious was everyone to view the costumes that the carefully arranged program almost suffered from the delay.

A PANORAMIC VIEW OF THE FIELD WITH THE OFFICE BUILDING IN REAR

AMERICUS PARDINI'S ADULT BAND PLAYING DURING THE LUNCH HOUR

After the dances a visit was paid to the manual-training department, where several young men were hard at work making furniture. On exhibition were swings, towel rollers, tables, benches, stools, tabourets with woven tops, tooth-brush racks, bench hooks for sawing and shoulders for ironing sleeves—all made and well made by the pupils. The work would stand the most minute inspection. On the walls were industrial exhibits of various kinds, but mostly electrical, such as fuses, carbons and storage-battery parts. The guests also viewed the wonderful needlework and embroidery, much of it done by the foreign women.

Then followed the dinner prepared and served by the domestic science class of the Ellsworth-Cokeburg schools,

THREE VIEWS OF THE FOLK DANCERS IN THEIR PICTURESQUE NATIVE COSTUMES

VIEW OF THE MINING PLANT AND PLAYGROUND FROM THE SCHOOLHOUSE

H. V. TEMPLE AWARDING THE PRIZE CUP. IMITATION MINE ON RIGHT

the materials used being products of the Ellsworth farms. The menu was as follows: Consommé and croutons, fried spring chicken, buttered beans, escalloped potatoes, veal croquettes, Parker House rolls, nut bread, stuffed-tomato salad, marguerites, ice cream, cakes, mints, salted nuts and coffee.

Admirable Music from Two Large Local Bands

And then there were the bands. It is customary to applaud them and say they are the best in the state. There are so many of these best bands that it is easy to lose count of them. But the Ellsworth bands are certainly wonders and reflect remarkable credit on Americus Pardini, the director. There are two bands, one of boys and one of men, both large organizations nattily uniformed in white and both most capable aggregations. A barytone solo was rendered by Vincent Sikora. Miss Olive Painter sang a solo and with J. H. Hamilton a duet. M. F. Angotti played a cornet solo. As a background for this duet and these solos, several classical pieces were played by the bands.

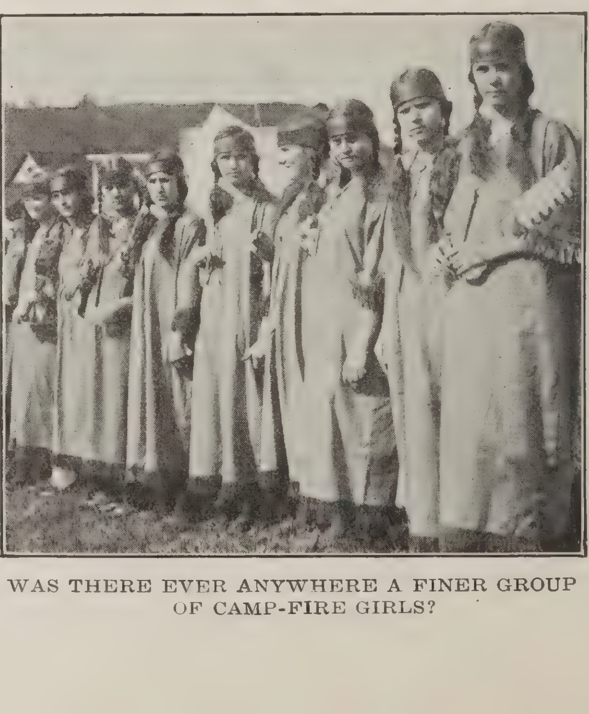
The mine-safety demonstration was preceded by the grand march of the children from the Ellsworth and Cokeburg schools, each holding a tiny flag. Perhaps nothing else was more appreciated by the spectators than this little flock of humanity in gala attire and so full of life and excitement that decorous marching was out of the question. The expression "dance past" the grandstand would better fill the bill than the more usual "march past" by which it is usually described or "straggle past" as it is too often in reality. There was a special grandstand provided for these children.

After the children were duly settled and presented with edibles to stay them during the contest, the first-aid men lined up in three rows, each containing 15 teams of 6 men, or 270 men in all. The front rank was taken by the teams of mine No. 1. Back of it were ranged those of mine No. 2, and farther back the teams of mine No. 3. Each group of teams performed a separate problem, and when the judging had been done the patients were removed on stretchers so that room was left for the teams behind to come forward and perform their event.

One Hundred Trained Men at Each Mine

The Ellsworth Collieries Co. does not employ a vast number of men. At its three mines it has 347, 398 and 359 men respectively. Now 90 trained men from a mine means a wonderful percentage and shows how first-aid work has been spread. But in addition there is a mine-rescue team at each mine and an ambulance squad, so instead of 90 trained men at every operation there are an even 100. The percentages of men prepared to aid

THE CHILDREN DIVIDED THEIR ATTENTION IMPARTIALLY BETWEEN THE EDIBLES AND THE EXHIBITION



WAS THERE EVER ANYWHERE A FINER GROUP OF CAMP-FIRE GIRLS?

in times of accident are 29, 25 and 28 per cent. respectively.

The sociological director is endeavoring to get everyone interested. Even the long-bearded Russians have at last been induced to take part. They are perhaps still a little crude and disposed to perform their work with more slapdash than such delicate operations require. But time and experience will cure this as all other things, and in the long run the Russians will learn that the manner of operation is as important as the work to be done and that giving first aid is not like setting a prop or loading a car of coal.

The scores of all the teams, both in first aid and mine rescue, from any one mine were added, and the mine with the highest score received the company's cup. The judges of the events were all doctors, Dr. D. E. Sable, fire and police surgeon of Pittsburgh, representing the American Red Cross, being in charge. Drs. G. K. Hays, J. W. Allen, L. W. Hoon, G. T. Linn, R. V. Stewart, P. M. Wall and J. G. Warner, from Monongahela; Drs. W. H. Lewis, M. H. Day, from Donora; Drs. J. W. Hunter, V. P. Vieslet, C. B. Hiller, from Charleroi; Dr. L. M. Mitchell, from Belle Vernon; Dr. John Farquahar, from California, and Dr. T. B. Herron, from Monessen, formed the judging staff.

A ROW OF FOLK DANCERS

After the first-aid events a mine-rescue demonstration was held. For this a large gallery had been erected. An explosion was realistically simulated, after which an injured miner was to be rescued. C. G. Brehm, of the Oliver & Snyder Steel Co., and Harry and George Millward, of the Tower Hill-Connellsville Coke Co., were the judges.

The cup was then presented by Congressman H. W. Temple. Red Cross medals will also be awarded to the first-aid team making the highest percentage and Red Cross certificates to the teams making the second and third highest percentage. This will doubtless take a further test, for five teams secured 100 per cent.

After these events lunch was provided for the participants in the demonstration, and a moving picture was run off for the visitors, but unfortunately most of these had to leave early because the hour for the last train had arrived.

The work of the 13 Boy Scouts and 17 Camp Fire girls should not be overlooked. They certainly made the event pass off without a hitch. The girls especially, who gave their attention to the children taking part in the pageant and viewing the contest, proved their value in such events.

Much credit should be given E. A. S. Clarke, the president of the company, and W. A. Luce, the assistant general manager, for the excellent social work being done at Ellsworth under the immediate control of E. E. Bach, the superintendent of sociological work and of the schools.

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First-Aid Car Equipment

The emergency or fire-fighting car of the Philadelphia & Reading Coal and Iron Co. contains the following equipment:

9	Draeger oxygen helmets (company has 43 in all).
1	Fleuss oxygen helmet.
2	chemical fire extinguishers and charging cans.
3	pulmotors (company has 5 in all).
1	inhalator.
1	Johnson & Johnson No. 1 cabinet.
6	electric S. B. searchlights, portable.
10	type-B Hubbell hand lamps.
9	type-H Hubbell hand lamps.
4	type-M Hubbell hand lamps.
1	oxygen pump.
13	oxygen tanks.
	Cots, mattresses, bedding, for camping on the job.
1	Aldrich triplex pump for fire use.
1	8-hp. gas engine.
2,000	ft. 4-in. wrought-iron pipe.
8,125	ft. 2½-in. rubber hose and nozzles.
20	spray pipes.
	Wrenches, hatchets, axes, saws, shovels, hammers, bars, nails and all small tools.
	Stretchers, oiled suits, lanterns, Davy safety lamps, rope, block-and-tackle rigs, 2 wood and 1 iron telephone sets.
9,540	ft. telephone cable, insulated.
1	cook stove.
1	generator set, switches and all accessories.
2	rolls of fireproof brattice and 10 rolls of nonfireproof brattice, 240 yd. in all.

The same company has 1,740 men who have been trained in the wearing of helmets.

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Sociological Notes

The Holy Name Society in Pittston, Penn., in connection with St. John's Roman Catholic Church, has started a class to prepare mine workers for the mine foremen's examinations. The class will meet at the new clubhouse of the society and be instructed by George V. O'Hara, mine foreman of the Pennsylvania Coal Co.

The Miners' Federation at Nottingham, England, on Oct. 7 passed a resolution in favor of the abolition of electrically driven coal-cutting machinery. They also demanded an 8-hr. day for outside men and a minimum wage of 5 shillings, or $1.21, per day for adult workers. A resolution advocating the starting of work at 8 a.m. instead of 6 a.m. was rejected. The British Government was asked to amend the Old-Age Pension Act so as to reduce the age at which pensions were granted to 65 years and to make the pension not less than $1.82 per week.

At Trotter, Continental No. 1, United and Footedale, plants of the H. C. Frick Coke Co., first-aid meets were held on Oct. 7. At Trotter, Davidson, Youngstown and Leisenring No. 2, all scored 97⅓; Coalbrook and Juniata, 96; Leisenring No. 3, 95⅔; Trotter, 95⅓; Rist 92; Adelaide, 92; Leisenring No. 1, 92, and Buckeye, 89⅓. At Continental, Continental No. 1 scored 98; Lemont No. 1 and Continental No. 2 each 96; Kyle, 92; Lemont No. 2 and Oliphant, each 90; Collier, 88; Continental No. 3, 87; York Run, 81; Wynn, 80; Redstone, 79, and Shoaf, 75. At United, Southwest No. 1 scored 100; Standard, 99⅓; United and Calumet, each 98⅓; Brinkerton, 97⅔; Hecla No. 2, 97; Mammoth, 96⅔; Whitney and Hecla No. 1, each 95⅔; Hostetter and Baggaley, each 95; Dorothy, 94⅓; Central, 93⅔; Hecla No. 3, 41⅓; Marguerite, 90⅓. At Footedale, Colonial No. 4 scored 98; Edenborn, 96⅓; Buffington, 95⅔; Colonial No. 1, 94⅓; Gates, 94; Ronco, 93; Leckrone and Lambert, each 91½; Footedale, 90; Filbert, 88⅔; Colonial No. 7, 87; Bridgeport, 86⅔, and Dearth, 73⅓. The three events submitted at each of the four plants were identical, so that the ratings are strictly comparable, and Southwest No. 1, the only team with a perfect score, may be acclaimed the winner.

Discussion by Readers

Store Checks vs. Thrift

Letter No. 1—I was glad to see the Foreword in *Coal Age,* Oct. 16, p. 619, drawing attention to the evils of the store-check system. I have no objection to a properly conducted company store, which is an absolute necessity in many communities removed from a town.

In the conduct of such a store, however, it should be recognized as a good business principle that every outlay of capital is entitled to a fair return on its investment. Too often has the company store played a dual part and been required not only to make a profit on its capitalization, but to carry the burden of other departments of a coal-mining company by making good the losses sustained in those departments. When the company store is thus used as a support for the operating end or for the sales department of the mine, its profits can hardly be said to be legitimate. Every branch of the company's business should be made to carry its own burdens.

When the profits of a store are made to cover operating expenses, it means that the miner who produces the coal is taxed to help the consumer pay for its use. The miner does this by the high prices he is obliged to pay for his goods at the store. While such practice may not be dishonest, it is certainly questionable.

The Loan-Shark Evil

Another objection to the store-check system is the opportunity that it affords the speculator, who takes advantage of the necessity of the one holding the checks and redeems them for cash at a large discount. This practice is similar to what is known as the "loan-shark evil," since it robs the laborer of a good percentage of his hard-earned wages. Checks so redeemed are presented on payday, and the speculator receives the full amount of cash that they represent, in return for the money he kindly (?) advanced. I have known of clerks in the offices of coal companies who made more each month by such practices than the amount of their salary. Where the bookkeeper is also the paymaster, as often happens, the transaction is a simple and easy one. Too often these checks are redeemed at the saloon, whereby the bartender makes a double profit by the discount on the checks and the sale of his liquor.

Another Aspect of the Case

Both the store-check system and an unlimited credit on the store books are a source of evil and not only throw a burden on the man himself, who takes advantage of the system to run in debt to the store, but on his coworkers in the mine, who suffer as a result, and the company is likewise a loser in the end.

The system operates as follows: The man who runs up a high bill at the store or overdraws his account often succeeds in getting the best places in the mine where he can make the most money. He is generally wise to this fact. The foreman is notified of the man's indebtedness, and to assist in squaring the debt, that man is shifted to a place where he can make more money, while the thrifty man who pays his bills regularly each month must take anything he can get, his name remaining on the waiting list.

In such mines one often finds a half-dozen incompetent men doing the work that could be accomplished by four or five men who are experienced in the work. In like manner the man in debt at the store is likely to be the one called on for extra work, nights and Sundays, or he is kept on the payroll during periods when the mine is idle and often to the exclusion of better men.

It may not be the intention of the company to show favoritism, but where credit is extended at the store to employees, it is only natural that the company should wish to square the accounts by every means in its power. Such practices, in effect, place a premium on incompetence and improvidence, since the men are not slow to avail themselves of the advantage thus afforded them. This condition is generally avoided where an agreement exists between the miners and operators, because the contract is so worded as to provide equal treatment for all employees.

Comparison of Workers

A simple comparison of the thrifty man with the hand-to-mouth or improvident man shows that, while the former is a creditor, the latter is always a debtor. The one has learned that his welfare depends on efficient and conscientious work—he believes in giving an honest day's work for an honest day's pay. On the other hand the improvident man believes that more is to be gained by keeping in his employer's debt. He systematically neglects his work, which is below par. He counts on his indebtedness to the company as his best protection. It is clear that a few such men greatly reduce the efficiency of the mine and destroy the morale of the working force. As thrift spells efficiency in a workman, improvidence is invariably synonymous with incompetence of the worker.

What Is the Remedy?

There are probably other evils that will be suggested in the further discussion of this subject. I have mentioned the above as they occurred to me, without much thought of sequence. The chief question, however, is, What is the remedy for these conditions? The first step, no doubt, is the recognition of the evil by operators and employees alike.

There are men who believe the system to be good. They consider that the miner's indebtedness acts as a restraint on the upward tendencies of the cost of living and the downward tendencies of wages. The debtor system, often regarded as a club, is generally wielded with greater effect in favor of the mine worker than of the operator. It is far more to the interest of the latter to promote thrift among employees than to encourage them to run in debt. The aim should be to encourage thrift as a means to more comfortable living rather than attempting to force men by this means to accept hard conditions in the mine.

In my opinion the company store should be run independent of all other operations of the company. The business should be conducted on the same plan as that of an independent merchant. Goods should be sold for which there is the greatest demand. The price should be such as to yield a fair profit only, and miners should not be discriminated against because they may choose to trade elsewhere. Trade should be won by fair dealing.

On the same ground that miners refuse to extend credit to the company by continuing to work if not paid on the regular payday, the store could refuse to extend credit for goods when payment for the same is not promptly made. If the miner finds himself unable to secure unlimited credit, he will soon discover suitable means to provide against any ordinary emergency. Necessity is responsible for many of our virtues, one of which is thrift. GEORGE N. LANTZ.

New Straitsville, Ohio.

Letter No. 2—It is all very well to let one's sympathy run riot as regards store checks or "scrip," especially if that particular one is totally unfamiliar with the practical operation of a coal camp, but the vicious maligning of the "scrip system" is only in keeping with the multitude of erroneous ideas that people, who work above ground, harbor with reference to coal mining in general. Moreover, it is not fair to condemn the evils of a mining camp without pointing out its virtues.

In the first place the practice of "peonage," the abuse of workmen, exorbitant profits, etc., have long been things of the past, and in their place today we have the average coal camp conducted along practical business lines. With the present existing labor conditions, the average coal miner is a free agent in every respect. It is not ill treatment at the hands of coal-mining officials that is spoiling the coal miner of today, but the unmerited sympathy of a vast army of people who have no actual knowledge of the conditions, but are swayed by magazine writers and newspaper reporters. The latter class are either criminally guilty of misrepresentation or irresponsible.

ACTUAL CONDITIONS MISREPRESENTED

The average magazine or newspaper article is usually a joke (if it were not so serious) in the eyes of practical coal-mining men. Nevertheless, it is the popular idea that we are a class of pirates. Popular opinion seemingly does not consider that the days of slavery are gone and that we are subject to scrupulously close investigation by the mining department of the state, the same as are purveyors of groceries and drugs sold under the pure-food law. With work as plentiful as it usually is in this country, an abused workman in any class of labor is not slow to quit his job, particularly a coal miner. But you never hear of a coal miner ever following another profession. Why? Because when he does work, and he usually works only when he pleases (imagine him pulling off that stunt in the average factory!), he earns a larger wage than is paid per day for any other class of labor.

Now the crux of the situation is the fact that these same high wages permit him to work as he pleases and to squander his money during the periods of idleness. The high wages paid to miners are directly responsible for the general clamor for a lower priced fuel. In other words, this shiftless labor is a creature that we coal men have on our hands and for which we are not responsible. Now, are we going to let them starve because they are shiftless? Can we, in this Twentieth Century, reform the world when it has not been done in the ages passed and gone? Were we to refuse to advance some miners money to secure picks, shovels, powder, etc., they could not work. That is one thing that makes scrip a necessity.

Second, their wives and children are waiting to eat until payday arrives. Shall we turn them down and say, We are going to teach you thrift. Quit your kidding! Did you ever cut "scrip"? No. Well I have—thousands and thousands of dollars' worth; and I know that the good it did the women and children *must* be taken into consideration. It is true miners are reckless with scrip. So are they with money. It is the same old story—come easy, go easy. What are we going to do about it? Are we our brother's keeper? We know women and children must eat. Ideas are all right—but to eat is vitally practical. I have scratched my head many a time wondering who was going to foot the bill if I let them eat.

PROFITS OF COMPANY STORES

Now about this store-profit business. In the average coal camp, profits are figured as a certain percentage of the investment, and that is not nearly in keeping with the percentage figured by the ordinary grocer in a city of any size. I have lived in both places and know this to be the fact.

If I abused my workmen any more than any coal operator who may read this article does his, my men would leave me. If I overcharged them for their goods, they would buy elsewhere. If they bought elsewhere or if they left us, our mines would cease to run. Anybody, however badly informed he may be, knows that the coal production of this country is enormous. Politicians are too thick, and we all know that they would make capital of any disgression in the coal business, the same as in any other industry.

Again, the Federal authorities operate a certain department, which makes special reports to the Government in respect to mines, just as they report conditions in regard to hotels and other public utilities. These reports, I have been informed by the officials, are not made public, but the Government has ample access to them.

As regards thrift among our miners—sure, we encourage it all we possibly can; for we realize the value of a steady independent workman, and incidentally, we never have any trouble whatsoever with this class of workmen. They never complain or strike, but they own automobiles and soak money away in the large banks in the various cities that operate foreign departments.

It seems the public in general does not want to know the truth about mining conditions, but would rather read a virulent article written by someone who went through the mining district on a Pullman. G. E. WEBER.

Cincinnati, Ohio.

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A Flooded Mine Proposition

Letter No. 1—Referring to the inquiry of Wm. W. Miller, *Coal Age*, Oct. 16, page 646, I will say that the building of a dam, as he stated, across both entries is in my judgment the best thing that could have been done under the circumstances. That work, followed by getting the pumps in place as quickly as possible, was no doubt the means of saving the mine.

I could not approve the idea of building a permanent stopping across the face of room 4 or any of the adjoining rooms. Assuming this could be done and the dam made sufficiently strong to withstand the pressure of the water, it would still be unsafe to work the rooms in that section of the mine, because it would not be known at what moment the water would be tapped again. Of course this means that further work in that block of coal must be stopped or the chance taken of being compelled to build a stopping in every room. Neither could I approve the plan of drilling holes from the surface through which cement grouting could be run into the rooms.

My plan would be to pump all of the water out of the old mine and then have those workings carefully examined by competent miners, in company with the mine manager and mine foreman. My motto is always "Safety First," which means to cut out every possible danger. It is well known that miners are always loath to work in a mine where there is danger of water breaking into the workings. However, seeing this was a drift mine in a flat formation, there is little to be feared in respect to a great water pressure. Had this been a slope or a shaft mine, it would have been a different proposition, and another plan would then have had to be adopted.

Republic, Ala. FIREBOSS.

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Labor in Bituminous Mines

Referring to Geo. S. Brackett's comments in reply to my letter, both of which were published in *The Colliery Engineer,* October, 1915, p. 161, permit me to add a few words in justification of my previous statement criticizing his article on this subject, which also appeared in *The Colliery Engineer* for September, p. 99. In doing this, I do not wish to prolong the argument, but desire to say that I do not think I misunderstood the expression used by Mr. Brackett in his article.

INFLUENCE OF MANAGEMENT TO REDUCE COSTS

Mr. Brackett states plainly, at the beginning of the article, "The management at a mine has comparatively little influence over the mine-supply costs." In reply to this, I want to reiterate my previous statement, "The management at a mine has a very large influence over the mine-supply costs, which can vary 100 per cent. or more according to the care and vigilance exercised in watching that part of the costs." In my opinion the influence of the management is proportionately as great over the total expenditure as over the cost for labor. It is true that, as Mr. Brackett states, the costs for labor are far in excess of the supply costs, but I claim that the local management should exert the same influence over the one as over the other. I admit, of course, that if the percentage of saving is the same in both, the economy effected will be greater in the one case than in the other.

VIGILANCE REQUIRED TO PREVENT WASTE

In his letter, Mr. Brackett says, "Ties or props wasted in old rooms are there to be seen many times before they are finally covered up." While this is true, unless the matter is given special attention, such unused ties and props are not seen and soon become lost to view, being covered with a fall of roof or other waste material. The point I wish to emphasize is that, since these matters can be given attention, the local management is responsible for the influence it is possible to exert on the supply costs.

I might give further examples of the waste of material in mines and the possibilities of eliminating this waste and reducing the cost of production, but every experienced mine manager is already familiar with these points, and I will not enlarge on the items mentioned in my previous letter, which are sufficient to illustrate my contention that strict vigilance is necessary to prevent large leaks in supply costs. In this connection and to further emphasize this claim, I would refer here to Lehman G. Hauger's article on "Practical Economy at Coal Mines," *The Colliery Engineer,* October, 1915, p. 128, and H. H. Warner's article entitled "Handling Mine Supplies," *Coal Age,* Oct. 23, p. 665. EDWARD H. COXE.

Knoxville, Tenn.

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Responsibility of Miners

Letter No. 2—In the letters written for *Coal Age* I have observed many references to the plainly visible changes that are taking place in the attitude of miners toward coal operators. In what I have to say I am not going to enter a protest against labor unions or the organization of miners for their own protection. I do not wish to criticize any effort made to better conditions in mining, either in respect to employer or employed. I believe that labor unions can be made of great benefit, not only to the working classes, but to operators as well, provided they are properly conducted and not permitted to be controlled by a few paid organizers whose constant aim is to stir up trouble among the men.

LABOR UNION METHODS ANALYZED

Too often union officials claim that all members of the union are entitled to weekly benefits when they unite to fight their supposed grievances. They are willing to pay these weekly benefits during a strike; but I would ask, When has a local union ever paid the rent bill or the store bill of one of its members who was in need, during a time when the mine has been closed for lack of orders?

There is a responsibility resting on the miner for his action in supporting, without sufficient cause, any proposition that will throw the mine idle for an extended period. Miners suffer more as a result of these enforced periods of idleness than the coal operators themselves. Compare the attitude of the local unions in this respect with that of many large coal companies. While it is claimed that union miners get more money for their labor and work less time than nonunion miners, it is a fact that many of the larger coal companies are paying their men more than is paid for the same labor in organized mines.

THE H. C. FRICK MINES NOT ORGANIZED

This is true of the H. C. Frick Coke Co. whose mines are unorganized. The men working in these mines never know of an increase in wages till the same is announced and never make a demand for such increase. When business conditions permit, a notice is posted by the company, stating that an advance of 10 per cent. will be made in the pay of all mine workers. This treatment does not correspond with the claim often made by union miners that coal operators maintain a brutal attitude toward their employees. It is to be hoped that mine workers will realize more and more their responsibility in respect to the proper control of their unions.

RESPONSIBILITY OF MINERS WITH RESPECT TO SAFETY

There is another responsibility resting on the miner respecting his attitude toward his own safety and that of his fellow-workers. I have been much interested in reading the letters on "Prevention of Mine Explosions." While many good suggestions have been made, however, it is a fact that such disasters still continue to occur. According to the report made on the Orenda mine explosion of Aug. 31, 1915, the gas was ignited by a spark, in the operation of an electric haulage motor. It would seem that if proper precautions had been adopted in this mine, the ignition of the gas and the resulting explosion would not have occurred.

In other cases a reckless miner enters an abandoned portion of the mine carrying an open light when he knows the place to be dangerous. Another miner handles his lamp carelessly or tampers with it, and in so doing runs the risk of causing an explosion. In most cases the mine foreman employs a number of firebosses and assistant foremen on whom he must depend for the thorough inspection of the mine before permitting the men to enter for work. If one of these men makes a false report or fails to make a thorough inspection of his district, an accident is liable to happen.

RESPONSIBILITY OF THE MANAGEMENT

Besides the responsibility resting on each miner working in the mine, much depends on the safe management of the mine, especially where explosive gases are being generated in pillar workings where it is often difficult to secure thorough ventilation and avoid the accumulation of explosive gases on the falls. It may even be necessary to sink a drillhole from the surface in order to drain the gas from such places. To avoid accidents, it is important to take every precaution with respect to maintaining safe conditions on the haulage roads, the timbering of working places and the blasting of the coal. Shotfirers must be employed in many cases whose duty it is to inspect every shot before firing the same and to refuse to fire any hole that in their judgment is unsafe.

When these responsibilities are fully realized by miners and operators, the number of mine accidents will be greatly reduced.

JOHN MAJER.

Listie, Penn.

Study Course in Coal Mining

BY J. T. BEARD

The Coal Age Pocket Book

METRIC SYSTEM OF WEIGHTS AND MEASURES

The units of the metric system are the **gram, meter** and **liter.** The system, unlike that of the United States and Great Britain is wholly a **decimal system** and, for that reason, is more convenient for use.

Denominations—The higher denominations of weight, length and capacity are obtained by multiplying each respective unit by 10. 100, 1000, etc., while lower denominations than the unit are likewise obtained by dividing the same by 10, 100 or 1000.

The denominations of the metric system are expressed by the Latin and Greek prefixes, the former being used to indicate divisions of the unit, while the latter are employed to express multiples of the same unit. These prefixes and their respective values are as follows:

Milli,	1/1000	1 milligram (mg.)	= 0.001	gram
Centi,	1/100	1 centigram (cg.)	= 0.01	gram
Deci,	1/10	1 decigram (dg.)	= 0.1	gram
		Unit of Weight	**1**	**gram**
Deca,	10	1 decagram	= 10	grams
Hecto,	100	1 hectogram	= 100	grams
Kilo,	1000	1 kilogram (kg)	= 1000	grams
Myria,	10,000	1 myriagram	= 10,000	grams

The same prefixes are used to express similar divisions and multiples of the units of length and capacity. Area and volume are expressed by the words square and cubic preceding the same denominations of length. Following are the tables of the metric system and equivalents:

METRIC WEIGHT

10 milligrams	= 1 centigram	0.15432356	gr. (troy)
10 centigrams	= 1 decigram	1.54323564	gr.
10 decigrams	= 1 **gram**	15.43235639	gr.
		0.03527396	oz.(avdp.)
10 grams	= 1 decagram	0.35273957	oz.
10 decagrams	= 1 hectogram	3.52739575	oz.
10 hectograms	= 1 kilogram	35.27395746	oz.
		2.20462234	lb.
10 kilograms	= 1 myriagram	22.04622341	lb.
		0.22046223	cwt.
10 myriagrams	= 1 quintal	2.20462234	cwt.
10 quintals	= 1 tonne	1.10231117	tons

The French tonne (2204.6 lb.) differs but slightly from the British long ton (2240 lb.).

METRIC LENGTH

10 millimeters	= 1 centimeter	0.3937	inches
10 centimeters	= 1 decimeter	3.937	inches
10 decimeters	= 1 **meter**	39.37	inches
		3.2808	feet
10 meters	= 1 decameter	32.8083	feet
10 decameters	= 1 hectometer	328.0833	feet
		0.0621	miles
10 hectometers	= 1 kilometer	0.6214	miles

The Coal Age Pocket Book

The Austrian, Prussian, Danish and Norwegian mile is equal to about 4.7 American miles; the Swedish, to about 6⅔ American miles; while the Russian "verst" is 3500 ft.

METRIC AREA

100 sq. millimeters	= 1 sq. centimeter	0.155	sq.in.
100 sq. centimeters	= 1 sq. decimeter	15.500	sq.in.
100 sq. decimeters	= 1 **sq. meter (centare)**	1549.997	sq.in.
		10.764	sq.ft.
100 centares	= 1 sq. decameter (are)	1076.387	sq.ft.
		0.025	acres
100 ares	= 1 sq. hectometer (hectare)	2.471	acres
100 hectares	= 1 sq. kilometer	247.104	acres
		0.386	sq.mi.
100 sq. kilometers	= 1 sq. myriameter	38.610	sq.mi.

The unit of area is the square meter or centare.

METRIC VOLUME

1000 cu. millimeters	= 1 cu. centimeter	0.061	cu.in.
1000 cu. centimeters	= 1 cu. decimeter	61.023	cu.in.
1000 cu. decimeters	= 1 cu. meter	35.314	cu.ft.
		1.308	cu.yd.

The weight of 1 cu. centimeter of distilled water at maximum density (4° C.), weighed in a vacuum, is 1 gram; or 1 cu. decimeter of same under like conditions is 1 kilogram.

METRIC CAPACITY

10 milliliters	= 1 centiliter	0.610	cu.in.
10 centiliters	= 1 deciliter	6.102	cu.in.
10 deciliters	= 1 **liter**	61.023	cu.in.
		0.035	cu.ft.
10 liters	= 1 decaliter (centistere)	0.353	cu.ft.
10 centisteres	= 1 hectoliter (decistere)	3.531	cu.ft.
10 decisteres	= 1 kiloliter (stere)	35.314	cu.ft.
10 steres	= 1 myrialiter (decastere)	353.145	cu.ft

The liter is the unit of capacity in the metric system. Its volume is 1000 cu. centimeters or 1 cu. decimeter. It contains 61.02338189 cu.in., or 0.26417 gal. (winchester). Or a single winchester gallon contains 3.785434 liters.

The Fluid Ounce—What is known as the "fluid ounce" is a quantity of any liquid equal to that of pure water at maximum density (4° C.) and weighing exactly 1 oz. avoirdupois. The volume of the fluid ounce is calculated as follows:

1 cubic centimeter of water (4° C.) = 1 gram.
1 ounce avoirdupois = 437.5 grains.
1 gram = 15.43236 grains.

Hence, since the volume of 1 gram (water) is 1 c.c. and the fluid ounce has a volume based similarly on the avoirdupois ounce, the value of the fluid ounce is

$$\text{Fluid ounce (fl.oz.)}, \quad \frac{437.5}{15.43236} = 28.3495 \, c.c.$$

The **minim** (a drop), the smallest liquid measure, is $^1/_{60}$ of a fluid dram or the equivalent in volume of 1 grain, which is 1 ÷ 15.43236 = 0.0648 c.c.; or 28.3495 ÷ 437.5 = 0.0648 c.c.

Inquiries of General Interest

Engine-Plane Haulage

Will you kindly explain the method of solving a problem pertaining to rope haulage on an incline? The question is as follows:

On a slope pitching 25 deg. and 2,000 ft. long, a trip of eight loaded cars is to be hoisted in 5 min. The weight of the empty cars is 1,500 lb. each and the average capacity 3,500 lb. of coal. What is the actual horsepower of the engine required to haul this loaded trip up the incline, and what size of plow-steel rope will be required in this case, using 5 as a factor of safety? D. J. Bowen.

Lafayette, Colo.

Assuming an engine-plane haulage in which the loaded cars are hauled up the slope, without being counterbalanced by the weight of the descending empty cars, the total load on the winding drum is the combined gravity pull of the loaded cars and the rope, plus the friction pull of the entire moving load, including the rope.

Under fair average conditions in mining practice it is safe to estimate on a track resistance of 40 lb. per ton on a level road. The corresponding track resistance when hauling on an inclination of 25 deg. is $40 \times \cos 25^\circ = 40 \times 0.9 = 36$ lb. per ton. To this must be added the gravity pull per ton due to the inclination. There being 2,000 lb. in a ton, the gravity pull in this case is $2{,}000 \times \sin 25^\circ = 2{,}000 \times 0.4226 =$ say 845 lb. per ton. Therefore in this case the total load on the engine is $845 + 36 = 881$ lb. per ton of moving load, including the rope.

The weight of the loaded trip is $8\ (1{,}500 + 3{,}500) = 40{,}000$ lb., or 20 tons. Then allowing, say, an extra ton for the weight of the rope, for the purpose of estimating the size of rope required, gives a total approximate moving load of 21 tons. The load on the rope at the drum, due to the combined track resistance and gravity pull, is then $881 \times 21 \div 2{,}000 = 9.25$ tons. Now, calling the diameter of the rope d (inches) and the load on the rope L (tons), and using a factor of safety $f = 5$, since the breaking load of a 1-in. six-strand seven-wire plow-steel haulage rope is 42 tons, we have

$$d = \sqrt{\frac{fL}{42}} = \sqrt{\frac{5 \times 9.25}{42}} = 1.05,\ say\ 1\tfrac{1}{8}\ in.$$

This rope weighs 2 lb. per ft., as taken from wire-rope tables, which makes the total weight of the rope on this incline $2{,}000 \times 2 = 4{,}000$ lb., or 2 tons. The total moving load is therefore 22 tons, which makes the load on the rope at the drum $22 \times 881 \div 2{,}000 = 9.69$ tons.

Reversing the previous formula, to find the safe load on a 1⅛-in. plow-steel haulage rope, using a factor of safety $f = 5$, we have

$$L = \frac{42\,d^2}{f} = \frac{42\,(1\tfrac{1}{8})^2}{5} = 10.63\ tons$$

which shows that this rope is amply safe to haul the required load.

The horsepower of the engine required for this hoist is estimated from the load on the engine and the speed of winding. To haul the trip a distance of 2,000 ft. in 5 min. will require a speed of winding $2{,}000 \div 5 = 400$ ft. per min. The required horsepower of the engine, assuming an efficiency of 85 per cent., is therefore

$$H = \frac{9.69 \times 2{,}000 \times 400}{0.85 \times 33{,}000} = 276 + hp.$$

In this calculation, no allowance is made for time lost in starting and stopping the trip. The time of acceleration and deceleration of the loaded trip will depend on the load on the engine and the speed to be attained.

Friction Hoist for Engine Plane

We are installing in our plant a 40-hp. friction hoist to pull a 5-ton loaded car up a 30-deg. incline at a speed of 200 ft. per min. The hoist consists of a 36-in. drum bolted to the spokes of an iron wheel 80 in. in diameter and having a 10-in. face. This wheel and drum are driven by a paper friction pinion 12 in. in diameter, with 10-in. face. This pinion is forced against the driving wheel of the drum with a pressure sufficient to give the desired friction and enable it to transmit the 40 hp. of the engine to the drum. We estimate that the required speed of the drum, which is 3 ft. in diameter, is $200 \div (3 \times 3.1416) =$ say 21 r.p.m. There is, however, considerable difference of opinion as to what speed it will be necessary to run the 12-in. pinion in order to operate the drum at the required speed.

Peoria, Ill. Charles F. Sherman.

It is not customary to employ a friction drive of this type for hoisting on an incline or for the transmission of as high a power as is required in this case.

Assuming a track resistance on the level of 40 lb. per ton gives for the same item on an incline of 30 deg. $40 \times \cos 30$ deg. $= 40 \times 0.866 = 34.6$ lb. per ton. Adding this track resistance to the gravity pull of a 5-ton load on this incline gives 1,034.6 lb. per ton as the total load on the drum. Correspondent does not mention the length of the incline, but a ¾-in. plow-steel rope weighing 0.89 lb. per ft. would be required for this haul, and this may be assumed to add from ¼ to ½ ton, making the load hoisted, say, 5.5 tons. The total load on the drum is then $1{,}034.6 \times 5.5 = 5{,}690$ lb.

The diameter of the large wheel being 80 in. and that of the drum 36 in., the load at the circumference of the large wheel is $5{,}690 \times 36 \div 80 = 2{,}560$ lb. Assuming a coefficient of friction between the two wheels as 0.25, it would be necessary to exert a pressure of about 5 tons in forcing the pinion against the face of the large wheel in order to hold this load and prevent slipping of the pinion. We cannot recommend this type of hoist, but assuming there is no slip in the friction drive, the pinion should be run at a speed of $21 \times 80 \div 12 = 140$ r.p.m.

Examination Questions

West Virginia Examination for Mine Foremen, Oct. 26-28

(*Selected Questions*)

Ques.—What particular dangers are there in pillar drawing and what, in your opinion, should be done to prevent accidents in the performance of this work?

Ans.—When drawing pillars, the miner is working what is called a "loose end." He is particularly subject to danger from falling slate, owing to the weak support of the roof afforded by the ends of the pillars. There is also in many cases the added danger of the accumulation of gas on the falls, which may at any moment be driven down on the lamps of the miners by a slight fall of slate above.

In order to avoid accidents from the first cause, the miner should not neglect the setting of sufficient timbers behind and around him to give an added support to the roof and prevent the crushing of the end of the pillar. As far as possible, the miner should work on the rib of the pillar or in a protected position. He should watch constantly the timbers and note the action of the roof, giving particular attention to any slips that may appear in the roof slate. It is important that the miner should keep the way clear of all obstructions so that he can retreat quickly to a place of safety on the first indication of danger.

When drawing pillars in a place where gas may be generated, special care should be taken to avoid heavy local falls of roof that would furnish holes for the accumulation of gas. By maintaining a regular line of pillar work, much can be done to induce a gradual and uniform settlement of the roof along this line as the pillars are drawn back. By this means and by maintaining a sufficient current of air so conducted as to sweep the falls, any dangerous accumulation of gas can be generally avoided. Under such conditions, only safety lamps should be used by the miners when drawing pillars, and these must be carefully watched to observe any increase in the quantity of gas present. The lamps should be put in a safe position where they will be protected from injury owing to falls of roof, which are more liable to occur in pillar work than when driving rooms or headings.

Ques.—What should be considered in determining the size of pillars in mines?

Ans.—The depth, thickness and inclination of the seam; the character of the roof, coal and floor; the system of mining or plan of driving rooms and entries; length and width of the rooms and other openings; method adopted for mining the coal; and, finally, the possibility of extended periods of idleness in the working of the mine. These should all be considered as factors in determining the size of pillars required for the safe and economical working of the coal and to secure the largest recovery of the same.

Ques.—What conditions would guide you in determining the width of headings and rooms?

Ans.—The depth, thickness and inclination of the seam; the direction of driving the rooms with respect to the cleats or cleavages of the coal; the nature of the roof and floor of the seam; the method of mining adopted or the general plan of the workings; the method of mining and loading the coal at the face; and, what is very important in economical mining, the amount of waste to be handled and the length of time the rooms may have to stand idle.

Ques.—In your opinion, would a good system of timbering prevent accidents?

Ans.—A good system of timbering that is well adapted to the particular conditions existing at the working face will go far to prevent the frequent occurrence of accidents due to falls of roof and coal. In general, especially when working under a frail roof or where frequent slips occur in the roof, a systematic plan of timbering is important, and this should be maintained uniformly as the faces advance. The practice of setting timbers when and where the judgment of the average miner may dictate is responsible for many accidents caused by falls of roof and coal at the working face. Such practice should be abandoned and a proper system of timbering adopted in all mines.

Ques.—In a room with a fair roof, how far apart would you place the timbers?

Ans.—The distance of post timber, center to center, will depend largely on the nature of the roof, amount of roof pressure and the thickness and inclination of the seam. To some extent, the distance of posts apart will depend on the kind and size of timber used. Under fair conditions of roof and floor, in a moderate thickness of seam and small inclination or pitch, post timbers should be set from 3 to 4 ft. apart. Under better conditions than those named, this distance can be increased to 6 or 8 ft. apart. It is a good plan to stagger the timbers in each alternate row, so that the posts in succeeding rows will not stand behind each other.

Ques.—Where the roof is bad, how should the timbers be placed?

Ans.—When working under a frail or tender roof, post timbers should not be set more than 3 ft. apart, center to center. Good cap-pieces should be used above each post, and these should not be less than 1½ or 2 in. thick, 6 in. wide and 18 in. long. It may be necessary to use crossbars instead of cap-pieces to give a better support to the roof between the timbers. These crossbars should be parallel to the line of the working face. If the bottom is soft, foot boards should be used underneath the posts.

Ques.—Under what conditions do you consider coal dust dangerous in mines?

Ans.—The fine dust of a highly inflammable coal is dangerous under any conditions in mines. When gas is present in the mine air even in quantity too small to be detected by the safety lamp or where blasting is performed the danger owing to the presence of the dust is greatly increased unless special precautions are taken.

Coal and Coke News

Washington, D. C.

The Federal Reserve Board in its November Bulletin just published furnishes, in the Reports of Business Conditions from the several districts, some interesting comment on coal mining. The reserve agent at Philadelphia writes that "Coal-mining operations continue to improve," while from Cleveland it is stated that "the soft-coal business and coke industry is much more satisfactory, and it is nearly a sellers' market for the first time in several years." From Richmond it is reported that "Coal is in good position and its great tonnage is materially helping the railroads in caring for this territory."

An interesting report as to the position of the petroleum industry also comes from California, the reserve agent there writing as follows:

> Petroleum is one of the leading industries in this district, with a present annual production of approximately 100,000,000 barrels. This general condition would seem to assure a most favorable situation, but as a matter of fact this industry has been greatly depressed during the past few years and shows no present prospect for betterment. The production, approximating 250,000 barrels per day, about balances with current consumption, but approximately 60,000,000 barrels are in storage and there is a considerable "shut-in" production; that is, wells whose output would be immediately available if desired.
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> Some financially strong and ably managed corporations are operating with moderate profit, but many are not operating. Effort is making to consolidate more than 100 of the smaller companies. If accomplished, the industry would be in the hands of several large corporations whose financial strength would give greater stability to the industry while apparently assuring adequate competition.

Two Visiting Commissions

Mining interests in common with others have heard with interest the current official announcement that:

> Two commissions composed of government officials and business men from European countries are expected to reach the United States within the next few days with the primary purpose of arousing interest in the extension of reciprocal commercial relations. A commission of French business men, under the leadership of the secretary of the Budget Committee of the French Chamber of Deputies, is now due in New York with the idea of devoting considerable time to a study of general commercial conditions existing in the United States.
>
> It is expected that the commission will visit the leading cities of the country, not only to study American methods of business, but also to extend the interest of Americans in French products and French markets. While the precise itinerary which the commission will follow is not known at present, the Bureau of Foreign and Domestic Commerce expects to be in possession of such information shortly after the commission's arrival and will then answer inquiries on the subject.
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> A similar commission, representing the Amsterdam Chamber of Commerce, was expected to sail from Amsterdam on Nov. 6, reaching the United States about the middle of the month. No definite information as to the course to be followed by this commission is at present available, but it is understood that the commission contemplates going directly to Washington to confer with representatives of the government and of the Chamber of Commerce of the United States before making further announcement as to its plans.

HARRISBURG, PENN.

The sum of approximately $10,000,000 which has been collected by the coal companies in the anthracite region in preparation for payment to the state as a tax of 2½ per cent. upon all coal mined during 1913, 1914 and up to June 1, of this year, is in a badly muddled condition. This may either revert to the state through escheat proceedings, or may be kept by the coal companies, or still another bare possibility, may be refunded to the consumer who paid it.

As soon as the law went into effect the coal companies considered it necessary to prepare for paying this tax in the event their protest should not be sustained. Some of the companies added the 2½ per cent. to the bills, specifically listing it as the tax item, others less careful in the matter, or more confident of the success of their protest, merely blanketed the tax item by raising the price per ton, thus acquiring the money, but making no provision for refunding it in case it did not become necessary for them to pay it to the state as a tax.

Since then the Supreme Court of the state has declared the tax unconstitutional and now the problem of what is to be done with the money raised, comes up. The money does not belong to the coal companies, it is unconstitutional for the state to accept it as a tax. If the individual consumer has protected himself with receipts he probably can demand a refund of the tax. The sums that cannot be traced to the consumers of coal who paid the tax, will probably be escheatable to the state, such a proceeding has now been instituted and is awaiting the decision of Attorney General Brown.

Probably a majority of consumers cannot produce receipts and where receipts were given they may not bear a definite statement of the amount of the tax. Retailers may argue that the increase in the cost of coal was justified for other reasons than the state tax. In this way endless confusion may hinder any attempt on the part of the consumer to get back his money collected under an unconstitutional law.

It has been suggested that the money be divided among the hospitals in the anthracite region voluntarily by the coal companies. That would relieve the state from making appropriations to such institutions for some years, and the money thus released could be diverted to other purposes. But such voluntary distribution cannot be made until legal proceedings have been disposed of, and then only in the event that the money is left in the hands of the operators.

Final Meeting of Mine Cave Commission

The final meeting of the Anthracite Mine Cave Commission which body formulated a comprehensive and complete report of the big problem of mine caves a short time ago, was held recently and a few incidental matters of finance were discussed. The commission accomplished a deficit during its activities and the Governor has approved an appropriation of about $5,000 to cover this. A committee was organized to close the accounts.

While assembled the members of the commission discussed the general mine cave situation and its various problems. The men spoke of the experiences that have been encountered in the various districts that they represent on the commission. Several reported that the recommendations embodied in the report, relative to purchasing support, responsibility for damaged property, location of cemeteries, and the securing of public buildings against damage were being considered by the mining companies.

The commission's report has been submitted to the Governor and state legislators, but regrets that it has never been made available to mining men and others interested were expressed at the meeting. The report, with all of its tests of roof support, statistics on the amount of coal underground and the percentage that is mineable, discussion of the various methods of dealing with damaged surface property and hundreds of other phases and connected thoughts would no doubt be of interest to all persons interested in mining or in mining communities where the necessity of surface preservation in this regard has become apparent. Steps may be taken to have the report published by asking the next Legislature for an appropriation for this purpose.

PENNSYLVANIA

Anthracite

Shamokin—The discovery of a coal deposit on a farm just outside the limits of the city recently caused considerable excitement among land owners nearby, as the district was supposed to be outside of the coal bearing area.

Wilkes-Barre—Production of anthracite in October fell nearly half a million tons below the production in the corresponding month, of last year. The total output of coal for the first 10 months of the year is now approximately three million tons below that for the first 10 months of 1914. When the official figures are announced by the Anthracite Bureau of Information, it is probable that the tonnage of coal shipped to market last month will be about 6,150,000 tons. In October, 1914 the tonnage was 6,644,476 tons. The shipments for the last two months of 1914 aggregated 11,730,544 tons. As the biggest shipments for any one month so far have been 6,665,321 tons, made in October, 1912, it is obvious that only part of the shortage can be made up.

Pittston—Emphasizing the importance of timbering to the mining industry, the Pittston Mining Institute is devoting all of its Fall meetings to a demonstration of correct methods. Mine Inspector Samuel J. Jennings is conducting the demonstrations, calling into use a carload of mine props. Two sessions of the institute have already been devoted to this topic and wide-spread interest is being caused.

In line with the general plan of the Pennsylvania Coal Co. to substitute electricity for steam as motive power, the old No. 3 shaft, one of the oldest operations in Pittston, has been completely electrified. The shaft has been widened and the sides concreted. For years it has been used only as a ventilating and pumping shaft, but with remining under the city in progress, a new tower and cages have been installed. The shaft is in the central city, a stone's throw from City Hall. There had been complaint on the noise of the steam plant. The electrically-driven apparatus will be noiseless.

Bituminous

Confluence—It is reported that Philadelphia capitalists have closed a deal for the purchase of a tract of coal land in Henry Clay Township. It is said that this tract will be developed, and visions of a coal town springing up are entertained by the residents of that vicinity.

Gray's Landing—It is said that within a short time every oven at the Gray's Landing works of the American-Connellsville Coal and Coke Co. will be in operation. Two hundred and forty ovens at this plant have been idle since the Sunshine Coal and Coke Co. went to the wall. Operations will be resumed in full within a short time if enough men can be found to operate the plant.

Connellsville—The production of coke in the Connellsville region recently rose to 433,519 tons, showing a gain of 4,200 tons over the preceding week. Shipments during the same time amounted to 441,911 tons, which filled 11,968 cars.

VIRGINIA

Abingdon—The increasing demand for laborers in the southwestern Virginia field is being well met, according to reports received here. Special activity in Wise and Lee counties is reported and laborers are being recruited in numbers throughout the South.

WEST VIRGINIA

Charleston—It is said that West Virginia coal operators are facing the greatest car shortage that has affected the shipping trade within four or five years. Railroad men state repairs to cars and the purchase of new rolling stock have been at a standstill for some years on account of the low tariffs enforced by the Interstate Commerce Commission, and that sufficient time has not been had since the lifting of the Federal ban to enable the companies to put on sufficient cars to take care of the present heavy demand.

It is expected that a state association of coal company accountants will be organized within a few weeks. It is hoped by the West Virginia operators that through the installation of a uniform system of computing cost of production they will be enabled to save considerable expense each year. It is the intention to install such a system of keeping cost accounts.

The controversy between the Public Service Commission and the United States Coal and Coke Co. over the desire of the latter to withdraw from participation in the benefits of the workmen's compensation fund, was recently ended when the company paid $15,200, calculated by the commission as owed by the company as its share of the deficit. Upon the receipt of the check the commission formally accepted the withdrawal and the company's election to assume its own responsibility for claims due its employees for accidents and fatalities.

Fairmont—Traffic over local railroads destined to the Great Lakes will be discontinued after Nov. 15, according to a report received recently at the local railroad offices. It is the intention of the navigation companies on the lakes to hold the season open till a later date this year on account of many manufacturing concerns in the Northwest not being able to lay in a large supply of fuel. The navigation companies, however, consider that the passage of boats is too dangerous after the above named date, and will officially declare the shipping season closed on Nov. 15.

TENNESSEE

Knoxville—The next examination for mine foremen in all classes of mines, including both coal and metal mines, and for fire bosses will be held in the Atkins Hotel, Knoxville, Tenn., Nov. 23, 24 and 25, 1915. This examination will be both practical and technical.

KENTUCKY

Whitesburg—The Allegheny Coal and Coke Co., at Lookout, has fired an additional 100 coke ovens. This is the only company in the Big Sandy section which cokes its product.

Barbourville—Many of the mines in this section are working night shifts, in contrast with the situation here early in the year when few of the mines were operating more than two or three days during the week. A full run throughout the winter is expected by the trade.

Hartford—The commissary of the Williams Coal Co., at the Williams mines near here, has been destroyed by fire, together with the stock and the residence of Guy Stateler, manager of the store. Mr. Stateler's garage and other buildings also were destroyed.

OHIO

Barton—The Barton Coal Co. is constructing a bridge over the St. Clairsville branch of the Baltimore & Ohio R.R. for the purpose of making another opening in the hill and loading from both openings over one tipple. The improvement will increase the output of the mine.

Senecaville—The Cleveland mine of the Morris Coal Co., which has been idle since Aug. 1 has been re-opened with approximately 200 miners.

ILLINOIS

Belleville—The Royal coal mine, on the Louisville & Nashville R.R., after being closed more than two years, resumed operations recently. It will be operated only part time the rest of the year.

The Pittsburg Mining Co. has filed suit in the Circuit Court against the Fischer Coal and Ice Co., Fred and George Gramlich and Alfred Rodenmeyer to recover $1,000 said to be due on a note.

Mt. Vernon—All the miners employed in Mine No. 1 of the Big Creek Coal Co. were on strike two days recently on account of the discharge of three pit bosses. After a conference with the company officials the miners returned to work, pending reference of the dispute to the president of the United Mine Workers of the district.

Lenzburg—Walter J. Grant, of Danville, referee in bankruptcy for the Federal Court of this district, opened bids a few days ago for the mine of the Tirre Coal and Mining Co., of this place, against which bankruptcy proceedings are pending. The only bid submitted was $2,000 and was rejected. Referee Grant ordered a public sale of the property on the courthouse steps in Belleville, Ill., on Nov. 20. The sale will be conducted by P. B. Cheeney of East St. Louis, who was appointed trustee by the creditors. The company's assets are listed at $12,500 and the liabilities at $11,000. The company was thrown into bankruptcy in August on the petition of Mrs. Mollie E. Tirre and F. E. Tirre, of St. Louis and William F. Zager, of Lenzburg. Mrs. Tirre alleges that she loaned the company $14,441 and F. E. Tirre says the company owes him $1,680 salary.

MISSOURI

Kirksville—J. C. Ward, who has been president and general manager of the Big Creek Coal Co. since Mar. 23, has sold his interests in the company to the other shareholders and will devote himself to the development of his own coal properties. G. W. Hartsock, of Albia, Iowa, has been elected president of the Big Creek company and Treasurer J. R. Brown will take over the duties of general manager. William Richardson remains secretary. The company's development work will be continued.

COLORADO

Denver—As a means of communication between the management and the employees and the public the Colorado Fuel and Iron Co. has issued the first quarterly number of the "Industrial Bulletin." This is published under the direction of C. J. Hicks, executive assistant to Pres. J. F. Welborn. The "Bulletin" gives a full statement of the industrial plan drafted by John D. Rockefeller, Jr., during his recent visit and which had been adopted by the miners in all of the company camps in Colorado and Wyoming. It is illustrated and contains much matter of interest and value to the employees.

FOREIGN NEWS

Toronto, Canada—Thomas Richardson, labor member of the British House of Commons for Whitehaven, and Robert Baird, secretary of the Coal Mine Owners' Association of Lanarkshire, Scotland, were in Toronto recently on their return journey from British Columbia, where they have been engaging coal miners to work in the British collieries. They have secured 260 men, 40 of whom take their families with them. The British Government advances their fare to England to be repaid by instalments from their wages. The pay for mining work in the Old Country at present is about $4 per day and in some cases more.

PERSONALS

Captain F. A. Hill, well known mining engineer of Seattle, Wash., has recently been on a professional visit in California examining the mother lode.

Frank H. Crockard, of Birmingham, Ala., vice-president of the Tennessee Coal, Iron & R.R. Co., is spending a few weeks in Atlantic City, N. J., recovering from a nervous breakdown.

Daniel R. Blower, state mine inspector for the 11th Bituminous District of Pennsylvania, has accepted the position of mine inspector for the Vesta Coal Co., with headquarters at California, Penn.

W. G. Thomas, for many years with the Madeira-Hill Coal Co., recently succeeded to the general managership of the Madeira-Hill operations in the anthracite region upon the death of Frank A. Hill.

Walter E. Auld has been appointed sales agent of W. A. Stone & Co., with office in Buffalo. He has for several years been connected with the Buffalo office of the Delaware, Lackawanna & Western Coal Co.

Andrew Calderwood, for many years general mine foreman for the Campbell Creek Coal Co. of West Virginia, has been appointed district mine inspector to succeed the late Enoch Carver in the seventh district.

R. R. Bunnell who represented the Skeele Coal Co. of New York in New England has resigned and will hereafter be identified with the Seiler-Blanchard Coal Co. of New York, with offices in the Kelsey Building, Springfield, Mass.

D. A. Thomas, the commissioner of munitions, who was sent to this country and Canada by Lloyd George to look after all contracts made for the British Government, recently underwent two operations in a private sanitarium in New York.

Ivor Livingston, of New York, has been employed as superintendent by the First Creek Coal Co., at its mines near Hazard, Ky. Mr. Livingston is one of the leading mining engineers in the South and is a graduate of the University of Tennessee.

Glenn A. Knox, of Fontier, Wyo., recently accepted the superintendency of the mines of the Standard Coal Co. at Standardville, Utah. These mines are located about six miles above Helper and have a capacity of approximately 1,000 tons per day.

Eli T. Conner, consulting engineer to the Delaware & Hudson Co. and to the Hudson Coal Co., has occupied offices in the new Union National Bank Building, Scranton, Penn. He will continue his principal office at 1315 Stephen Girard Building, Philadelphia, Penn.

C. S. Oldroyd, 922 Holston National Bank Building, Knoxville, Tenn., representing the Manierre box car loader and the Plymouth gasoline locomotive, has also taken the agency for the Halby shoveling machine, manufactured by the Lake Shore Engine Works, Marquette, Mich., representing this firm in the states of Tennessee, Kentucky, Virginia, West Virginia and Alabama.

Warren R. Roberts, president, and Edward E. Barrett, vice-president, of the Roberts & Schaefer Co., Chicago, have just returned from Canada where they signed a contract with a large coal company for the design and construction of an electrically operated anthracite coal dock bridge and storage plant. This will be one of the most modern installations of its kind in the country.

OBITUARY

Winfield Scott Solomon, for the past 16 years connected with the Lehigh Valley Coal Co. as general boiler inspector and superintendent of boiler plants at its various collieries in Luzerne, Lackawanna and Schuylkill Counties, died recently at Wilkes-Barre.

W. H. Johnson, of Birmingham, Ala., traffic manager for the Southern District of the Republic Iron and Steel Co., which position he has held for many years, died recently at his residence, 1113 Twelfth Avenue, South,, of tuberculosis. Mr. Johnson was 44 years old at the time of his death.

PUBLICATIONS RECEIVED

Rhode Island Coal.. By George H. Ashley, U. S. Geol. Surv. Bulletin 615; illustrated; 59 pp., 6x9 in.

The Production of Peat in 1914. By Chas. A. Davis. U. S. Geol. Surv.; unillustrated; 10 pp., 6x9 in.

Production of Feldspar in 1914. By Frank J. Katz. U. S. Geol. Surv.; unillustrated; 5 pp., 6x9 in.

The Manufacture of Coke in 1914. By C. E. Lesher. U. S. Geol. Surv.; unillustrated; 55 pp., 6x9 in.

The Production of Lime in 1914. By G. H. Loughlin. U. S. Geol. Surv.; unillustrated; 10 pp., 6x9 in.

Gems and Precious Stones in 1914. By Douglas B. Starrett. U. S. Geol. Surv.; unillustrated; 40 pp., 6x9 in.

The Production of Silica (Quartz) in 1914. By Frank J. Katz, U. S. Geol. Surv.; unillustrated; 5 pp., 6x9 in.

The Production of Abrasive Material in 1914. By Frank J. Katz. U. S. Geol. Surv.; unillustrated; 19 pp., 6x9 in.

Safety in Stone Quarrying. By Oliver Bowles. Bureau of Mines Technical Paper 111; illustrated; 48 pp., 6x9 in.

Quicksilver in 1914; Production and Resources. By H. D. McCaskey. U. S. Geol. Surv.; unillustrated; 18 pp., 6x9 in.

The Production of Platinum and Allied Metals in 1914. By Jas. M. Hill. U. S. Geol. Surv.; unillustrated; 20 pp., 6x9 in.

The Phosphate Deposits of Florida. By Geo. C. Matson. U. S. Geol. Surv. Bulletin No. 604; illustrated; 101 pp., 6x9 in.

The Production of Magnesite in 1914. By Charles G. Yale and Hoyt S. Gale. U. S. Geol. Surv.; illustrated; 17 pp., 6x9 in.

Quicksilver Deposits of the Mozatzal Range, Arizona. By F. L. Ransome. U. S. Geol. Surv. Bulletin 620-F; illustrated; 18 pp., 6x9 in.

Possibilities of Oil in the Porcupine Dome, Rosebud County, Montana. By C. S. Bowen, U. S. Geol. Surv. Bulletin 621-F; illustrated; 9 pp., 6x9 in.

Iron Ore in Cass, Marion, Morris and Cherokee Counties, Texas. By E. F. Burchard. U. S. Geol. Surv. Bulletin 620-G; illustrated; 40 pp., 6x9 in.

The Production of Asphalt, Related Bitumens and Bituminous Rock in 1914. By John P. Northrop. U. S. Geol. Surv.; unillustrated; 15 pp., 6x9 in.

Statistics of the Clay-Working Industries in the United States in 1914. By Jefferson Middleton. U. S. Geol. Surv.; unillustrated; 92 pp., 6x9 in.

The Orofino Coal Field, Clearwater, Lewis and Idaho Counties, Idaho. By Chas. T. Lupton. U. S. Geol. Surv. Bulletin 621-I; illustrated; 9 pp., 6x9 in.

A Reconnaisance for Oil Near Quanah, Hardman County, Tex. By Carroll H. Wegemann. U. S. Geol. Surv. Bulletin 621-J; illustrated; 6 pp., 6x9 in.

Anticlines in the Clinton Sands Near Wooster, Wayne County, Ohio. By C. A. Bonine. U. S. Geol. Surv. Bulletin 621-H; illustrated; 11 pp., 6x9 in.

The Lawton Oil and Gas Field, Oklahoma. By Carroll H. Wegemann and Ralph W. Howell. U. S. Geol. Surv. Bulletin 621-G; illustrated; 14 pp., 6x9 in.

Monthly Statement of Coal-Mine Fatalities in the United States, August, 1915. Compiled by Albert H. Fay. Bureau of Mines; unillustrated; 15 pp., 6x9 in.

Gold, Silver, Copper, Lead and Zinc in California and Oregon in 1914; Mines Report. By Charles G. Yale. U. S. Geol. Surv.; unillustrated; 16 pp., 6x9 in.

Gold, Silver, Copper and Lead in South Dakota and Wyoming in 1914. Mines Report. By Chas. W. Henderson. U. S. Geol. Surv.; unillustrated; 18 pp., 6x9 in.

Iron-Bearing Deposits in Bossier, Caddo and Webster Parishes, Louisiana. By E. F. Burchard. U. S. Geol. Surv. Bulletin 620-G; illustrated; 21 pp., 6x9 in.

Mineral Resources of Alaska. Report on Progress of Investigations in 1914. By Alfred H. Brooks and others. U. S. Geol. Surv. Bulletin 622; illustrated; 380 pp., 6x9 in.

Abstract of Current Decisions on Mines and Mining, October, 1914, to April, 1915. By J. W. Thompson. Bureau of Mines Bulletin 101, Law Serial 5; unillustrated; 138 pp., 6x9 in.

Inflammability of Mixtures of Gasoline Vapor and Air. By G. A. Burrell and H. T. Boyd. Bureau of Mines Technical Paper 115, Petroleum Technology 26; illustrated; 18 pp., 6x9 in.

Application of the Theory of These Squares to the Adjustment of Triangulation. By Arthur S. Adams, Coast & Geod. Surv. Serial No. 9, Special Publication No. 28; illustrated; 220 pp., 6x9 in.

Geology and Oil Resources of the West Border of the San Joaquin Valley, North of Coalinga, Calif. By Robert Anderson and Robert W. Pack. U. S. Geol. Surv. Bulletin 603; illustrated; 220 pp., 6x9 in.

Analysis of Natural Gas and Illuminating Gas by Fractional Distillation at Low Temperatures and Pressures. By G. A. Burrows, M. Sievert and I. W. Robertson. Bureau of Mines Technical Paper 104; illustrated; 41 pp., 6x9 in.

Pulmonary Diseases Among Miners in the Joplin District, Mo., and Its Relation to Rock Dust in the Mines. A preliminary report by A. J. Lanza and Edwin Higgins. Bureau of Mines Technical Paper 105; illustrated; 48 pp., 6x9 in.

INDUSTRIAL NEWS

Louisville, Ky.—Western Kentucky coal operators have requested the Kentucky State Railroad Commission to intercede in their behalf with the Interstate Commerce Commision.

Youngstown, Ohio—The La Belle Iron Works has just issued $2,000,000 worth of bonds, with which to finance a battery of 94 coke ovens which it recently erected at its plant.

Philadelphia, Penn.—The Stonega Coal and Coke Co. has increased the facilities of its tidewater service by the purchase of the coal-carrying vessels "Raymond McNally" and "Dorothy."

Hazard, Ky.—The First Creek Coal Co. recently awarded the contract to the Fairmont Mining Machinery Co. for a rope and button retarding conveyor for the coal company's new development at Hazard.

Washington, D. C.—The Interstate Commerce Commission has refused the request of the Delaware, Lackawanna & Western R.R. to increase the rates of freight on anthracite shipments 25c. a ton from Taylor, Penn., to tidewater.

St. Louis, Mo.—The Livingston mine of the Rudledge & Taylor Coal Co., located in central Illinois on the Chicago and Eastern Illinois, and Big Four railroads, recently broke its previous record by loading 4,888 tons of coal in eight hours.

Uniontown, Penn.—A shipment of 7,000 tons of coke for the Italian State Railways was recently made. This is the first cargo of coke to be exported to Italy in many years, and freight charges will be about three times the original cost of the coke.

Cincinnati, Ohio—Suit has been filed by the Western German Bank, of this city, against Edwin Marmet, of the Marmet Coal Co., on a note for $27,500, secured by stock. There has been no default in the payment of interest on the note, but the bank desires to enforce payment.

Charleston, W. Va.—Each of the West Virginia representatives in Congress has been asked to introduce an investigation into what the coal operators of the state term "an illegal combination of railroads, operators and coal miners of other states to destroy the coal industry of West Virginia."

Birmingham, Ala.—One thousand tons of coke is being loaded as fast as cars can be furnished to the Yolande Coal and Coke Co. This will be shipped to New Orleans for export. A good price was obtained for this coke and it is believed in industrial circles that this is the forerunner of an extensive coke export business.

Philadelphia, Penn.—For the month of September the gross receipts of the Philadelphia & Reading Coal and Iron Co. showed a loss of $672,092 as compared with the same month last year. The total deficit in net earnings for the three months ending with September amounts to $228,962, with a deficit in surplus for the same period of $252,962.

Philadelphia, Penn.—In its monthly statement of car movement the Pensylvania R.R. reports that 57,027 cars of bituminous coal were moved eastward during the month of October, being an increase of 14,503 over September, or 34.4 per cent. During the same period 4,189 cars of coke were moved in the same direction, being an increase of 1,676, or 66.7 per cent.

Whitesburg, Ky.—Coal operators in the Kentucky River district comprising the Hazard, Boone's Fork and Elkhorn fields are experiencing no difficulty in getting ample cars and everything is booming in all the coal mining plants hereabouts. Some of the mines are having a little trouble in holding miners, especially foreigners, owing to the progress of the European war.

Philadelphia, Penn.—Notice has been received by local shippers of bituminous coal that the new tariffs increasing the differential on West Virginia coal to Western points by 15c. will be filed with the Interstate Commerce Commission on Nov. 15 by the Baltimore & Ohio, Chesapeake & Ohio and Norfolk & Western railroads. This will make the new rates effective as of Dec. 15.

Cleveland—The Youghiogheny and Ohio Coal Co. recently awarded a contract to the Fairmont Mining Machinery Co. for changing the method of weighing coal to the run-of-mine basis at the Florence mine. A center dump basket with operating mechanism, scale, and continuous apron feeder for elevating the coal from basket dump hopper to the screening equipment will be installed.

Issaquah, Wash.—The Issaquah & Superior Coal Co. mine at Issaquah, Wash., will be reopened and put on a producing basis at once. The mine has been leased by Pennsylvania capitalists. The mine was closed down on account of financial difficulties and the new operators take over a burden of $8,000 in back wages to the miners. This will be repaid at the rate of a royalty of 15c. per ton.

St. Louis, Mo.—The Williams Patent Crusher and Pulverizer Co. is urging its customers to send in lists of needed repairs to their crushers as early as possible, as extreme difficulty is being experienced in procuring iron and steel with which to build crusher parts. It is believed by the Williams company that the difficulty in securing iron will increase rather than diminish.

Philadelphia, Penn.—The New York Shipbuilding Co., of Camden, has received the contract and has commenced the construction of a 12,500-ton collier for the Darrow-Mann Co., of Boston, Mass. On the completion of this vessel the company will build another of similar capacity and both boats will be placed in the coastwise coal trade under the management of the Coastwise Transportation Co.

Edwardsville, Ill.—A coal man should not be compelled to serve on the grand jury during his busy season, in the opinion of Judge J. Frank Gillham of the Madison County Circuit Court. He recently excused Charles W. Huskinson, an Alton coal dealer, on that ground. Huskinson was called on the jury but when he told the Judge it was his best season for making some money he was told to go about his business.

Amherstdale, W. Va.—The Fairmont Mining Machinery Co. recently received a contract from the Prockter Coal Co. for a complete equipment of its new development. This will consist of a dump, hopper, feeder, apron conveyor, three-track shaker, screen equipment, including two picking tables, and loading booms with refuse and mixing conveyors. When completed this will be a modern plant, with a capacity of 2,000 tons per day.

Harrisburg, Penn.—It has been announced by officers of the Gamble Fuel Briquette Co. that ground has been broken for the erection of a plant to turn out some 20,000 to 25,000 tons of specially prepared fuel per year. It is believed that operations will be begun early next year, and it is announced that the briquettes will be free from coal tar pitch which has been the smoke producing constituent of most of the coal briquettes heretofore manufactured.

Bessemer, Ala.—The Woodward Iron Co. has decided to open another coal mine in order to secure a larger supply of coal for its furnaces and ovens. It has been decided that a slope should be opened some distance from Dolomite, but striking the same bed of coal and getting a shorter underground haul than the company now has at the former mine. It is understood that this slope will be 600 ft. long and will be equipped in a thoroughly modern manner.

Scranton, Penn.—It has been announced that the Temple Coal Co. has decided to refund to its patrons the coal tax paid by them under the act of 1913, which has been declared unconstitutional. This is the first company to make a definite announcement in this regard. When the law was placed in effect instead of making the tax a separate item on the circular this company added 10c. to the prepared coal sizes and 5c. to pea and smaller and it is on this basis that the refund will be made.

East St. Louis—Traffic officials of east side railroad lines, at a meeting recently, decided to waive collection of the increased rate on coal shipments from Illinois mines to East St. Louis accruing between Feb. 1 and Oct. 1. An increase of 5½c. a ton was allowed, effective Feb. 1, 1915, but was suspended by the Illinois Public Utilities Commission until Oct. 1. It was the conviction of the traffic officials that they had a legal right to enforce collection of the rate from the original date, but to avoid complications and contentions it was decided to make no effort to collect the increase except from Oct. 1, when it was sanctioned by the Illinois commission.

Coal Trade Reviews

General Review

Anthracite trade marking time pending arrival of colder weather; shipments behind last year and general tone excellent. Bituminous just holding its own. High record ocean freights restrict exports. Contradictory developments at interior points.

Anthracite—There is an excellent tone to the hard-coal trade with conditions uniformly favorable. Mining operations are at full capacity and there is no demurrage coal in any direction. Collections are in a more satisfactory condition than for a long time, and dealers are showing a disposition to keep full stocks so that any cold snap will start coal moving all the way back to the mines. Shipments so far have been filled with reasonable dispatch, but it is difficult to anticipate what may develop with colder weather. Concessions on the regular circular have been generally eliminated and prices are well sustained. Lake shipments for the season to the first of the current month, are slightly behind last year, but the movement continues heavy in spite of high vessel rates. September shipments show a gratifying increase but the movement to date for the year indicates a deficiency of close to 3,000,000 tons that is yet to be made up.

Bituminous—The absence of any spot business is creating a tendency to shade the circular in several instances, while the general publicity regarding a possible car and labor shortage is not influencing shippers seriously, and many are eager to cover for deliveries up to the first of the year. Some small operators are sending considerable consignment coal to the market but this is readily absorbed for storage purposes. Shipments are beginning to come through more slowly as the season advances, and certain railroad centers are now beginning to show definite indications of a congestion. The market has stiffened up moderately, the price tendency being upward, and shippers as a rule will not commit themselves beyond the first of the year.

Exports—With ocean freights at the highest level in the history of the mercantile marine, negotiations involving further exports of coal are practically at a standstill, though there is still much inquiry noted. The movement still continues on charters negotiated at the more reasonable figures prevailing some time ago, but the tonnage is showing a discouraging falling off. The October dumpings at the Hampton Roads piers were substantially less than the September figures, while the Baltimore exports touched the lowest point for the past four months. There seems to be little prospects for any relief in the vessel situation.

Lake Markets—With the iron and steel industry apparently up to full capacity, there has been no further increase in the demand for prompt coal in the Pittsburgh district, though prices on contracts have stiffened up still further. The situation is in some respects contradictory. Shippers with several outlets, particularly toward Tidewater, are doing substantially better than those with a more restricted market. Canadian reports continue discouraging. For the time being the market is undoubtedly holding its own, but when the Lake movement is closed, there are some uncertainties to be faced. In Ohio, requisitions are steadily increasing, the congestion and slow movement on the railroads exerting a stimulating influence and causing some anxiety among consumers. The domestic trade is still marking time pending the advent of lower temperatures. There is little consignment coal in evidence.

Middle Western—The high temperatures have created a marked dullness in the Middle Western domestic coals, but prices have been firmly maintained. The steam demand continues on about the same basis as before, and there is no complaint heard in this branch of the business. Curtailed output has had a beneficial effect in sustaining the market. The future outlook on both steam and domestic grades continues as encouraging as ever, and shippers are anticipating a large business at profitable figures through the balance of the season. Shipments out from the upper Lake ports have also been affected by the warm weather, and have fallen off somewhat during the past week, though this is regarded as only temporary.

A Year Ago—Anthracite trade marking time pending more seasonable weather. Bituminous operators becoming discouraged at the long delay in the expected improvement. Shortage developing in ocean freights.

BUSINESS OPINIONS

Iron Age—The Steel Corporation's statement that its unfilled orders increased 847,000 tons last month gave the first definite measure of the steel trade's sensational leap forward in October. This is an unparalleled record but is thus only in keeping with all other developments in the current market. Price advances have had no effect of curtailing demand; it is in fact heavier now than at any other stage in the present remarkable movement. In the flood of orders in October domestic business figured to a larger extent than in many months. Exports in September of products reported by weight were 381,000 tons, against 401,000 tons in August. Values of all iron and steel exports, including machinery, were $38,400,000, against $37,727,000 in August. The scarcity of vessel room may have prevented the increase looked for in September, but the statistics raise the question whether the war export movement has yet reached its full maximum height.

Boston News Bureau—General confidence in this country is increasing every day. Conservative bankers are convinced that the commercial markets are making big strides forward. These close observers say that the country has been headed right for a considerable time but that now we have a breeze behind us and are speeding our pace up to maximum. Sometimes we are deceived because we are prone to take our cue from the security market, and whenever a reaction occurs there we attribute it to some serious defect in the general situation. But we forget that the stock market at times becomes overbought and that liquidation is the only corrective. It is best opinion that conditions are astonishingly sound. We are heavily long of both crops and money, two distinctively necessary ingredients.

The Southern Lumberman—Despite somewhat heavier shipments than orders with sharp increase in shipments and slight decrease in orders, the yellow pine market this week shows no diminution in strength, and in fact, when condition of stocks on hand is considered, the market is regarded as quite as strong as last week, which was the best week experienced by yellow pine manufacturers since the European war broke out. Price advances continue with remarkable frequency and from mills in all parts of the Southern producing territory. Better prices are also being obtained on numerous hardwood items this week, but such increases hardly keep up with the increased movement. This is due to a certain extent, no doubt, to the fact that the call is unusually well distributed and not centered on certain woods or particular grades of such woods, as is frequently the case.

Marshall Field & Co.—Current wholesale distribution of dry goods has been in excess of the corresponding period of a year ago. Road sales for immediate and spring delivery show marked increases and customers have been in much larger numbers. Collections are normal. Prices are firm.

Bradstreet—Two features loom large in this week's reports—the ever-widening activity of trade and the increased momentum attained in many industries. Out of these grow overtime in factory, mill and shop; progressive improvement in industries, almost wholly dependent on domestic wants; larger pay rolls; sustained, if not increased, demand upon jobbers and wholesale dealers; more confident future buying accompanied, however, by urgent calls for goods already ordered, and although mild weather has prevented retail trade in the cities from running its full course much of the slack in this respect has been taken up by increased buying in various country districts.

Dun—Though a full measure of recovery is not yet apparent in every branch of domestic enterprise, evidences of returning prosperity are multiplying throughout the commercial world. Of late, the constructive movement has swung forward with a rapidity seldom equalled, and in some respects recent developments are wholly lacking in precedent. Pronounced expansion in the volume of transactions and a further growth of optimistic sentiment featured the month just ended, when several new high records, including those of both production and distribution, were established.

ATLANTIC SEABOARD

BOSTON

Pocahontas and New River unchanged. Delivered prices for next season still show a downward trend. Georges Creek apparently in comfortable supply, but a mild flurry prevails in the preferred grades from Pennsylvania. Water freights advance. Anthracite trade satisfactory.

Bituminous—The Pocahontas and New River market shows the same features that have prevailed now for nearly a month. Prices f.o.b. are being held with reasonable firmness, but there is still a lack of spot business and in consequence a disposition here and there to shade the $2.85 basis. The Southern coals are in ample supply and no talk of car shortage has so far materialized in decreased shipments from the fields that find outlet through Hampton Roads. There is even an eagerness on the part of most of the agencies to place coal for delivery between now and Jan. 1. Contract demand is slightly improved, probably on account of the publicity given labor conditions in other regions, but dispatch is excellent and the requirements of consumers in this territory are being promptly met. Apparently a "flurry" in Pocahontas and New River is some weeks off.

A considerable factor in the New England situation is the unwholesome scramble that has been going on now for three or four weeks for contracts next season on a minimum delivered price basis. The canvassing is being done very quietly, but is none the less effective. As low as $3.40 on cars Mystic Wharf, Boston, Apr. 1, 1916, to Apr. 1, 1917, has been named on relatively small orders and already some of the larger buyers are showing their confidence that prices will go even lower. Each merchant is "protecting" his usual tonnage and the outcome is going to be very interesting.

There are still comfortable supplies of Georges Creek available at all the piers, and some of the far-sighted dealers are lining up for their winter requirements. Shippers of this grade who own their own transportation are profiting somewhat by the advance in water freights on such spot sales as they have made. F.o.b. prices on Georges Creek are so generally covered by contract in this territory that quotations rarely vary.

Cars all-rail are beginning to come through very slowly and certain of the transfer points show signs of congestion. There is every prospect that this condition will grow worse as the month advances and the first effect will be redoubled efforts on the part of consumers to get forward extra supplies.

Water Freights would have advanced more sharply had the rough weather continued. As it is, $1 has been paid to Boston from Hampton Roads and it is likely that $1.10@1.15 will be the market within a few days. Consumers are anxious over shipments on contract, particularly at points that will soon close to navigation, and the even balance of supply and demand has been upset.

Anthracite trade is active. Retailers have been unusually busy and they adhere to their policy of keeping full stocks for the season's demands. Broken is the size in shortest supply, but most requisitions are pretty well distributed between the other domestic sizes. The shipping companies are filling orders with reasonable promptness.

Bituminous quotations, f.o.b. loading ports at points designated, are about as follows per gross ton:

	Philadelphia	New York	Baltimore	F.o.b. Mine
Clearfields	$2.25@2.75	$2.55@3.00	....	$0.95@1.50
Cambrias and Somersets	2.45@2.95	2.70@3.20	....	1.20@1.65
Georges Creek	2.92@3.02	3.22@3.32	$2.85@2.95	1.67@1.77

Pocahontas and New River prices, on cars Boston, are $3.45@3.73. Providence, $3.45@3.63; and f.o.b. loading port at Hampton Roads, $2.80@2.85.

NEW YORK

No snap in hard coal, but prices are steady. Mining operations active with plenty of orders. Healthy situation in bituminous. Car shortage serious. No surplus at Tidewater and prices are good.

Anthracite—The desired snap is lacking in the anthracite trade. Conditions are generally favorable, except some colder weather will be necessary to give the desired snap. Most operators have sufficient orders now to keep them going for the next several weeks. Independent operators are now getting the full company circular for their prepared coals. Demand is such that there is no great amount of coal on the docks, but this scarcity is of no great moment at this time. Some shippers are experiencing trouble in getting shipments through from the mines on account of the freight congestion on nearly all roads leading to Tidewater.

Stove coal is the shortest of the prepared sizes. There is plenty of nut, while egg is easy and long; at times it is possible to pick up the latter size at from 5 to 10c. off, but this is the exception. In the line trade everything is bringing full circular. Pea coal is easy. Of the smaller coals the high grades are practically out of the market, some of them being quoted at slight premiums.

Quotations per gross tons, f.o.b. Tidewater, are as follows:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$5.05		$5.10	
Egg	5.30	$5.20@5.30	5.35	$5.25@5.35
Stove	5.30	5.20@5.30	5.35	5.25@5.35
Chestnut	5.55	5.40@5.55	5.60	5.50@5.60
Pea	3.50	3.25@3.50	3.55	3.50@3.55
Buckwheat	2.75	2.25@2.75	2.80	2.25@2.80
Rice	2.25	1.85@2.25	2.30	2.00@2.30
Barley	1.75	1.50@1.75	1.80	1.75@1.80

Bituminous—There has been no let-up in the demand for bituminous coal, but shippers are handicapped by the lack of cars. Large consumers are anxious to accumulate stocks before the usual winter transportation difficulties start in and are urging deliveries. While the railroads are in some instances giving operators about 75% of their quota of cars, the shipments equal but a little more than 50% of normal production.

Spot coal is not as plentiful as a week ago and good prices are being obtained as a rule. Many small operators are sending consignment coal to the local market, but unless it is of the poorer grades there is no trouble in marketing it.

Contract buyers are taking all the coal they can get and asking for extra lots. Prices are being well maintained and hardly any coal can be picked up at Tidewater for less than $2.70 f.o.b. Slack continues strong at from 95c. to $1. Exporters tell of many inquiries, but complain of lack of bottoms. Bunkering continues active.

Current quotations per gross tons, f.o.b. New York, are as follows:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.20@3.30	$3.20@3.30	$3.20@3.30	$1.75@1.85
Georges Creek Tyson	2.95@3.00	2.95@3.00	2.95@3.00	1.40@1.45
Clearfield:				
Medium	2.80@2.85	2.80@2.85	....	1.25@1.35
Ordinary	2.75@2.80	2.75@2.80	....	1.20@1.25
Broad Top Mountain				1.25@1.45
Cambria County:				
South Forks	3.05@3.10	....	....	1.50@1.60
Nanty Glo	2.90@3.00	....	....	1.35@1.45
Barnesboro	2.85@2.90	....	....	1.30@1.35
Somerset County:				
Quemahoning	....	2.90@3.00	2.90@3.00	1.35@1.45
Medium	2.80@2.90	2.80@2.90	2.80@2.90	1.25@1.35
Latrobe	2.70@2.75	....	....	1.15@1.20
Greensburg	2.90@3.00	....	....	1.25@1.35
Westmoreland	3.20@3.30	....	....	1.45@1.55
West Virginia Fairmont ¾		2.70@2.80	2.70@2.80	.90@1.10
Fairmont mine-run		2.70@2.75	2.70@2.75	.90@1.00
Steam		2.70@2.80	2.70@2.80	1.15@1.25
Western Maryland		2.70@2.80	2.70@2.80	1.15@1.25

PHILADELPHIA

Anthracite moving steadily. Advance in pea has little effect. Buckwheat well taken, with special grades scarce. Broken strong, egg off circular, stove firmly held, and chestnut improving. Bituminous continues active, with prices unchanged.

Anthracite—While there has been no special rush the business has been steady and satisfactory. It is apparent that most dealers have decided to carry full stocks and every cold snap from now on will bring business to both branches of the trade. We still consider the future bright for months to come. With the possible exception of egg size, all shippers are asking full circular prices. Everything is apparently going at full tilt, including all washeries, and there is not a car standing on demurrage at the scales.

There is much speculation among coal dealers as to when the state-tax "melons" will be cut and a great deal of good-natured dunning of the shippers to refund the tax. One or two of the larger concerns are quietly preparing checks and, after being assured by their legal departments that there can be no entanglements with the state, will probably do some clever advertising and cater to the good-will of their trade by trying to be the first to remit.

The raise in the pea coal price has had little or no effect on the coal trade. Large shipments are coming in, but it is practically all at the $2-and-tax price which has been protected until Jan. 1. The only sales noted at increased figures were to the out-of-town dealers or the smallest of the city trade. After the first of the year the price will surely stiffen and it is even intimated that it will go to $2.50 and the tax. Buckwheat is well cared for and at least one of the big companies will accept no business below $1.35 or $1.40. Special grades of this size have grown exceedingly scarce the past week, which is also the case with several special classifications of rice coal, although the latter is still heavy; thousands of tons of rice have been stored in the city during the last few weeks.

Of the larger sizes broken is all sold up with increasing inquiries noted from concerns desirous of storing from two to three months supply. Egg is dragging along at from 15 to 25c. off circular. Stove is very firm and maintains the lead in the family sizes, while chestnut is rapidly improving and is now bringing full circular in nearly all instances. Collections are quite satisfactory, and the good tidewater trade continues.

The circular prices per gross ton at the mines and for tide shipments f.o.b. Port Richmond are as follows:

	Line	Tide		Line	Tide
Broken	$3.50	$4.75	Pea	$2.50	$3.25
Egg	3.75	5.00	Buckwheat	1.50	2.25
Stove	4.00	5.00	Rice	.85	1.75
Chestnut	4.15	5.25	Barley	.50	1.50

Bituminous—It has been a most uneventful week, with the trade marking time. A good tonnage is moving, but the shippers are dissatisfied and believe that it should and could be very much heavier. The orders are on hand and it is difficult to tell whether the car supply or the growing labor shortage is the greatest contributing factor to the condition. No one doubts their ability to get plenty of new business, the greatest anxiety being to get shipments. Under such circumstances, of course, the mining people are not at all interested in tieing themselves up with contracts, although consumers are anxious and pressing hard to close at present prices for more or less long terms.

Only a fair export tonnage is moving vessels being scarce and freights high. Prices per gross ton at mines are:

Georges Creek Big Vein	$1.70@1.80	Fairmont gas, ¾	$1.35@1.45
South Fork Miller Vein	1.55@1.65	Fairmont gas, mine-run	1.20@1.25
Clearfield (ordinary)	1.20@1.30	Fairmont gas, slack	.90@1.00
Somerset (ordinary)	1.20@1.25	Fairmont lump, ordinary	1.15@1.20
West Va. Freeport	1.05@1.15	Fairmont mine-run	1.00@1.10
		Fairmont slack	.90@1.00

BALTIMORE

Falling off in export movement, and a greatly improved car supply are features of trade. Demand for all fuels fairly steady and market generally strong.

The falling off in export movement is the feature of the trade here. The principal reason is the excessive freight rates brought about by the fact that bottoms are naturally scarce and the grain trade is absorbing the better part of the ships that report here. During October a total of 139,652 tons was loaded for foreign ports, which is a decrease from the figures of September, August, July and June. Last week only 16,925 tons were loaded for foreign account, which makes it appear that November will show another falling off.

Car supply is much better. The election period lay-off at the outset of the month gave the railroads a chance to catch up. A little more free coal was offering, although the market remained firm at about the figures of the previous week. Prices in gross tons to the trade are as follows:

	Mines	Balt.*	Fairmont	Mines	Balt.*
Geo. Crk. Big Vein	$1.80	$2.98	Ordinary mine run	$0.95	$2.33
Geo. Crk. Tyson	1.50	2.68	Ordinary ¾	1.00@1.10	2.43@2.53
Clearfield	1.30	2.48	Ordinary slack	1.00@1.05	2.43@2.48
South Fork	1.50	2.68	Low sulphur mine-run	1.20	2.63
Latrobe	1.10	2.18	Low sulphur ¾	1.30	2.73
Somerset (best)	1.45	2.63	Low sulphur slack	1.00@1.05	2.43@2.48
Somerset (good)	1.25	2.43			
Quemahoning	1.35	2.53			
Freeport	1.10	2.18			
Miller Vein	1.30	2.38			

* F. o. b., outside Capes.

HAMPTON ROADS

Dumpings for week light. Total shipments for October 1,236,203 tons. High vessel rates curtail foreign business. Movement confined principally to contracts.

The dumpings for the week have been rather light both as to export and coastwise movement. Italy is still taking the greater part of the export coal but the number of cargoes for the week has been less than usual. The New England market as usual has taken the greater part of the coastwise movement. The government has loaded some coal into colliers for cargo and bunkers but these takings have not been extra heavy. The number of bunker steamers calling has also been light. There is practically no change in prices and few spot sales have been made during the week, the greater part of the movement being on contract.

During the month of October there was shipped from Hampton Roads ports a total of 1,236,203 tons of coal of which the Norfolk & Western Ry. dumped 637,005 tons, the Chesapeaks & Ohio Ry. 335,734 tons and the Virginian Ry. 263,464 tons. While the October movement was not a record it compares favorably with the monthly average since the beginning of the war. The scarcity of vessel tonnage for export cargoes and the high rates are largely responsible for the reduced movement in October as compared with September.

Railroad Tonnages—Dumpings over the local piers for the past five weeks compare as follows:

	Week Ending				
Railroad	Oct. 9	Oct. 16	Oct. 23	Oct. 30	Nov. 6
Norfolk & Western	140,934	145,236	163,920	126,145	......
Chesapeake & Ohio	93,344	66,361	81,517	74,028	78,210
Virginian	65,150	54,964	51,304	78,237	46,952
Totals	299,428	266,561	296,741	278,410	.....

Ocean Charters, Clearances and Freights

VESSEL CLEARANCES

The following steamers have cleared from various ports. during the week ended Nov. 6:

NORFOLK

Vessel	Destination	Tons
Anatres[2]	Vera Cruz	4,000
Swindon[3]	Messina	7,000
Rosalia[4]	Naples	6,376
Finland[5]	Rio de Janeiro	2,492
Achilles[6]	Cristobal	12,000
Torrington[3]	Genoa	6,900
Antigone	Buenos Aires	3,518
Ecclesia[7]	Italian Port	4,581
Llanishen[3]	Italian Port	4,481
		coke 870

NEWPORT NEWS

Vessel	Destination	Tons
Herald[8]	Bridgetown	4,500
Orkild[5]	Cienfuegos	3,690
Progresso[8]	Havana	5,784
Collier Vulcan[9]	Roads	7,203

BALTIMORE

Vessel	Destination	Tons
American	Martinique	893
American	Genoa	4,017
British	Genoa	7,304
American	Guadoloupe	1,580
Italian	Leghorn	1,830
Norwegian	San Domingo	1,331

PHILADELPHIA

Vessel	Destination	Tons
Sassel	Sweden	2,200
W. Sprague	Manzanillo	709
Clay[1]	Quincy Point	
Indian Ridge[1]	Boston	
Paxtang[1]	Boston	
Cleona[1]	Providence	
Spring[1]	Everett	
Thomaston[1]	Winthrop	
Cocalico[1]	Bangor	
Kimberton[1]	Portland	
Langhorne[1]	Portland	
Marion[1]	Dorchester	
Glendower[1]	Cambridge	
Silver Brook	Gloucester	
Irwin	Providence	
R. Stetson	New Bedford	
Hampshire	Boston	
Bethayres[1]	Bangor	
Saucon[1]	Portland	
Franklin[1]	Portland	
Beechwood[1]	Brookline	
Buck Ridge[1]	Boston	
Exeter[1]	East Boston	
Manning	La Pallice	
Brainerd	Martinique	
Yardley[1]	Portsmouth	
Bast[1]	Winthrop	
Tohickon[1]	Braintree	
Neshaminy[1]	Brookline	
Ephrata[1]	Chelsea	
Mingo[1]	Portsmouth	
Tamanend[1]	Sommerville	
Pickering[1]	Hallowell	
Moselem[1]	Gardner	

NEW YORK

Vessel	Destination	Tons
France		1
Canada		683
Trinida		207

[1] Phila. & Reading C. & I. Co. [2] Baker Whiteley. [3] Pocahontas Fuel Co. [4] C. & O. Coal & Coke Co. [5] Smokeless Fuel Co. [6] W. C. Atwater & Co. [7] New River Coal Co. [8] Berwind White. [9] Md. Coal & Coke Co.

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	To	Tons	Rate
G. H. Klinck	Camden	460	$1.00
W. D. Marvel	Calais	358	1.35
F. A. Allen	Calais	462	1.35
Thelma	Sagua	840	3.00
Novo	B. Aires	1,411	8.00
Sir Ernest	Sweden	3,378	
F. P. Brainerd	Martinique	800	

BALTIMORE

Vessel	To	Tons	Rate
Miner	Mexico	699	
Falk	Sweden		
F. W. Benedict	Martinique	750	
F. Palmer	San Juan	1,726	
Luckenbach	Key West	1,851	

VIRGINIA

Vessel	To	To	Rate
M. Baxter	Para	1,479	$6.00
B. P. Pendleton	Para	821	6.00
E. J. Lawrence	Barcelona	2,483	10.00[1]
H. Palmer	Lisbon	2,400	10.00[1]
A. Noble	Montevideo[2]	2,616	9.00
Orkild	Cienfuegos	1,623	

[1] About. [2] Buenos Aires or La Plata.

ATLANTIC RANGE

Vessel	To	Tons	Rate
Rhine	Newport News[1]	1,556	8.00

[1] Or Buenos Aires.

OCEAN FREIGHTS

The freight market is to-day at the highest level it has ever touched, and is still advancing. Over $18 per ton has been paid on grain to the west coast of Italy, and time charter rates advance daily. Tonnage is more than scarce and the few available boats are all asking for grain, making it very difficult to operate in coal. The market is changing daily.

To	Rate	To	Rate
Havana	$2.75@3.00	Bermuda	$3 50
Cardenas or Sagua	3.00@3.25	Vera Cruz	5.00@ 5.50
Cienfuegos	3.00@3.50	Tampico	5.00@ 5.50
Port au Spain, Trinidad	4.00@4.25	Rio	10.80
St. Lucia	3 75@4.25	Santos*	10.80
St. Thomas	3.50@3.75	Montevideo	10.80
Barbados	4.00@4.25	Buenos Aires or La Plata	†10.80
Kingston	3 00@3.25	Rosario	12.00
Curacao	3.75	West Coast of Italy	16.80@18.00
Santiago	3 25@3.50	Barcelona**	14.40@16.80
Guantanamo	3 25@3 50	Valparaiso or Callao	7.50
Demerara	6.00@6.50	Marseilles	15.60@16.80

* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British steamers; neutral steamers are more difficult to obtain and the rates are always higher.

W. W. Battie & Co.'s Coal Trade Freight Report.

LAKE MARKETS

PITTSBURGH

Prompt coal strong and unchanged. Contract coal slightly stiffer, particularly slack. Operations 75% of capacity. Car supply continues off.

The market for prompt coal has not stiffened further, but there is a decidedly stronger tone in contract coal, and particularly in slack. There has been no material increase in demand for free coal in the past week or two. The iron and steel industry had already worked up to its maximum capacity, while the same can be said of the railroads, which have had full employment for cars and locomotives for weeks. Domestic demand has not yet reached important proportions. For several weeks there has been stocking by railroads and to some extent by manufacturing consumers, while public service corporations, unable to take any risks, have been stocking steadily in a regular and conservative manner. With the recently improved outlook for coal the operators have been striving for production and thus the offerings are larger. The prompt market holds its own readily, but the market is nearing the time when Lake shipments will close, throwing additional coal on the market, before there is much demand for stocking coal against a possible mining suspension Apr. 1. It seems to be more or less generally expected that a wage advance will be demanded and granted, the uncertainty being chiefly as to whether or not the negotiations will be accompanied by a suspension of mining.

Gas slack has become distinctly stiffer and the slack market is quotable at a wider range than formerly. Mine-run is usually done at $1.15, though many operators are asking $1.25 and occasionally securing this price. We quote prompt coal as follows: Slack, 70@85c.; mine-run, $1.15@1.25; ¾-in., $1.25@1.35; 1¼-in., $1.35@1.50, per net ton at mine, Pittsburgh district.

There are scarcely any more car shortages than a week ago, but the supply in general is quite below the desires of the trade and there is considerable complaint. Mining operations are at about 75% of capacity in the Pittsburgh district.

Contract coal, to Apr. 1, is firmer, but former minimum prices are still done on the most desirable contracts, except as to slack, which is extremely stiff. Demand for slack has been such in recent weeks, with a large tonnage of ¾-in. being produced for the Lake trade, that it is considered rather unlikely that the normal course of production will furnish a sufficient supply through the winter, and the question is already being canvassed whether slack will eventually reach the mine-run price. It costs scarcely anything, it is stated, to install crushing machinery, so that whatever the demand for slack the market cannot advance above mine-run figure. We quote on contracts to Apr. 1: Slack, 90c.@$1; nut, $1@1.10; mine-run, $1.15@1.25; ¾-in., $1.20@1.30; 1¼-in., $1.30@1.40, per net ton at mine, Pittsburgh district.

BUFFALO

Difference of opinions regarding the market. Local market less active than Pittsburgh and Tidewater. Prices differ widely. Anthracite improving locally.

Bituminous—The movement is fair, but dealers are much divided as to both prices and demand. Those dependent on the Pittsburgh market, are asking prices considerably higher, while the Allegheny Valley shipper is finding the going hard. It is not easy to reconcile this difference. Pittsburgh and the districts that can ship to Tidewater are independent of this market and are in some instances quoting fictitious prices to evade commitments in this direction. Allegheny Valley producers are restricted to this market and have to sell for what the consumer will offer. The difference will probably not last long. At the same time this market is clearly waiting for a return of activity in Canada and till that occurs the bituminous trade here will be dull. Quotations, therefore, will have to appear a little out of level, being as follows:

	Pittsburgh	Allegheny Valley	Penn Smokeless
Lump	$2.80	$2.50	$2.55
Three-quarter	2.65	2.30	.....
Mine run	2.55	2.20	2.30
Slack	2.20	1.90	2.30

These quotations are for Buffalo and eastward to Rochester on a short-ton basis. East of Rochester all bituminous is sold on a long-ton basis.

Anthracite—There has been a steady improvement in the demand lately. Local retailers find that business is practically up to normal and likely to remain so far the rest of the season. It will take sometime to make up the lost tonnage, but the demand for chestnut is again very insistent. The other sizes are not so active, there being a wide difference between chestnut and stove. The through rail demand does not increase as fast as it should at this time of the year even with the shortage of cars.

There is now no difference in the company circular and the independents prices, all getting uniformly into line for winter. The circular for Buffalo is $5.60 for grate, $5.85 for egg and stove, $6.10 for chestnut, $4.30 for pea, $3.25 for buckwheat, $2.75 for rice and $2.50 for barley, all f.o.b. on cars, with 25c. additional for delivering on board vessels.

Lake rates are strong to Lake Michigan on account of the fleet going to Lake Superior for wheat. Milwaukee now pays 50c. which is an advance of 10c. Shipments for the week were 128,500 tons; for the month of October, 521,171 tons; for the season to November, 3,313,246 tons, as compared with 3,695,021 tons last season.

TORONTO, CAN.

Mild weather interferes with anthracite movement but bituminous shows improving tendency.

The domestic demand for anthracite is less than usual owing to continued mild weather. There is some improvement in the demand for bituminous, as manufacturing in many lines is showing increased activity. The shortage of cars is still retarding deliveries, and while there are generally plentiful stocks of all other grades, slack continues scarce. Quotations per short ton for best grades are as follows: Retail, anthracite egg, stove and nut, $7.75; grate, $7.50; pea, $6.50. Bituminous, retail, steam, $5.25; screenings, $4.25 to $4.50; domestic lump, $6; cannel, $8. Wholesale f.o.b. cars at destination, three-quarter lump, $3.79; screenings, $3.15.

COLUMBUS

Steam business continues strong while domestic is a little slow, due to warm weather. Circular well maintained. Prospects for the future are good.

Manufacturing in every line is still expanding and the fuel requisitions are growing larger. The expansion is not confined to iron and steel concerns but is noted in general lines of manufacturing. The tone of the market is correspondingly improved and prospects for the future continue bright.

The domestic demand is a little slow because of unfavorable weather. But reports show that stocks in the hands of retailers are not large and with a cold snap, business will undoubtedly show considerable activity. Holding up of shipments has been requested in a number of instances, but actual cancellations of orders are not common and retail prices are ruling firm.

Lake trade is attracting considerable attention and chartering of bottoms is going on actively though prices are high. There will be activity in the Lake trade right up to the close of navigation.

Car shortage is growing worse as the winter approaches. This is especially true on the Chesapeake & Ohio and the Baltimore & Ohio. Other roads are also feeling the shortage. Circular prices are generally well maintained. There is a good demand for the small sizes because of the lessened supply.

Prices in Ohio fields f.o.b. mines, per short ton, are as follows:

	Hocking	Pomeroy	Eastern Ohio	Kanawha
Re-screened lump	$1.60	$1.65	.....	.....
Inch and a quarter	1.50	1.50	$1.35	$1.50
Three-quarter-inch	1.35	1.40	.....	1.35
Nut	1.25	1.30	.....	1.25
Mine-run	1.15	1.20	1.05	1.10
Nut, pea and slack	.70	.75	.65	.60
Coarse slack	.60	.65	.55	.50

Mines have been working at about the following percentages of full capacity:

District	Week Ended				District	Week Ended			
	Oct. 16	Oct. 23	Oct. 30	Nov. 5		Oct. 16	Oct. 23	Oct. 30	Nov. 5
Hocking	55	60	65	60	Cambridge	60	60	65	70
Jackson	40	60	50	45	Massillon	60	45	70	70
Pomeroy	85	65	90	85	Eastern O.	85	85	80	80
Crooksville	50	85	65	65		—	—	—	—
					Average	62	65	69	67

CLEVELAND

Demand keeps up fairly well, but warm weather retards activities. Supply of coal becomes limited in some lines. Market generally up.

Two kinds of coal are practically out of the market here. Fairmount grades are too expensive as they have been for weeks and Youghiogheny slack is really scarce. Jobbers reported this week they could not buy large tonnages for immediate delivery and had to pay 90c. a ton at the mines for a few cars at a time. The supply of coal is being kept down as factories are laying in somewhat larger stocks. The late shipping to the Lakes is now under way, and as regular shipments cannot be counted on after Nov. 20, operators are giving as much coal to the Lake trade as it will stand. Although Lake shipments are not as large as usual, they are heavier than a few weeks ago.

Bergholz and Massillon mines are behind on their orders of domestic sizes. The dealers did not do much buying early in the fall and when they did come in the operators were given more business than they could fill immediately. There has been no cold weather to force domestic buying, but the trade is fair and steady. A turn of cold weather would bring a rush of orders that would swamp the retailers for a few weeks.

The market generally is up with jobbers paying the following prices f.o.b. Cleveland per short ton:

	Pocahontas	Youghiogheny	Fairmont	Bergholz	Ohio No. 8
Freight rate......	$1.45	$1.00	$1.15	$0.70	$0.90
Lump............	3.60				
Lump, 6-in........				2.30	
Lump, 1¼-in.......		2.40		2.10	2.15
Lump, ¾-in.......		2.30	2.15	2.00	1.95
Egg..............	3.60				
Egg, 6-in				1.90	
Mine run.........	2.75	2.15	2.05	1.90	1.85
Slack............		1.90	2.00@2.05	1.70	1.70

TOLEDO

Pocahontas strong and lake shipments show advance for season. Steam coal strengthening. Car shortage becoming more apparent.

There is a better call for domestic coal and the steam grades are again coming into stronger demand. The close of navigation is now in sight and everybody is running their final shipments of Lake coal through as rapidly as possible. The car shortage has become quite apparent and it is already difficult to secure sufficient gondola cars. The Lake shipping has not been heavy this season although all of the docks have been pretty heavily rushed lately.

Pocahontas is keeping up well and the circular is being closely maintained. The mine price per short ton on Pocahontas lump and egg is firm at $2.25. Nut is bringing $1.75 while slack is quoted at $1.25 and is very short due to the heavy demand from the steel mills. Domestic trade generally is not so strong because of the continued warm weather but steam coal is moving well. The car shortage is beginning to be generally felt although no serious situations have as yet developed.

DETROIT

Domestic trade feels stimulus of colder weather. Steam coal more active. Anthracite demand improves. Lake trade approaching the end.

Bituminous—Following a lapse in demand during the past two weeks, steam coal is again showing signs of increased activity. Orders are appearing more frequently, though the amount taken is usually not very large. Continued activity of industrial plants, with increasing production in some instances, adds encouraging basis for the belief that the improvement will be maintained.

Orders for domestic sizes are also more frequent with the coming of lower temperatures but shippers and jobbers have not benefited much as yet. Little consignment coal is now in evidence, lump and egg sizes being the most plentiful with occassional sacrifice sales. Prices generally are holding steady. Complaints of car shortage in some of the mining districts are more numerous, but the condition has caused little trouble as yet.

Anthracite—There is fair activity in distribution of anthracite from retail yards, though the dealers seem to have adequate supplies for the time being. Car shortage on Eastern lines may become an important factor in the situation later.

CINCINNATI

Continued scarcity of cars is the leading factor in the market. Demand still relatively sluggish, due to mild weather. Prices steady.

The shortage of cars, the supply averaging only about 33 to 40% of requirements, has held the market and had a stimulating effect on business. Except for this the trade would be almost back to the summer dullness. The retail trade is taking very little coal, and the industrial demand has not increased, so that the scarcity of cars has not caused any anxiety among consumers. This is worrying the trade considerably, however, as the demand is certain to be heavy when a cold snap comes. Prices are stiffening, and bid fair to be much higher.

LOUISVILLE

Warm weather depresses the market but the outlook is considered favorable. Car supply somewhat better.

Continued abnormally mild weather is exerting a depressing influence on the domestic market. Dealers are stocking more readily, however, and shipments have been somewhat better. The car shortage eased up a little and gave the Eastern Kentucky mines an extra day during the week. The steam coal sales are somewhat brisker and the outlook in both classes is considered good.

Sales have been made during the week, f.o.b. mines, long ton basis, at from $1.75 to $2.10 or $2.15 on Eastern Kentucky block with steam nut and slack continuing to sell around 40 to 50, and 70 to 75c., according to grade. The Western Kentucky market is still around $1.25 for lump while the prices on pea and slack are variable.

BIRMINGHAM

Business continues to slowly improve. Heavy movement of river coal.

While business is not picking up as rapidly as hoped for still conditions are better than they have been for the past two years, both on steam and lump coal, and the prospects for a steady improvement during the coming fall and winter are exceedingly good. Prices are holding up well and collections are better than at any time in the past two or three years. River coal is moving in large quantities to Mobile and New Orleans, and while this is effecting the all-rail mines to some extent, the tonnage moving from the latter is far in excess of that for the same period last year.

COKE

CONNELLSVILLE

Prompt furnace coke easier. Some business for next year. Prompt and foundry coke stiffer, with good prospects. Production and shipments increased further.

The pressure for prompt furnace coke seems to have ended late last week, producing an easier market even then, while this week demand is very light and no definite market has been developed. This week's outside price is not above last week's inside price. Contract furnace coke is not moving very rapidly, unless more business has been closed than appears on the surface. One contract has been closed for 10,000 tons a month over 1916 at $2.25 flat, but the market for the early months is above this, while for the late months coke is expected to be cheaper as so many byproduct ovens are to be completed in the second quarter of next year.

Foundry coke is stronger and operators are very firm in their views as, considering the likelihood of box cars being very scarce, and prospects of increased foundry operations, the foundry coke market shows promise of being able to take care of itself better than the furnace coke market. We quote: Prompt furnace, $2.40@2.50; contract furnace, first half, $2.35@2.50; year 1916, $2.25@2.35; prompt foundry, $3@3.25; contract foundry, first half, $3@3.25, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Oct. 30 at 432,519 tons, an increase of 4,200 tons, and shipments at 441,911 tons, an increase of 4,363 tons.

Buffalo—There is the same feverish activity in coke. So many prices are quoted to stave off orders that it is not easy to obtain an authentic one. Jobbers are paying all the way from $4.85 to $5 for best 72-hr. Connellsville foundry. Stock coke is practically out of the market, the quotation being about $4.10.

Columbus—Coke demand is strong and prices have advanced about $1 per ton during the past 60 days. Pocahontas is moving well and the same is true of White and Red Ash. Anthracite is also in better demand.

Birmingham—There is nothing new in the coke market for the past week. The demand from the furnace companies continues steady and furnace coke is finding a good market at satisfactory prices.

MIDDLE WESTERN

ST. LOUIS

High temperatures depress the market. Prices show a softening tendency.

Under the influence of high temperature there has been marked dullness during the week. A determined effort is being made to prevent rate demoralization and in the main the prices are holding but some who were forced to move Standard during the week let No. 6 lump and No. 2 lump go at 5 and 10c. less than the quotations. Reduced output has stimulated the price of screenings.

Quotations f.o.b. mines during the past week have ranged on the following basis per short ton:

	Frnk. Co.	Wlmson. Co.	Staunton	Standard
6-in. lump	$1.50@1.75	$1.50@1.75	$1.25@1.35	$1.20@1.25
8-in. lump	....	....	....	1.25
2-in. lump	....	....	1.15@1.20	1.10
3x6 egg	1.40@1.75	1.40@1.65	....	1.00
2x6 egg	....	....	....	.80@.85
No. 1 nut	1.50@1.75	1.50@1.75	....	.80
No. 2 nut	1.40@1.50	1.40@1.50	....	.60
No 1 washed	....	1.65	1.50	....
No 2 washed	....	1.25	1.10@1.25	....
No. 3 washed	....	1.25	1.00@1.25	....
No. 4 washed	....	1.20	1.05	....
No. 5 washed	....	.60@.70	.50@.60	....
Screenings	.60@.65	.60@.65	.25@.35	.25@.35

DULUTH

Moderate weather causes a lull in shipments. No increase in receipts. Prices remain stationary.

The extraordinary mild weather for this time of year has caused a slight falling off in shipments. Agencies that cater to the dealer and retail trade report a temporary lull in the demand for coal. The inquiry from steam users and the railroads is well up to the average and no complaint is heard regarding this class of business. Receipts show no material changes from last week. Quotations per short ton f.o.b. cars, docks, Duluth, are as follows:

	Yough	Splint	Hock	Smokeless	Elkhorn
Lump	$3.40	$3.40	$3.40	$4.75	$3.75
Dock run	3.10	3.10	3.05	3.25	3.25
Stove or nut	3.40	3.40	3.40	4.75	3.65
Screenings	2.40	2.40	2.25	2.75	2.40

In spite of the very mild weather a fair volume of business is being done in the anthracite trade. The householder is laying away a few tons in anticipation of a cold snap in the very near future, and as a result the dealers and retailers report that the domestic demand is well maintained. Quotations per short ton f.o.b. cars, docks, Duluth, are as follows: Egg and stove, $6.85; nut, $7.10; pea, $5.55 and buckwheat, $4.

PRODUCTION AND TRANSPORTATION STATISTICS

ANTHRACITE SHIPMENTS

The shipments of anthracite as reported to the Anthracite Bureau of Information amounted in October to 6,505,892 long tons. This showed an increase over the preceding month of September of 987,121 tons, but was still 138,584 tons short of the shipments in October, 1914.

The total shipments for the first ten months of 1915 amounted to 53,885,003 tons, against 56,712,057 tons in 1914, a decrease so far this year of 2,827,054 tons.

The shipments for October include all the coal moved from the breakers or washeries. In previous statements a relatively unimportant quantity put into storage by one of the transportation companies was not included.

Anthracite shipments for October and the first ten months of 1914-15 were as follows:

	October		10 Months	
	1915	1914	1915	1914
Phila. & Reading	1,199,284	1,092,056	9,195,089	9,961,608
Lehigh Valley	1,266,539	1,391,144	10,714,002	10,941,943
Cent. R.R. of N.J	895,895	892,386	6,532,694	7,452,435
Del. Lack. & West	888,609	990,570	7,679,800	8,128,793
Del. & Hudson	701,279	678,104	6,671,603	6,032,697
Pennsylvania	637,052	611,593	4,870,961	5,308,918
Erie	708,007	773,866	6,524,667	6,943,394
Ont. & Western	209,227	214,757	1,696,187	1,942,269
	6,505,892	6,644,476	53,885,003	56,712,057

Stocks at Tidewater Oct. 31 were 625,821 tons.

NEW YORK EXPORTS

The value of the fuel exports from New York for September were as follows:

Anthracite		Bituminous		Coke	
Canada	$72,608	Canada	$483	Italy	$12,720
Guatemala	22	Mexico	1,005	Norway	7,800
Panama	860	Trinidad and Tobago	4,000	Guatemala	39
Salvador	9	Cuba	1,900	Salvador	12
Mexico	175	Haiti	9	Mexico	1,099
Newfoundland and Labrador	4,192	Santo Domingo	45	French West Indies	161
Jamaica	20	Brazil	106	Brazil	240
Other British West Indies	494	Colombia	30	Chile	816
Cuba	341	Venezuela	53	Colombia	96
Santo Domingo	6,448	**Total**	7,631	Ecuador	227
Argentina	955			Total	23,210
Chile	2,774				
Venezuela	282				
Total	89,180				

EXPORTS

Exports of domestic coal and coke from the United States, and bunker coal laden on vessels engaged in the foreign trade at the specified districts, during the month of August, 1915, were as follows:

	Anthracite	Bituminous	Coke
Maine and New Hampshire	1,418	22	......
Maryland	2,128	210,760	5,775
Massachusetts	119	....	......
New York	35,848	8,656	725
Philadelphia	9,499	154,965	1,742
Porto Rico	......	245	2
Virginia	212	662,122	2,125
Mobile	......	348	......
New Orleans	......	997	18
Arizona	......	5,546	7,840
El Paso	......	8,115	17,911
Laredo	......	1,986	......
Alaska	......	63	......
San Francisco	......	22	22
Southern California	1	17	......
Washington	......	288	3,994
Buffalo	128,190	166,113	31,708
Dakota	541	2,098	205
Duluth & Superior	2	1,301	41
Michigan	......	33,032	6,637
Ohio	8,000	643,216	2,123
Rochester	52,119	83,025	505
St. Lawrence	68,598	16,971	1,657
Vermont	472	940	55
Total	307,147	2,000,848	83,085

BUNKER COAL

Districts	Gross Tons	Districts	Gross Tons
Maryland	52,914	Philadelphia	42,862
New York	257,570	Virginia	188,228

I. C. C. DECISIONS

I. C. C. Nos. 4,705, 6,526, 4,875—Coal Switching Reparation Cases at Chicago.

Upon presentation of the issue whether or not complainants have been damaged and are entitled to reparation because of the payment of charges on carload shipments of coal, **Held:**

1. That complainants in Gilmore & Co. v. C. & N. W. Ry. Co. and in Hinners Co. v. N. & W. Ry. Co. have not proven that they were damaged by the payment of charges which were found to be unjustly discriminatory. In a discrimination case the measure of damage is not the difference between the two rates, but is a fact that must be proven with the same definiteness as would warrant a judgment in a court of law.

2. That complainants in Lill & Co. v. C., M. & St. P. Ry. Co. have been damaged and are entitled to reparation to the extent of 10 cents per ton on certain shipments and 5 cents per ton on others because of charges which were found to be unreasonable. No damage proven on that part of the charges which was found to be unjustly discriminatory.

I. C. C. No. 7261—American Coal & Coke Co. vs. Michigan Central R.R. Co.

On complaint that defendant unjustly discriminates against and unduly prejudices complainant by refusal to extend credit to it with respect to freight and demurrage charges accrued on carloads of coal held at Windsor, Canada, and Detroit, Mich., while extending credit to competitors under like circumstances: **Held,** That the evidence fails to show that complainant is discriminated against or prejudiced within the meaning of the act.

FOREIGN MARKETS

GREAT BRITAIN

Oct. 22—The scarcity of tonnage is more pronounced. Coal stocks are excessive and prices weak. Quotations are nominally as follows:

Best Welsh steam	Nominal	Best Monmouthshires	$4.44
Best seconds	Nominal	Seconds	4.32
Seconds	$4.44	Best Cardiff smalls	2.76
Best dry coals	5.64	Cargo smalls	1.92

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusively of wharfage.

Freight—Chartering is restricted owing to tonnage scarcity. Rates all round continue very firm and are approximately as follows:

Gibraltar	$6.72	Naples	$9.60	St. Vincent	$7.80
Marseilles	9.65	Alexandria	11.16	River Plate	10.20
Algiers	7.72	Port Said	11.16		
Genoa	9.60	Las Palmas	6.60		

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

+Indicates contracts regarding which official information has been received.

Recast

In the following table we give a list of all old contracts coming up for consideration during the ensuing week. The table gives our contract number, the name of the purchaser, city tonnage and page on which the detail notice appeared.

No.	Purchaser	City	State	Tonnage	Page
1576	Lane Cotton Mills	New Orleans	La.	50 (cars)	700
1579	Cosmopolitan Hotel	New Orleans	La.	120 tons[1]	700
1603	Springfield Santr.	Krumroy Sta.	Ohio	15,000b	737
1605	State Capitol	Frankfort	Ky.		737
1622	City Government	Spokane	Wash.	600[2]	787

b Indicates bituminous. [1] Per month. [2] Carload lots.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

+1356—Storm Lake, Iowa.—This contract (p. 411), providing for furnishing the local light and water department with coal during the ensuing year has not yet been let, the plant having changed hands, now being owned by a Boston firm—Hooper, Kimball & Williams. This contract involves approximately $5,700 worth of coal. Address Dist. Mgr. C. H. Utter, Grinnell, Iowa.

1551—East St. Louis, Ill.—Swift & Co. have not yet decided whether to close this contract (p. 660) or continue purchases in the open market as they have been doing for the past several months. Address Pur. Agt. H. C. Huggins, Swift & Co., East St. Louis, Ill.

1557—East St. Louis, Ill.—Purchases on this contract (p. 661), which provides for furnishing Morris & Co. with approximately three or four cars of screenings per day are still being confined to the open market, though a contract may be let later. Address Pur. Agt. L. Chakes, Morris & Co., East St. Louis, Ill.

+1569—Winner, S. D.—This contract (p. 699), which provides for furnishing bituminous coal, as may be required at the local Court House during the coming winter, was bid on as follows: Montgomery Lumber Co., $9.50; James A. Smith Lumber Co., $9; Floete Lumber Co., $8.50. Address Audr. F. E. Wells, Winner, S. D.

1573—Philadelphia, Penn.—Bids on this contract (p. 699, see also contract 1516, pp. 577, 660), calling for additional supplies on a deficiency contract until the end of the present year, were as follows: Belmont Pumping Station, 6,900 tons pea, Smith, Lineaweaver & Co., $3.47; Belmont Pumping Station, 6,900 tons pea, Susquehanna Coal Co., $3.47; Queen Lane Filters, 300 tons pea, Philadelphia & Reading Coal and Iron Co., $4.11; Spring Garden Pumping Station, 100 tons pea, Philadelphia & Reading Coal and Iron Co., $3.48; Queen Lane Pumping Station, 7,400 tons buckwheat, Philadelphia & Reading Coal and Iron Co., $2.72; Roxborough Auxiliary, 1,000 tons buckwheat, Philadelphia & Reading Coal and Iron Co., $3.11; Belmont Pumping Station, 2,300 tons buckwheat, Susquehanna Coal Co., $2.43; Lardner's Point Pumping Station, 17,000 tons buckwheat, Emmons Coal Mining Co., $3.04. Address Dir. Herman Loeb, Dept. of Supplies, Philadelphia, Penn.

+1583—New York.—Bids have been received on this contract (p. 700), which provides for furnishing the Department of Docks and Ferries with approximately 2,000 tons of No. 3 buckwheat for the Borough of Richmond, as follows: Pattison & Brown, $1.97; Joseph P. O'Connor, $2. The contract has not yet been awarded. Address Comr. R. A. C. Smith, Pier "A," New York.

1584—New Orleans, La.—This contract (p. 700), which provides for furnishing William Henderson with approximately 50,000 tons of coal will be closed some time in December. Address William Henderson, 749 South Peters St., New Orleans, La.

+1585—Montclair, N. J.—This contract (p. 700), which provides for furnishing the Montclair School with 600 tons of pea and 70 tons of stove coal has not yet been awarded there being only one bidder and the state laws prohibiting closing the contract under this condition. Formal request has been made to continue purchases in the open market which is expected will be granted. Address Chn. Melvin A. Rice, Normal School Committee, State House, Trenton, N. J.

New Business

1624—Louisville, Ky.—The Southern Brick and Tile Co., at this place will contract some time in December for their annual requirements of coal involving 5,000 tons of nut and slack, 1,500 tons of nut, and 1,000 tons of mine-run. The company has a storage capacity of 3,000 tons, and deliveries are made by railroad at the rate of about 25 tons per day. Address Pur. Agt. T. Bishops, 13th and Ormsby St., Louisville, Ky.

+1625—Marshall, Minn.—Bids were received until 7.30 p.m., Nov. 8, for furnishing the City Power Plant with approximately 1,800 tons of any of the following grades of coal: Franklin County 2-in. screenings; Miller Creek 2-in. screenings; West Virginia White Ash Splint, 2-in. screenings; Youghiogheny (thin vein) 2-in. screenings; Carterville Washed nut; General Wilmington Washed Carbon; Semi-anthracite 2-in. screenings. Deliveries are to be in carload lots on the sidetrack at the city power plant near the C. and N. W. R.R. Address Recorder T. L. Bumford, Marshall, Minn.

+1626—New York, N. Y.—The Board of Trustees of the Bellevue and Allied Hospitals will receive bids until noon Nov. 15, for furnishing and delivering approximately 3,000 gross tons of buckwheat No. 1. Delivery is to be completed by Dec. 31. For details concerning the bids and award on the previous contract see No. 1415, pp. 448 and 662. Address Auditor, Board of Trustees, Bellevue and Allied Hospitals, 400 East 29th St., New York City.

+1627—Belfield, N. D.—The Board of County Commissioners at this place will receive bids until 2.30 p.m. Nov. 15, for furnishing either lignite or Western bituminous coal, as may be required at the local court house during the ensuing year. Successful bidder will be required to furnish a bond for $400. Address County Aud. J. L. Hughes, Belfield, N. D.

+1628—Newark, N. J.—Bids will be received between 2.30 and 3 p.m., Nov. 22, for furnishing the Newark City Hall at Verona with approximately 1,000 gross tons of pea coal. Complete details may be had on application. Address Secy., Carl Heller, Mayor's Office, City Hall, Newark, N. J.

+1629—Beach, N. D.—The Beach School Dist. No. 3 received bids until 8 p.m., Nov. 3, for furnishing coal as may be require at the local School Houses during the ensuing year. All bids were to be f.o.b. track at Beach. Address Clk. C. O. Halvorson, Beach School Dist. No. 3, Beach, N. D.

1630—Buffalo, N. Y.—G. Elias & Bro., Inc., require about 1,000 tons of coal during December, January, February and March. The company has no contract. Deliveries are made by railroad at the rate of 250 tons per month. Address Pur. Agt. I. Gillespie, G. Elias & Bro., Inc., 965 Elk St., Buffalo, N. Y.

1631—Council Bluffs, Iowa.—The City Council received bids until 7:30 p.m., Nov. 1, for furnishing coal as may be required during the coming season. Bids were requested on Centerville, Iowa, 8-in. lump, Nokomis 1¼-in. lump, Witt 1¼-in. lump, Hillsboro 1¼-in. lump, Taylor Springs 1¼-in. lump, Lehigh Valley anthracite range and egg coal. All bids were to be accompanied by a certified check for $100. Address City Clk. Charles J. Duff, Council Bluffs, Iowa.

+1632—Greenville, Ohio—The Darke County Board of Commissioners will receive bids until 10 a.m., Nov. 13, for furnishing approximately 100 tons of Pocahontas lump coal, f.o.b. cars, P. C. C. & St. L. sidetracks at Greenville. A deposit of

$25 must accompany each bid. Address Clk. G. H. Garrison, Darke County Board of Commissioners, Greenville, Ohio.

+1633—New York, N. Y.—The Central Purchasing Committee will receive bids until Nov. 22 for furnishing and delivering 10,000 tons of anthracite coal to the departments of Corrections, Public Charities, Parks (in Brooklyn) Fire, Water Supply, Gas and Electricity. Address Central Purchasing Committee, Room 1226 Municipal Bldg., New York City.

Contracts Awarded

Note—Successful bidders are noted in **bold face type.**

1361—Davenport, Iowa.—This contract (pp. 411, 616), which provides for furnishing the fuel requirements of the Moline Rock Island Manufacturing Co. and the Tri-City Railway and Light Co., was awarded to the **Alden Coal Co.** of Davenport, and the **Spoon River Coal Co.,** of Rock Island, Ill. The combined companies consume approximately 75,000 tons of 1¼-in. screenings per annum. Address Pur. Agt. George G. Kuhn, Moline Rock Island Mfg. Co., Davenport, Iowa.

+1423—Topeka, Kan.—The tonnage involved on this contract (pp. 489, 662), awarded to the **Southwestern Coal Co.,** is 2,400 tons instead of 400 tons as previously noted. Address Supt. E. G. Stahl, Municipal Electric Light Dept., Topeka, Kan.

+1496—Virginia, Minn.—This contract (p. 577), which provides for furnishing the City Government with approximately 100 tons of either Pocahontas or anthracite buckwheat, egg, nut or stove coal, has been awarded to **Johnson & Peterson.** Address City Clk. Albert E. Bickford, Virginia, Minn.

+1506—Trenton, N. J.—This contract (p. 577), which provides for furnishing the New Jersey State Prison with coal as may be required at different camps during the ensuing year has been awarded to **Max Feinshein** as follows: Bituminous, $3.35; broken, $5.35; stove, $6.30. Address Fiscal Agt. J. P. McCormack, State Prison, Trenton, N. J.

+1544—Nebraska City, Neb.—This contract (p. 617), which provides for furnishing the Otoe County Board of Commissioners with approximately 140 tons of coal, has been awarded to the **Otoe Lumber Co.,** at $3.96 per ton for Missouri screened soft coal. Address County Clk. Louis J. Stutt, Nebraska City, Neb.

+1556—Youngstown, Ohio—This contract (p. 661), which provides for furnishing the Mahoning County Commissioners with three-quarter inch screened coal as may be required at the Court House and Jail during the ensuing year, has been awarded to the **Youngstown Coal and Supply Co.** at $2.35 per ton. Address Clk. Frank H. Vogan, Mahoning County Comrs., Youngstown, Ohio.

1579—New Orleans, La.—This contract (p. 700), which provides for furnishing the Cosmopolitan Hotel with approximately 120 tons of coal per month, has been awarded. Address Major Stewart, Cosmopolitan Hotel, 120 Bourbon St., New Orleans, La.

1582—Erie, Penn.—This contract (p. 700), which provides for furnishing approximately 25 cars of three-quarter screened Pittsburgh lump coal, has been awarded to **E. J. Gebhardt** at $1.95 per ton. Address County Controller, Joseph E. Leslie, Erie, Penn.

1587—Jeanette, Penn.—This contract (p. 700), which provides for furnishing the Jeanette Borough School District with coal as may be required during the ensuing year, has been awarded to the **Westmoreland Coal Co.** at $1.40 per gross ton for mine-run coal f.o.b. mines. Address Secy. J. V. Rovensky, Jeanette Borough School Dist., Jeanette, Penn.

+1595—Hollidaysburg, Penn.—This contract (p. 736), which provides for furnishing the county government with coal has been awarded to the **Thermic Coal and Supply Co.,** on their "E" Vein bituminous coal as follows: 700 tons for delivery at the heating plant in the jail yard, $1.99; 80 tons for delivery at the Williamsburg Training School, $2.50. Address County Consumer, P. W. Tobias, Blair County, Hollidaysburg, Penn.

1596—Kenmare, N. D.—This contract (p. 736), which provides for furnishing coal for the various City Departments as may be required during the ensuing year, has been awarded to **Jonas Johnson,** at $2.65 per ton for lignite coal delivered. Address City Audr. Evan Griffith, Kenmare, N. D.

Contract Notes

Philip, S. D.—The bid of the Atlas Lumber Co. to furnish hard coal for Haakon County was accepted at $13.25 per ton.

Mankato, Minn.—Contract for furnishing the local jail, court house and poor farm with coal during the ensuing year has been awarded to **S. K. Fowler** at $5.75 for Island Creek splint coal.

Wibaux, Mont.—The contract for furnishing the local County Government with coal during the ensuing year has been awarded to the **Midland Coal and Lumber Co.** Address County Cl. J. R. Chappell, Wibaux, Mont.

Danbury, Conn.—On the contract for furnishing the City Hall with approximately 100 tons of egg coal, E. C. Marsh & Co., bid $7 per short ton, including cost of delivery. Address Chn. A. H. Fillow, City Hall, Danbury, Conn.

Springfield, Mo.—A contract has been let by the county commissioners of Greene County, for the coal supply for the court house and county jail, until Sept. 1, 1916, to the **Merchant's Ice and Fuel Co.,** of Springfield, at $3.40 a ton, delivered, for Kansas deep shaft coal.

Philadelphia, Penn.—C. J. Milne & Sons, at this place, consume about 2,000 tons of bituminous coal per annum, deliveries being made on the railroad siding at their plant. They have a storage capacity of 150 tons. Address the Purchasing Agent, C. J. Milne & Sons, 11th and Washington Ave., Philadelphia, Penn.

Philadelphia, Penn.—Pecora Paint Co., at this place, consumes about 600 tons of anthracite coal per annum. They have storage capacity for 100 tons, and deliveries are made by railroad at the rate of about 50 tons per month. Address Pur. Agt. F. B. Bowen, Pecora Paint Co., 4th and Venango St., Philadelphia, Penn.

Troy, N. Y.—The Aird-Don Co. at this place consume approximately 250 tons of bituminous coal per annum, deliveries being made by railroad and wagon at the rate of about one car a month. They have storage capacity for about 25 tons. Address Pur. Agt. Thomas C. Boswell, care of Aird-Don Co., 411 River St., Troy, N. Y.

Philadelphia, Penn.—The anthracite shippers in this territory are understood to be quietly notifying their contract customers that owing to possible trouble in the region on Apr. 1 no contracts will be made on Jan. 1, at which time most anthracite contracts expire, but that the old contracts will be carried over until Mar. 31, 1916.

Louisville, Ky.—Sam D. Jones, business manager for the Board of Education of the public schools of Louisville, is considering making use of natural gas in the heating plants of the public school buildings, in place of coal which is now used. General installation of gas heating plants will not be possible at the outset because the service pipes of the Louisville Gas and Electric Co. are not available for more than a few of the schools. For bids and award on the school contract see contract 730, Vol. 7, p. 916, Vol. 8, p. 78.

New York—By purchasing their coal supply through the Central Purchasing Committee, 28 city departments have been able to buy at reduced prices. According to a recent report of the Committee there has been an average reduction of 2.7c. in the price of chestnut coal, 31.6c. in the price of buckwheat No. 3 and 40c. in mine-run. The committee has purchased during the present year 269,199 gross tons of coal and the average price of chestnut coal was $6.544 per gross ton as against $6.571 paid in 1914; buckwheat No. 3, $2.351 per gross ton as against $2.667 and for mine-run $3.136 per gross ton as against $3.536 per gross ton paid in 1914.

Foreign Notes

Brazil—An American consular officer in Brazil reports that a firm in his district desires prices for charter shipments, f.o.b. New York or other water points, on coal. Statements of analyses should be sent.

Portugal.—Prices of coal in Portugal, already double what they were before the war, are gradually increasing, and the supply of fuel on hand is very small. The latest quotations for Welsh coal are $10.20 to $10.70 and $11.90 to $12.90 c.i.f. Lisbon. Lower qualities bring $9.25 to $9.50. The English freight rate is also advancing and is now $4.15 to $4.85 a ton. It is admitted that America could supply this market if freights from the United States were around $4.85 to $6.10 per ton.

Italy.—The British steamship Washington has been chartered to carry a cargo of 7,000 tons of coke to Italy. The vessel is now loading its cargo at the Port Richmond piers of the Philadelphia & Reading Ry. at Philadelphia. The coke has been furnished by the Public Service Corporation, Camden, N. J., from their byproduct coke ovens. The shipment of American coke to a foreign port is exceptional and is brought about by the fact that supplies are no longer available from Germany. The one great objection to increasing shipments is due to the scarcity of vessels and the high rate of freight, which in the present instance represents a value three times greater than the cargo.

Financial Department

Pond Creek Coal Co.

President T. B. Davis reports for the year ended Dec. 31, 1914, as follows:

The total production of coal for the year amounted to 690,653 tons, an increase of 160,104 tons over 1913. Although the company was only in its second year, it had been hoped that a larger production would be reached; but conditions arose which made this impossible. The coal produced finds an important market as a byproduct coking coal, and consequently is, to a considerable extent, dependent upon conditions in the steel industry.

After the first few months of the year, when the company did not earn its bond interest, earnings improved, so that for several months fairly substantial profits above interest were being made until the severe depression of business in the fall occurred, curtailing the output to an extent that made it impossible to earn the bond interest. We have every confidence that with an increase in the output, which is to be looked for on a return of better conditions, the company will earn substantial profits above charges.

Net additions to capital account, amounting to $158,004, were made during the year, and these cover principally the cost of completing tenement houses of which the company now owns 629, the cost of completing 15 better class houses, 4 store buildings, and other expenditures. The equipment additions cover principally the cost of 6 mining machines, 14 gathering locomotives, 350 steel mine cars, 2 refrigerating machines for the stores, etc. No depreciation has been set aside this year. When the development of the property is further advanced, this matter will be carefully considered, with a view to fixing a rate which will be sufficient to cover the depreciation on your plants.

INCOME ACCOUNT FOR YEAR ENDING DEC. 31, 1914

Gross earnings	$104,137	Gross income	$100,544
Net earnings	80,497	Bond interest	120,000
Other income	20,047	Balance, deficit, for year	19,456

BALANCE SHEET DEC. 31

Assets	1914	1913	Liabilities	1914	1913
Real estate	$997,145	$1,001,508	Stock	$2,000,000	$2,000,000
Construction, etc.	1,702,802	2,050,303	Share premium account	250,000	250,000
Equipment	505,846	.....			
Cash	702,440	1,018,484	1st M. conv. bonds	2,000,000	2,000,000
Prepaid insur., etc.	18,485	......	Accounts payable	31,578	115,064
Accounts receivable	97,184	99,532	Accrued pay-roll	8,699	18,580
Inventories, etc.	260,965	241,914	Drafts in transit, etc.	12,046	17,917
Profit and Loss, def.	19,456	......	Funds and reserves	2,000	10,180
Total	4,304,323	4,411,741	Total	4,304,323	4,411,741

Note—For previous annual report of this company, see Vol. 6, pp. 656, 934.

Island Creek Coal Co.

Pres. Thos. B. Davis, reports for the year ended Dec. 31, 1914, as follows:

Our production during 1914 amounted to 2,207,444 tons, an increase of 291,344 tons over 1913. Market conditions were not altogether satisfactory at any time of the year, and especially during the last half, when, due to the war in Europe, business generally was, as a matter of course, considerably unsettled, a reaction unfavorable to the coal business set in, which doubtless reduced the total amount of coal that otherwise would have been produced at your properties. In spite, however, of existing conditions, the net profits increased by $193,808 to a total of $823,481, the highest amount yet reached.

In order to increase our production, it was decided to open up two new mines, Nos. 11 and 12, on Main Island Creek. To provide power for these new mines, and also to allow of a greater production at certain of the other mines now in operation, it became necessary to make additions to the power system. These additions now completed, include two 400-hp boilers, a 1000-kw. turbo generator set and auxiliary equipment, two 600-kw. sub-stations and equipment, 500 steel mine cars, eight 6-ton gathering locomotives, over two miles of railroad sidings for the new mines, two steel tipples and equipment, 23 complete and 15 partially completed dwelling houses, store building, mining machines, etc.

To improve our river plant at Sekitan, Ohio, a large part of the old plant was replaced by a new plant which will have greater capacity than the old equipment, and very much improved facilities, together with additions to the dry docks and floating equipment. The total amount of all expenditures capitalized, after deduction of the cost of structures replaced by new works and charged to depreciation fund, amounted to $376,550. Additions were made to the depreciation fund on the same liberal basis as previously, and a large amount was charged against the depreciation fund, representing additions and betterments, which it was thought desirable not to capitalize, such as new steel mine cars, to replace wooden cars, reconstruction of a number of mine cars, storage tracks in the mines, two steel bridges, strengthening trestle, etc. Depreciation and reserve funds have decreased by $50,511, due to the large amounts charged against these funds as above mentioned, which exceeded the additions thereto.

Dividends on the preferred stock at the rate of $6 per share per year and ordinary dividends on common stock at the rate of $2 per share per year, as well as an extra dividend on the common stock of $3 per share, were paid during the year 1914. The extra dividend is a distribution of accumulated surplus.

CONSOLIDATED EARNINGS STATEMENT YEARS ENDING DEC. 31

	1914	1913	1912
Net earnings	$1,008,388	$800,448	$811,048
Reserve for exting. and depreciation	119,672	106,047	95,357
Net profits	$888,716	$694,401	$715,691
Administration and general expenses	69,480	70,392	57,253
Balance	$819,236	$624,009	$658,438
Add—Int. on bank deposits, etc	4,245	5,663	18,694
Total net profits	$823,481	$629,672	$677,132
Preferred dividends	$298,872	$298,754	$298,659
Common dividends	562,711	530,943	401,280
Balance deficit	$38,102	$200,025	$22,807

CONSOLIDATED BALANCE SHEET DEC. 31 (INCL. SUBSIDIARIES)

Assets—	1914	1913	Liabilities	1914	1913
Property account	$5,470,791	$5,094,241	Stock (not par—see below)	x$4,502,355	$4,493,974
Bond redemption fund	....	3,150	Cap. stk. of U. S. C. & Oil Co. not held	13,125	15,325
Cash	364,399	731,787			
Accounts receivable	399,330	426,504	Def. pay'ts on prop.	87,609	101,125
Coal in transit and in storage	525,450	299,421	Current liabilities	y183,229	150,274
Materials and supplies	254,658	210,000	Dividend paid Jan. 1	74,727	74,691
Unexpired insurance, prem. paid, taxes, etc.	24,669	32,771	Premium on shares of com. stock	905,520	602,651
			Deprec., etc., funds	459,874	510,385
			Undiv. sur. (sub. cos.) z	2,164	1,653
			Surplus	810,694	848,796
Total	7,039,297	6,797,874	Total	7,039,297	6,797,874

x Includes 49,820 15-18 shares pref. and 99,641 12-18 shares common stock issued in exchange for 179,355 shares of stock of U. S. Coal & Oil Co. par value of which is $4,483,875, and 18,480 shares common issued for cash, par value $18,480; total, $4,502,355.

y Current liabilities include accounts payable, $115,261; accrued pay-rolls, $16,580; drafts in transit, $24,392; accrued taxes, $26,995.

z Applicable to stocks not held by the Island Creek Coal Co.

Note—For previous annual report of this company see Vol. 6, p. 252.

Delaware, Lackawanna and Western

The annual report for the year ended Dec. 31, 1914, says:

Our coal mining operations resulted in producing 9,050,076 tons of coal from collieries and washeries, or 206,013 tons more than in any previous year.

Extraordinary expenditures aggregated $778,553, notably $285,959 for development of the new Loomis Colliery and $121,864 for opening up and developing of new Laurel Run property. These developments should, by the latter part of 1915, turn out a substantial tonnage each, and when completed will add largely to our total capacity of production. The further development of the Truesdale Colliery by the introduction of electrical and other machinery, pumps, etc., required a large expenditure, viz.: $124,402; this colliery is now the largest single producer in the anthracite fields, its tonnage last year amounting to 1,152,100 tons.

COAL AGE

Vol. 8 NEW YORK, NOVEMBER 20, 1915 No. 21

A Word About Our Wives

The women of our mining camps are slowly but surely coming into their own.

IT'S a long jump from the daily bath that the average coal digger used to take in his kitchen (using a tub filled with water heated by his wife on the family cookstove, the water being carried to the house a block or two by her from the nearest hydrant or well) to the daily bath that the miner now gets in a modern bathhouse a few steps away from the pit mouth, but some distance from home. The one who appreciates the change most and yet was never consulted in the matter is the same wife who once upon a time carried the water to fill the family tub.

And it's a still longer jump from the leaky, ramshackle shanties of yesterday to the neat, convenient dwellings of many mining camps today, and here again only the wives realize the completeness of the change.

The miner underground at his working face has no need to worry about the rain that laughs at the leaky roof on his dwelling, and if perchance it should rain when he is home at night, he is more than apt to be so sleepy that he will forget the unpleasantness before morning.

Likewise the patches of paint, still clinging desperately to his dwelling as a sort of reminder of a coat of paint that has long since outlived its usefulness, make no impression upon him, largely because he sees them only on Sundays and holidays, and at such times the daylight paints everything for him in colors of gold and silver. But the women—they have been driven to despair by the leaky roofs and have felt disgraced by the forbidding exteriors so long that the sightly houses now available with modern conveniences seem like dream homes.

It seems strange that in the past the wives, sisters and mothers in the mining camps should have received so little consideration from the operators. Pinning ourselves down to actual facts, the women don't get any too much consideration at the present time. Many of the improvements that are now so conspicuous have been adopted because the men seemed to demand them—not for their wives, but for themselves.

And getting back to actual facts, it is doubtful if there is a class of women in the world today who have a harder life, and have as few pleasures and more chances to suffer from great disasters than the wives of our coal-mining men.

It is also doubtful if there are many women in the world today, taking them en masse, who raise larger families; for that reason they deserve every possible consideration from the industry that has crying need for their sons.

If you think we exaggerate the indifferent treatment extended to our women, get out all of the articles you have read and recall all of the discussions you have heard and see if the word woman is mentioned frequently.

A New Method of Putting in Survey Stations

By H. C. Austin*

SYNOPSIS—Although sight stations are frequently placed on entry timbers, they are less liable to damage if placed directly in the roof. For drilling holes for the plugs to hold the sight spads, a Yankee drill may be used to advantage.

For some time I have been seeking a convenient, accurate and rapid means of installing survey stations, especially for entry and room sights in coal mines. I recently adopted a method which I believe fills the requirements completely. This method may be in use by others, but as I have never seen any description of it, it occurred to me that it might solve a rather vexing problem for others.

Under ordinary conditions, at least in Iowa, the entry timbering is from 100 to 300 ft. and often farther from the face of the entry. This condition applies especially to entries on which rooms are being turned by others than the entrymen, and the first few shots play havoc with the entry timbers. Furthermore, when the coal is not of sufficient height to permit of the entry being timbered without brushing, it is the custom to keep the timbering back until a sufficient amount of the roof has fallen to secure the necessary height.

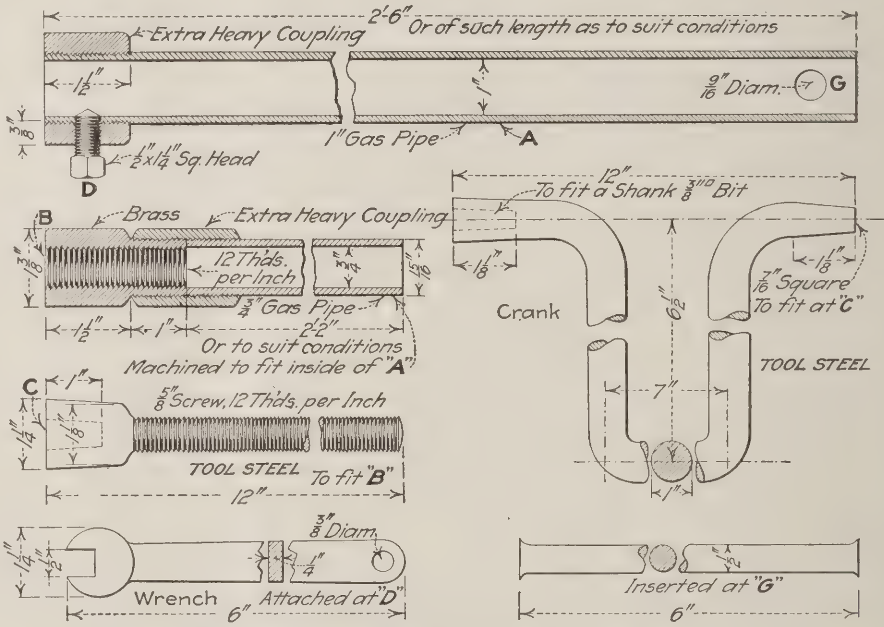
I rather favor survey stations in the roof in preference to placing them on collars or crossbars. However, it is preferable to have them so placed that the station is close to a crossbar for convenience in marking and as a protection against the roof loosening, and thus rendering the station useless.

I use such stations at which sights have been placed for permanent survey stations when they have not been destroyed, before the entries have been timbered. The timbermen are therefore instructed to place the crossbars near but not covering the station. The objection to placing permanent stations on crossbars is because these bars are often slightly moved by wrecks in the entry or from the timbermen happening to drive a piece of lagging after the stations are installed. This condition opens a grave source of error to the surveyor, without a ready means of detecting its existence. A station in the roof, on the other hand, should be free from such sources of error. In case the roof should have loosened any dislocation can be detected by taking the precaution to sound the roof before using the station.

Naturally squeezes or large movements are not taken into account here, for these movements usually make themselves known otherwise. It has been my experience that when entry sights are kept comparatively close to the working face they are used oftener than when farther back. It is easier for a man to take his sights when they are close to the face.

I have also found sight spads dug out of the roof for no other reason than that they were too far from the face, the entryman knowing that when the sights were removed they would be replaced nearer to the face. This condition, coupled with the fact that the roof is usually slabbing off when not timbered, makes a constant repetition of putting up sights, and hence the advantage of finding a ready and rapid means of performing this operation.

One method often used for this work is slow and unsatisfactory. A hole is made in the roof with a miner's pick, a plug driven therein and a spad placed in the plug. This method consumes much time, not only to dig the holes and make the plugs to fit them, but the plugs, which never fit the holes securely, either shrink from drying and fall out or swell and push themselves out, and the work has to be done over again. It takes from 10 to 15 min. to put in a pair of sights in this manner.



MACHINE FOR DRILLING SPAD HOLES

Another method which I have used includes the use of a drilling machine, as illustrated. This method proved satisfactory in every way, except that the drill was somewhat awkward and heavy to carry around in the mine. It is, however, extremely simple, and may be made in any machine shop. The machine will bore a hole in the hardest shale roof quickly and with but little effort. The weight and strength of the drill may be varied to suit local conditions, although the one illustrated was found to be of sufficient strength to drill an exceptionally hard roof.

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*Consolidated Indiana Coal Co., Melcher, Iowa.

After locating the hole with the transit, the machine is set up and the part *B* drawn out until the bit comes in contact with the roof, when the setscrew *D* is tightened and the hole drilled from 2 to 3 in. deep. After taking the machine down, the plug and spad are driven. The plumb-bob is then inserted in the spad and brought into line by tapping with a hammer, either to the right or left as the case may be. Naturally the more care employed in locating the hole for the drill the less will the spad have to be moved.

At the present time I have abandoned this method for the one hereafter described, which is so simple, handy and satisfactory that it would seem that it should have come into general use long ago. Instead of using the machine illustrated, I now drill the holes for the plugs with a Yankee drill, with which type of boring machine almost everyone is familiar. It is a spring drill in that by pushing on the handle a screw revolves the bit, the return of the handle being accomplished by a concealed coil spring. The drilling may consequently be done with one hand.

Other types or varieties of these or similar drills might, however, be more convenient than the one which I employ. The maximum size of bit ordinarily furnished with these drills is $^{11}/_{64}$ in. However, I have adopted a ¼-in. bit to fit the drill, and while it seems a trifle large for this type of machine, yet it works satisfactorily in the shale roof of the local mines. There was no particular reason for adopting the larger bit except the fact that we ran out of the small size, and it became necessary to use a larger bit until we could be supplied with the regular size.

The fact of the plugs being smaller than those used with the outfit shown in the illustrations limits the lateral movement of the spad, yet I have experienced no trouble in having to redrill holes. The less a spad may be moved after being driven the better, as any movement tends to loosen it in the plug and might be the cause of error later. However, with the small $^{11}/_{64}$-in. drill, a Keuffel & Esser spad will almost fill the hole, and anything but the slightest lateral movement will drive the spad against the side of the hole, bending it before loosening it appreciably.

With an experienced helper, I should judge that at least 75 per cent. of the spads placed need not be moved more than the width of a plumb-bob string to be on line. When the roof can be seen from the last station, a sight may be taken on the drill held to the roof, and when this is in the proper place, drilling can be commenced.

This drill is exceedingly handy when the roof is high, as a hole may be made as far up as one can reach with one hand. It only takes a few seconds to drill a hole, and it is an easy matter to extend a pair of sights between trips of the driver. The drill is small and light and may be easily carried in the pocket. The plugs are also small, and a pocketful will last a day or more. They may also be made with a knife by the helper while the instrument is being set up.

Under ordinary conditions it takes longer to set up the instrument than to drill the two holes and complete the work for the sights. Of course the speed of drilling depends somewhat on the roof, but a hole may be made in a brick with one of these drills, although this is quite hard on the bit. A soft top, which is inclined to stick to the bit, is somewhat bothersome, although it is possible that a special bit with more clearance back of the point would help in this kind of roof.

It is quite possible that roof conditions may be encountered which would make recourse to the heavier machine shown in the drawing necessary. Several of my personal friends have, however, been using a drill of this kind or one similar to it for some time and are quite enthusiastic in its praise. This is my excuse for attempting to enlighten the mine-surveying fraternity on what my friends term "a good thing."

⁂

Unreasonable Increases in the Anthracite Taxes

According to statistics compiled by the Bureau of Railway Economics at Washington, the taxes paid by the railroads of the United States have increased in the ten years between 1905 to 1914 inclusive from $63,474,679 to $150,371,000, or 137 per cent. The taxes paid by the roads classed as anthracite carriers showed an increase from $5,590,214 to $17,226,144, or 208.15 per cent. Thus the anthracite carriers had their rate of taxation increased 50 per cent. more than did the average railroad in the United States. In this connection it is interesting to note to what extent the taxes paid by the anthracite-mining companies have been increased.

The Anthracite Bureau of Information at Wilkes-Barre has been compiling some statistics of this kind, and while the information is not complete, enough has been obtained to show some rather striking comparisons. Companies producing 20 per cent. of the total anthracite output in 1914 paid $403,227 in taxes in 1904 and $1,035,032 in 1910, an increase of more than 150 per cent. in six years. If the 2½-per cent. valuation tax had been upheld by the State Supreme Court, the taxes for the same companies would have amounted in 1914 to $2,616,067, or nearly six and one-half times the amount paid in 1904. Upon the same basis the total taxes payable by all the anthracite companies in 1914 would have amounted to over $13,000,000 or about 7 per cent. of the value of the 81,000,000 tons produced that year.

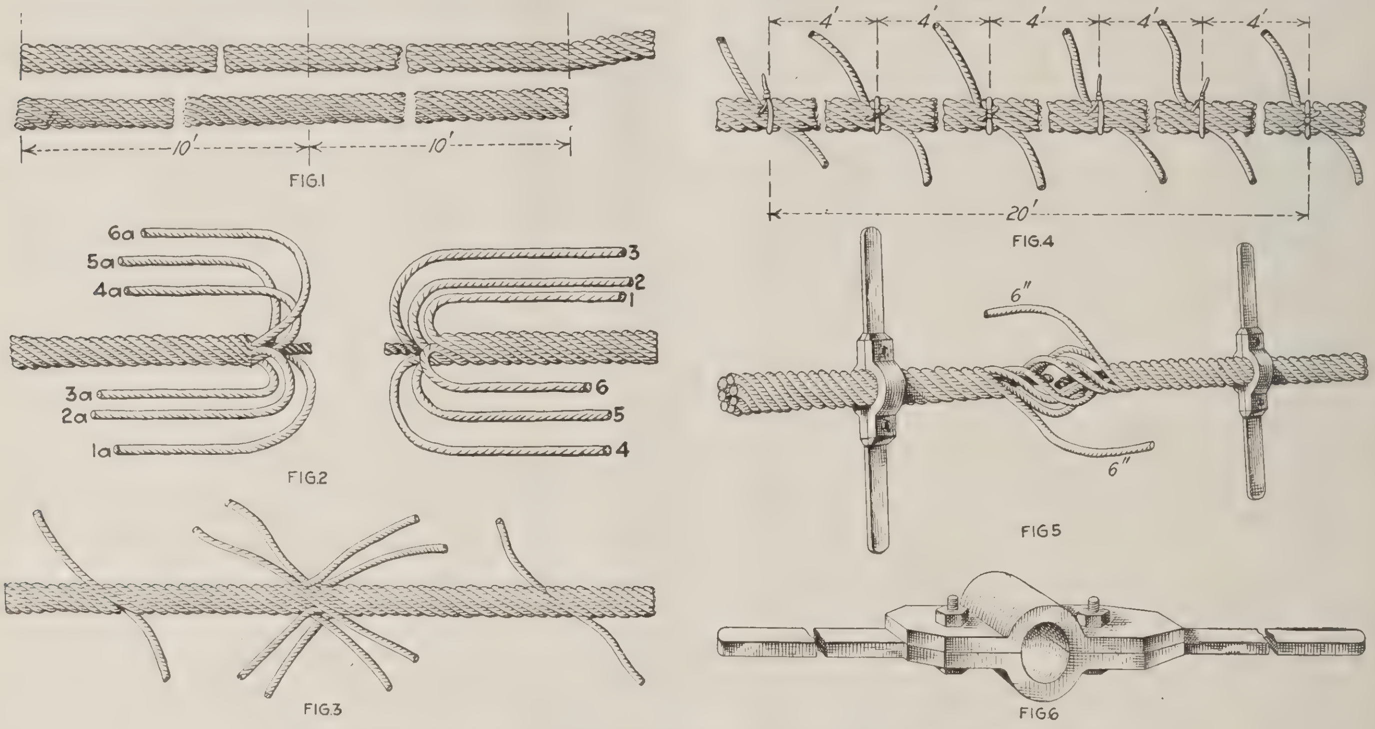
It is to be noted that these taxes for 1914 (if the 2½-per cent. valuation tax had held) would have shown an increase of more than 150 per cent. over 1910. The $13,000,000 of taxes would be at the rate of about 25c. a ton on all of the domestic sizes of anthracite produced in that year.

Another interesting thing to note in connection with the mysteries of taxation in the anthracite region is that, notwithstanding the depletion of the coal beds by the extraction of the coal, the assessment values of the properties are constantly appreciating. From 1907 to and including 1914 over 600,000,000 tons of anthracite have been mined, and yet according to the tax assessors some of the properties have doubled in value. The same companies that reported the increase in taxes show an appreciation of assessed valuation of their properties from $41,200,000 to $92,163,000. In most of the anthracite-producing counties more than 75 per cent. of the taxes are paid by the mining companies, and in one township of Luzerne County 98 per cent. of the total taxes are paid by two companies. There is one small leasehold, also in Luzerne County, from which the owners of the land receive in royalty a return which is barely enough to pay the taxes which are assessed on the property.

How To Splice Wire Rope

By C. J. Fuetter*

It is often the case where wire rope is used that in case of a breakdown no man can be found on the job who can splice the severed ends, and naturally there is much time lost in securing some outside man to do the work. Splicing a rope is generally regarded as a mysterious process whereas almost anyone can learn in a few hours how to do it. The accompanying illustrations show how a substantial wire-rope splice may be effected with ease and rapidity.



THE SUCCESSIVE STEPS IN ROPE SPLICING AND THE CLAMPS EMPLOYED

A hammer and a cold chisel for cutting off ends of strands, a steel fid or marlinspike for separating strands, two clamps for untwisting the rope, a sharp pocket knife for cutting the hemp core and a wooden mallet are all the tools needed. When starting to splice, proceed in this order: First, lay the rope on the ground, with ends overlapping 20 ft., 10 ft. each way from the center, as shown in Fig. 1.

Second, unlay the strands of both ends of the rope for a distance of 10 ft., as shown in Fig. 2. Cut off the hemp cores close up on both sides and bring the strands together so that the opposite strands will interlock regularly with each other.

Third, unlay strand 1^a and follow up with strand 1 of the other end, laying it tightly in the open groove made by unwinding 1^a; make the twist of the strand agree exactly with the twist of the open groove. Proceed with this until all but 6 in. of strand 1 is laid in or until 1^a has become 20 ft. long, then cut off 1^a, leaving an end about 6 in. long.

Fourth, unlay strand 4 of the opposite end and follow with strand 4^a, laying it in the open groove as before, treating this as in the first case (see Fig. 3). Pursue the same course with 2^a and 2, stopping 4 ft. short of the first set. Next do this with 5 and 5^a, stopping as before, then with 3^a and 3, and last with 6 and 6^a. The strands are now all laid in with the ends 4 ft. apart, as shown in Fig. 4.

Fifth and last, the ends must be secured without enlarging the diameter of the rope. Take the two rope clamps, as shown in Fig. 6, and fasten them to the rope, as shown in Fig. 5. Twist them in opposite directions, thus opening the lay of the rope, as in Fig. 5. Next with a knife cut out the hemp core about 6 in. on each side. Straighten the ends and slip them into the place occupied by the core; then twist the clamps back, closing up the rope, and take out the slight inequality with the wooden mallet and a block of wood. Next shift the clamps and repeat the operation at the other five places, and the splice is made.

⁂

Damages for Breach of Coal-Sales Contract

By A. L. H. Street*

Legal phases of the rights of a contract purchaser of coal for resale on the seller's failure to deliver were treated by the Court of Appeals of Kentucky in the late case of Log Mountain Coal Co. vs. White Oak Coal Co., 174 Southwestern Reporter 721.

The plaintiff brought suit to recover the price of installments delivered to the defendant under a contract calling for sale of nut and slack coal deliverable throughout a specified year; and defendant interposed a counterclaim based upon plaintiff's failure to deliver all the fuel called for by the agreement. Judgment having been awarded on the counterclaim, the plaintiff took an appeal to the Court of Appeals, and that tribunal in reversing the judgment decided these points as being applicable to all such contracts:

Damages recoverable for breach of a contract to sell coal intended for resale are measurable by the excess of the market value of the coal, at the time and place fixed in the contract for delivery, above the agreed price. If there is no market for such fuel at the agreed place, the damages are to be assessed with reference to the market value at the nearest available market plus transportation charges.

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*Attorney, St. Paul, Minn.

When the seller knows that the fuel contracted for is intended for resale, his inexcusable failure to make delivery subjects him to liability to the buyer for profits lost on account of being prevented from making the resales. But the Court of Appeals holds that loss of profits cannot be considered as an element of damages recoverable where the buyer makes no effort to obtain fuel elsewhere to take the place of that contracted for, if other coal could reasonably be obtained at a price which would reduce the loss necessarily sustained on account of the breech. But the court holds that the buyer is merely bound to use ordinary diligence to minimize his damages by making purchases elsewhere and is not required to exhaust all *possibility* of buying the desired fuel elsewhere; and that other purchases need not be made when the price of fuel has so advanced that a substitute purchase would enhance the loss.

⁂

Steel Mine Timbering Costs

By R. B. Woodworth*

The cost of timbering per ton of coal produced or per linear foot of heading depends on a number of highly variable factors, regardless of whether the timbering is of wood or steel or any other material whatsoever. Chief among these considerations is the first cost of the material itself delivered at the mine or at the working place.

The economic theory which underlies the introduction of steel in substitution for wood in mine timbering is that whatever might be the relative first cost of the two materials delivered at the mines ready for erection, any advantage in the case of wood should be overcome by the durability of steel.

Conservatively estimated on the basis of its low maintenance cost, it is assumed in ordinary calculations that the mine owner and operator can on the average afford to pay about three times as much for his steel mine timbering delivered at the mine as he does for wood, and in the early stages of the substitution of steel for wood it was assumed that the steel would cost about two and one half times as much as a wood installation.

STEEL MAY BE FITTED EXACTLY TO STRUCTURAL NECESSITIES

Recent practice, however, indicates strongly that in the larger coal mining districts of the United States the difference in cost is not nearly so great, and also that there are other features to be taken into account, such as the small weight of the steel and its greater ease in erection. In some cases it has even been found, where transportation costs are not excessive, that the first cost of the steel timbering erected in place is equal to or but slightly more than the cost of a wooden installation of similar strength. It has also been found that it is possible to fit the steel exactly to the structural necessities, whereas it is impracticable in all cases to do so with wood. This circumstance eliminates an economic waste due to the use, for practical considerations, of larger sized sticks of wood than are really necessary.

TABLE 1. RELATIVE COST OF STEEL AND SAWED OAK AND PINE BEAMS DELIVERED UNDERGROUND AND ESTIMATED EXPENSE OF MAINTENANCE FOR 20 YEARS

Steel Beams

Span in Clear, Ft.	Length of Beam, Ft.	Depth in Inches and Shape of Section	Weight in Lb. per Ft.	Weight of Beam, Lb.	Size of Bearing Plates, In.	Weight of Bearing Plates, Lb.	Total Weight of Steel, Lb.	Safe Uniform Load, Lb.	Cost Delivered Underground @ $2 per Cwt.	Estimated Maintenance for 20 Years: Favorable Conditions	Estimated Maintenance for 20 Years: Unfavorable Conditions
16	18	10—I	25.0	450	5x½x12	17.0	467.0	16,280	$9.34	Paint 5 times @ $1.00 = $5.00	Paint 20 times @ $1.25 = $25·
12	14	8—I	18.0	252	4x½x12	13.6	265.6	12,640	5.31	Paint 5 times @ .90 = 4.50	Paint 20 times @ 1.15 = 23·
8	10	6—I	12.25	122.5	4x½x12	13.6	136.1	9,680	2.72	Paint 5 times @ .80 = 4.00	Paint 20 times @ 1.05 = 21·
14	16	6—H	23.8	380.8	6x½x12	20.4	401.2	11,460	8.02	Paint 5 times @ .90 = 4.50	Paint 20 times @ 1.15 = 23.
12	14	6—H	23.8	333.2	6x½x12	20.4	353.6	13,370	7.07	Paint 5 times @ .80 = 4.00	Paint 20 times @ 1.05 = 21.
14	16	4—H	13.6	217.6	4x½x12	13.6	231.2	4,070	4.62	Paint 5 times @ .85 = 4.25	Paint 20 times @ 1.10 = 22.
12	14	4—H	13.6	190.4	4x½x12	13.6	204.0	4,750	4.08	Paint 5 times @ .75 = 3.75	Paint 20 times @ 1.00 = 20.

Square Sawed White Oak Beams

Span in Clear, Ft.	Length of Beam, Ft.	Size of Beam, In.	Weight of Beam, Lb.	Feet, Board Measure	Safe Uniform Load, Lb.	Cost Delivered Underground @ $40. per M.	Estimated Maintenance for 20 Years: Favorable Conditions		Estimated Maintenance for 20 Years: Unfavorable Conditions	
16	18	11x14	885	231	16,470	$9.24	Renew 2 times $18.48 Labor $5.00 10.00	$28.48	Renew 6 times $55.44 Labor $5.00 30.00	$85.44
12	14	9x12	483	126	13,200	5.04	Renew 2 times 10.08 Labor 4.50 9.00	19.08	Renew 6 times 30.24 Labor 4.50 27.00	57.24
8	10	6x10	192	50	9,170	2.00	Renew 2 times 4.00 Labor 4.00 8.00	12.00	Renew 6 times 12.00 Labor 4.00 24.00	36.00
14	16	9x12	552	144	11,310	5.76	Renew 2 times 11.52 Labor 4.50 9.00	20.52	Renew 6 times 34.56 Labor 4.50 27.00	61.56
12	14	9x12	483	126	13,200	5.04	Renew 2 times 10.08 Labor 4.50 9.00	19.08	Renew 6 times 30.24 Labor 5.50 27.00	57.24
14	16	8x8	327	85	4,470	3.40	Renew 2 times 6.80 Labor 4.00 8.00	14.80	Renew 6 times 20.40 Labor 4.00 24.00	44.40
12	14	8x8	286	75	5,210	3.00	Renew 2 times 6.00 Labor 4.00 8.00	14.00	Renew 6 times 18.00 Labor 4.00 24.00	42.00

Square Sawed Beams. Longleaf Yellow Pine

Span in Clear, Ft.	Length of Beam, Ft.	Size of Beam, In.	Weight of Beam, Lb.	Feet, Board Measure	Safe Uniform Load, Lb.	Cost Delivered Underground @ $40. per M.	Estimated Maintenance for 20 Years: Favorable Conditions		Estimated Maintenance for 20 Years: Unfavorable Conditions	
16	18	9x14	693	189	15,920	$7.56	Renew 2 times $15.12 Labor $5.00 10.00	$25.12	Renew 6 times $45.36 Labor $5.00 30.00	$75.36
12	14	10x10	428	117	12,040	4.68	Renew 2 times 9.36 Labor 4.50 9.00	18.36	Renew 6 times 28.08 Labor 4.50 27.00	55.08
8	10	8x8	195	53	9,240	2.12	Renew 2 times 4.24 Labor 4.00 8.00	12.24	Renew 6 times 12.72 Labor 4.00 24.00	36.72
14	16	8x12	469	128	11,890	5.12	Renew 2 times 10.24 Labor 4.50 9.00	19.24	Renew 6 times 30.72 Labor 4.50 27.00	57.72
12	14	8x12	411	112	13,860	4.48	Renew 2 times 8.96 Labor 4.50 9.00	17.96	Renew 6 times 26.88 Labor 4.50 27.00	53.88
14	16	6x8	235	64	3,960	2.56	Renew 2 times 5.12 Labor 4.00 8.00	13.12	Renew 6 times 15.36 Labor 4.00 24.00	39.36
12	14	6x8	205	56	4,620	2.24	Renew 2 times 4.48 Labor 4.00 8.00	12.48	Renew 6 times 13.44 Labor 4 00 24.00	37.44

Figures based on bending stresses of 1100 lb. per sq.in. for white oak and 1300 lb. per sq.in. for longleaf yellow pine and 16,000 lb. per sq.in. for steel. Loads to be uniformly distributed over length of span.

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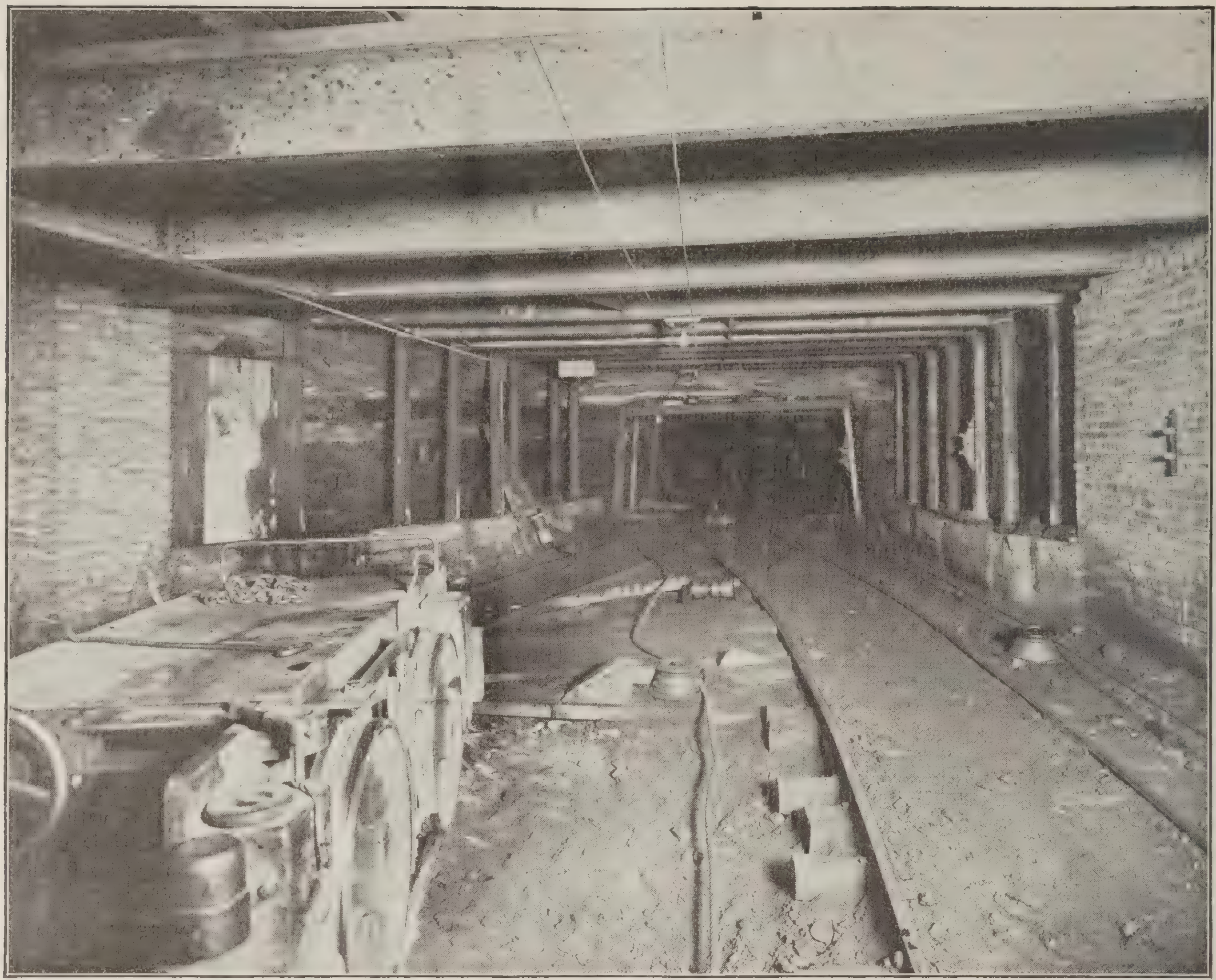
*Pittsburgh, Penn.



AN ACCEPTABLE AND SATISFACTORY TYPE OF STEEL TIMBERING OVER A SIDETRACK

Table 1 was prepared by a mining company in western Illinois and compares the relative cost of steel beam collars, square-sawed white oak beams and square-sawed yellow-pine beams delivered underground. It also estimates the comparative maintenance costs for a period of 20 years, based on the most favorable and the least favorable probable conditions. The safe working loads are based on the currently accepted values for the materials under bending stress.

TABLE 2. FIRST COST AND COST AT END OF 20 YEARS OF STEEL AND SAWED OAK AND PINE BEAMS

	Steel			White Oak			Longleaf Yellow Pine		
		20-Year Cost			20-Year Cost			20-Year Cost	
Span in Clear, Ft.	First Cost	Favorable Conditions	Unfavorable Conditions	First Cost	Favorable Conditions	Unfavorable Conditions	First Cost	Favorable Conditions	Unfavorable Conditions
16	$9.34	$14.34	$34.34	$9.24	$37.72	$94.68	$7.56	$32.68	$82.92
12	5.31	9.81	28.31	5.04	24.12	62.28	4.68	23.04	59.76
8	2.72	6.72	23.72	2.00	14.00	38.00	2.12	14.36	38.84
14	8.02	12.52	31.02	5.76	26.28	67.32	5.12	24.36	62.84
12	7.07	11.07	28.07	5.04	24.12	62.28	4.48	22.44	58.36
14	4.62	8.87	26.62	3.40	18.20	47.80	2.56	15.68	41.92
12	4.08	7.83	24.08	3.00	17.00	45.00	2.24	14.72	39.68

Table 2 states the first cost of such beams and their cost at the end of the 20-year period under the conditions assumed. It, therefore, represents what might be called a reasonable expectation of relative service in a particular district where the conditions as to transportation, cost of steel and the relative availability of wood are normal.

Examination of Table 2 will indicate that in the case of the 16-ft. spans there is but little difference in the first cost between steel and white oak, and that at the end of 20 years under any circumstance steel is the most economical.

This economical advantage of steel as compared with wood would be somewhat enhanced if consideration were had to the matter of interest on the investment, which, however, the mining company which prepared the table did not consider. It can also be said that repainting of steel once in 4 years is about the limit of probability. The writer knows of installations that have been in place two and three times as long as that without repainting, and it must not be forgotten that, except in special locations, conditions underground as regards paint are much better than they are above ground.

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Carbide Lamps Constructed of Copper should never be used, because such lamps are liable to explode. The Bureau of Mines recommends that the spent lime be placed in a dry, metallic can, having a lid with a vent, so that the waste material can be taken out of the mine at the end of the shift.

Calculation of Mine Gangway Timbers

By A. G. Morlock*

SYNOPSIS—Physical conditions affecting the size of timbers required in a mine are variable, and experience must largely govern this determination. There are, however, fixed principles relating to the strength of beams and posts that give valuable assistance in ascertaining what sizes of different kinds of timber or steel are adapted to give the necessary support to the roof in mine workings.

There seem to be no definite rules by which the size of mine-gangway timbers may be calculated. Experience largely governs their use and, as both experience and judgment differ widely, in many cases the timbers are either too small or too large for the work required of them. The compressive stress of timbers—wood or steel—is often neglected, resulting in economic waste.

Owing to the adjustment of stresses underground, it is impossible to calculate the loading of the timbers with mathematical accuracy; however, rules may be formulated that will give approximate results. The experienced miner knows the size of collar best adapted for certain conditions in the gangway, so that by taking an average of the strength of collars used in several different gangways we arrive at a value that may be used in calculating other gangway timbers.

Where the strata are horizontal or the dip is light the loads are applied normal to the collar, and produce therein bending stresses, while compressive stresses result in the legs, each leg taking one-half of the total load on the collar.

Where the dip of the strata is great, however, legs and collars may be subject to both bending and compressive stresses at the same time. The compressive stresses in the collars may safely be ignored, as they are taken care of in the average bending load that a collar will support, but the legs must be calculated for both bending and compression. This bending load per foot of length I will assume as being equal to that applied to the collar.

When the diameter and length of an existing collar are known the safe load per foot of length that it will support may be calculated by the formula

$$w = 0.065\, f \frac{d^3}{l^2} \qquad (1)$$

in which

w = Safe load per foot of length of span (lb.);

d = Least diameter of collar (in.);

l = Length of clear span (ft.);

f = Safe unit fiber stress (1,200 lb. per sq.in. of section, for long-leaf yellow pine and white oak, and 900 lb. per sq.in., for short-leaf yellow pine).

In calculating legs for compressive stresses only, the formula

$$f_c = \frac{L\,(700 + 15\,c + c^2)}{a\,(700 + 15\,c)} \qquad (2)$$

should be used, in which

L = Total load on leg (lb.);

a = Area of cross-section of leg (sq.in.);

c = Length of leg in inches, divided by its least diameter in inches.

The diameter of the leg must be assumed for trial, the most economical section being that in which the safe unit fiber stress is not exceeded.

Practical Examples

The following practical examples will show the correct method of using these formulas.

Example 1—What size legs would be required for a long-leaf yellow-pine timber set in a gangway 12 ft. wide, with clear headroom of 8 ft.; the strata being horizontal? Assume 2,000 lb. per lineal foot for load on collar.

Solution—$2{,}000 \times 12 = 24{,}000$ lb., total load on collar, and $24{,}000 \div 2 = 12{,}000$ lb., total load on each leg.

Assuming the least diameter of the leg to be 4⅜ in., the area of section is $0.7854\,(4\tfrac{3}{8})^2 = 15.03$ sq.in.; and $c = 8 \times 12 \div 4\tfrac{3}{8} = 21.94$, which substituted in Formula 2 gives for the compressive stress in the leg,

$$f_c = \frac{12{,}000\,(700 + 15 \times 21.94 + 21.94^2)}{15.03\,(700 + 15 \times 21.94)} = 1{,}172 \textit{ lb. per sq.in.}$$

Since 1,172 lb. is less than the unit stress for long-leaf yellow pine (1,200 lb.), a 4⅜-in. stick will support the load; however, in this case, it would be advisable to use a larger stick, say 8 in. diameter, to allow for defects in the wood and unforeseen bending stresses.

Example 2—Design a long-leaf yellow-pine timber set for a gangway 12 ft. wide, with a clear headroom of 8 ft., the strata having a dip of 45 deg. The writer has found 2,000 lb. per lineal foot of collar to be the average load in his locality where the dip of the strata is very heavy; so we will assume this value in solving the problem.

Solution—Reversing Formula 1, so as to give the value of d and substituting the values given for the load per lineal foot of collar, unit fiber stress and length of span, we have

$$d = \sqrt[3]{\frac{w l^2}{0.065\, f}} = \sqrt[3]{\frac{2{,}000 \times 12^2}{0.065 \times 1{,}200}} = 15.45, \textit{ say } 15\tfrac{1}{2} \textit{ in.}$$

The load producing compression in each leg is $24{,}000 \div 2 = 12{,}000$ lb. Assuming as before the same bending load for the leg, as for the collar $2{,}000 \times 8 = 16{,}000$ lb. bending load on each leg. Then, assuming 12½ in. as the least diameter of leg and solving for the allowable unit stress due to compression, we have by Formula 2, since $c = 8 \times 12 \div 12\tfrac{1}{2} = 7.68$.

$$\frac{L}{a} = \frac{f\,(700 + 15\,c)}{700 + 15\,c + c^2} = \frac{1{,}200\,(700 + 15 \times 7.68)}{700 + 15 \times 7.68 + 7.68^2} = 1{,}118.4 \textit{ lb. per sq.in.}$$

The unit stress due to bending, for a total load of 16,000 lb., as found above, is calculated by solving Formula 1 for f; thus,

$$f = \frac{w l^2}{0.065\, d^3} = \frac{2{,}000 \times 8^2}{0.065 \times 12.5^3} = 1{,}008.2 \textit{ lb. per sq.in.}$$

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*Lansford, Penn.

The unit stress due to compression is

$$f_c = \frac{L}{0.7854\,d^2} = \frac{12{,}000}{0.7854 \times 12.5^2} = 97.8 \textit{ lb.}$$

The total stress in the leg due to bending and compression is therefore

$$1{,}008.2 + 97.8 = 1{,}106 \textit{ lb. per sq.in.}$$

As the unit stress produced by the loads is thus shown to be nearly equal to but less than the allowable unit stress, a 12½-in. stick is the most economical section to use.

THE USE OF THE SECTION MODULUS

When calculating beams of special cross-section, as steel I-beams, it is customary to employ an expression called the "section modulus" of the beam. The section modulus (S) of a beam is a value that multiplied by the unit fiber stress (f) of the material gives the bending moment (M) of which such beam is capable of supporting, as expressed by the formula

$$M = fS \qquad (3)$$

But, for a beam uniformly loaded and supported at each end, the bending moment (M), in inch-pounds, is

$$M = \frac{12\,wl^2}{8} = 1.5\,wl^2 \qquad (4)$$

Combining equations 3 and 4 gives for the section modulus

$$S = 1.5\frac{wl^2}{f} \qquad (5)$$

Example 3—Design a steel timber set for a gangway 12 ft. wide, with a clear headroom of 8 ft., the strata having a heavy dip, assuming a fiber stress for steel, f = 16,000 lb. per sq.in.

Solution—The average load per lineal foot on the collar being assumed, as before, w = 2,000 lb. and the span being l = 12 ft., the required section modulus, in this case, is

$$S = 1.5\frac{wl^2}{f} = \frac{1.5 \times 2{,}000 \times 12^2}{16{,}000} = 27$$

Any one of the following sections, taken from steel manufacturers' handbooks, will be satisfactory: 8-in.-32.5-lb. Bethlehem girder beam, section modulus, 28.6; 8-in.-32-lb. Bethlehem H-column, section modulus 26.9; 10-in.-30-lb. standard I-beam, section modulus, 26.8. A 10-in.-30-lb. I-beam is the most economical section, but an H-beam, or girder beam, is to be preferred as it has a broader bearing surface.

Assuming the leg to be a 10-in.-25-lb. I-beam, which has an area a = 7.37 sq.in.; radius of gyration, r = 0.97; and section modulus, S = 24.4; using Gordon's formula for medium steel, fixed-end column and solving for ultimate strength (P), we have

$$P = \frac{50{,}000}{1 + \dfrac{(12\,L)^2}{36{,}000\,r^2}} = \frac{50{,}000}{1 + \dfrac{(12 \times 8)^2}{36{,}000 \times 0.97^2}} = 39{,}308 \textit{ lb.}$$

With a safety factor of 4, the safe unit stress is $\dfrac{39{,}308}{4} = 9{,}827$ lb.

Again, assuming the same unit bending load for the leg as for the collar, w = 2,000 lb. per lineal foot, and the length of the leg being l = 8 ft. the bending moment, applying Formula 4, is

$$M = 1.5\,wl^2 = 1.5 \times 2{,}000 \times 8^2 = 192{,}000 \textit{ in.-lb.}$$

This makes the unit fiber stress due to bending

$$f = \frac{M}{S} = \frac{192{,}000}{24.4} = 7{,}869 \textit{ lb. per sq.in.}$$

The unit stress due to compression, for a 12-ft. span, the sectional area of the leg being a = 7.37 sq.in. is

$$f_c = \frac{L}{a} = \frac{2{,}000 \times 12}{2 \times 7.37} = 1{,}628 \textit{ lb. per sq.in.},$$

which makes the total unit stress due to bending and compression

$$7{,}869 + 1{,}628 = 9{,}497 \textit{ lb. per sq.in.}$$

This actual stress in the leg is less than the safe stress, therefore a 10-in.-25-lb. I-beam will satisfy the conditions assumed in this case.

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German Post-Pulling Device

A German device which may be termed a post puller, although it differs from what is commonly understood in the United States by that name, is shown in the accompanying illustration. It is described in *Glückauf* by "Mining Assessor" Doctor Beissel, of Aachen.

The device constitutes essentially a joint or hinge in the post which may be released by pulling a rope, thus allowing the post to be buckled and brought down. The post is cut obliquely into two segments, so that it tends to slide apart under the rock pressure. The sliding action is resisted by friction and also by the mechanical joint. When the latter is loosened, the pulling apart of the post is an easy matter.

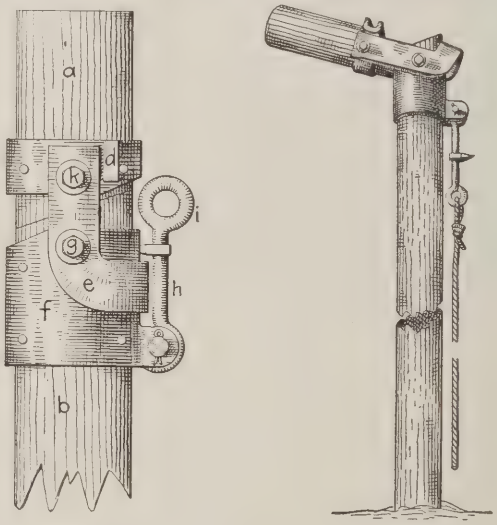

Fig. 1 Fig. 2

DETAILS AND OPERATION OF POST PULLER

In Fig. 1, *a* and *b* are the segments of the sawed post. The piece *a* carries a collar with lugs *d*. Against these rests a bell-crank lever *e*, which is pivoted at *g* to the collar *f* around the lower segment of the post. The hook or latch *h* with the rope eyelet *i* is pivoted at the bottom of the ring and carries a point which is driven into the post through a hole in the ring above the lower part of the lever *e*, thus holding this lever in position.

Thus when the latch *h* is pulled outward by the rope, the lever *e* is released. The lever *e* is loosely pivoted to the upper collar by the pin *k* to keep the upper and lower portions of the device from dropping apart when relaxed.

The post is pulled by a rope in the eyelet *i*. This releases the lever *e*, which turns on its pivot, relieves the pressure against the lugs *d* and permits the upper part of the post to slide off the lower.

These pullers have been given a long trial in seams about 7 ft. thick pitching 45 deg. They are put on the posts aboveground so that setting the timber in the mine takes only the usual time. In order to allow the proper amount of friction at the joint, a post of 4-in. diameter should be sawed at 30 deg. and one of 7¼-in. at 38 deg. For various practical reasons it is better to make the joint near the top of the post.

Numerous advantages are claimed for this device. It is patented and its manufacture is in the hands of the Eschweiler Bergwerks-Verein, Eschweileraue, Germany.

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Extracts from a Superintendent's Diary

After being driven almost to desperation by repeated failure to devise a satisfactory dockage system, I believe I have hit upon a scheme at last that will fill the bill.

Reviewing the various dockage schemes that we have tried at different times, I became impressed with the fact that in none of them had we made an attempt to reward miners who were doing satisfactory work or even to show them that we appreciated their efforts. I recalled that in all lines of industry prizes and bonuses have become recognized as valuable aids, and I could think of no good reason why miner folk should not be susceptible to the same influences as other laboring men.

With that thought as a starting point, I worked up the plan which I have just put into effect.

I had in mind two things—first, recognition of good work, and then a suitable reward.

We have several foremen whose duty it is to wander about in the mines, keeping tab on the loaders to see that they load clean coal. These men are to be replaced with honor men chosen from the ranks of the miners. At the close of each two weeks' period we will select men who have made the best records for clean coal as shown by our slate reports during that period, and they will act as loading inspectors, showing the others just how the loading should be done; because of their record they can speak with authority. For this work we will pay them a rate twice as large as they earned as miners during the previous two weeks. They are thus granted recognition and suitable reward.

But we will not let the reward rest with that. We wanted to arrange the reward so that all of the men could profit by the improvement, and to accomplish this end we will divide with the men any increase in the value of our coal because of its better quality. In our case this is very easily determined. All of our small sizes have to be handled through a washer, and the washer loss is dependent entirely upon the amount of slate that the miner loads with his coal. If the records show that we have reduced the washer loss 200 tons during a two weeks' period, we will credit the men with one-half, or 100 tons, as a bonus, valuing it as washed coal.

Taking the average for the last 12 months, we found that the washer loss was 10 per cent. of the total tonnage handled by the washer, and we are to use that as the basis for determining how much improvement has been made.

I had a hard time getting our general manager to consent to a trial of the plan, as he was afraid of the precedent that might be established. Our local union committee finally agreed, however, that we might adopt the plan and let it remain in force during the unexpired term of our present contract, and then withdraw it entirely if we desired. They were largely governed by the fact that we were really not making a change in the contract price. This made it easier for our manager to give his consent.

According to my prediction, the quality of our coal will improve to a noticeable extent during the first few months and then reach a standard that will be hard to improve upon. The men will have learned by that time to live up to their increased income, and we will be able to supply the increased income by increasing the digging price in return for more liberal dockage rules; this will automatically rid us of all undesirables.

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Rapid Increase in Automobile Coal Trucks

As indicating the rapid change being made in the type of delivery equipment in use by the retail dealers, the credit departments of the various shippers report numerous inquiries from automobile concerns as to the standing of some of their customers. It is really remarkable in some of the larger cities to note the rapid increase in the use of automobiles for coal delivery. New trucks are seen on the streets almost hourly. Practically all of the wholesale houses, too, have outfitted their salesmen with runabouts.

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An Injunction Is Dissolved

By a decree of Judge Moser, of Sunbury, the preliminary injunction secured by the Kingston Coal Co. to restrain the Plymouth Coal Co. from stopping its fans and pumps at the abandoned Dodson colliery at Plymouth has been dissolved at the cost of the plaintiff. An opinion in the case is soon to follow.

Several months ago, after injunctions were secured by Plymouth Borough to restrain the Plymouth Coal Co. from further mining in order to safeguard the borough against a serious subsidence of the surface, the Plymouth Coal Co. abandoned its Dodson colliery. The Kingston Coal Co., which operates the Gaylord colliery adjoining, then secured a preliminary injunction to restrain the Plymouth Coal Co. from removing its pumps and stopping its fans, on the ground that water and gas would enter the Gaylord colliery through openings in a barrier pillar.

The Plymouth Coal Co. denied liability and responsibility for keeping its fans and pumps in operation after being compelled to abandon its colliery. The cost of running fans and pumps and the responsibility for cutting through the barrier pillar also entered into the case. The injunction was heard before Judge Moser, and after final hearing and arguments, the court directs that the preliminary injunction awarded Mar. 29, 1915, be dissolved.

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Railway Coal-Storage Plants

In our issue of Oct. 16, 1915, we republished an article entitled "Railway Coal-Storage Plants" from the pages of a contemporary. Roberts & Schaefer Co., of Chicago, write us saying that the coal-station machinery referred to on page 626 was not furnished by the Ogle Construction Co. as stated, but by the Roberts & Schaefer Co. The cranes were built as stated by the Link-Belt Co.

A Few "Dont's" for Motormen

By James Thomas Reynolds*

The unusual possibilities of danger to the life and limb of not only the young men who generally operate the motors underground, but through any careless act of theirs to every employee in the mine at times, are only too obvious to anyone whose work takes him into one mine, let alone many. These pernicious opportunities for man-injury and equipment-destruction are glaringly plentiful to those who have reason to look over many different mines in many different states.

A man whose work lies in one mine may see much he would have otherwise—motors run deliberately without regard to safety of costly material or even the lives of the motormen and snappers themselves. In traveling from one mine to another one sees so much done that should not be done, so much omitted that ought not to be omitted and so much faulty operation through bad mining conditions as well as bad practices on the part of the operatives that the wonder is, not that so many lives are lost through this cause or causes and so many men are injured, but that the result is not worse.

The intent of the following suggestions, however, is not to fully cover this entire subject, which of course takes in not only the carelessness incidental to the men themselves whose duty is to run the underground motors, but the conditions of the roadways, tracks, etc., over which they are compelled to operate. These conditions vary as the mines themselves vary—more's the pity! Uniformity of action and care is fortunately possible to the personnel, and it is directly to the latter that I address a few "dont's" which may easily be memorized by the motorman and helper who have a tendency to thoughtlessness while working.

Trusting these may be the indirect means somewhere of saving a life or saving someone from injury, I append them as jotted down in my notebook, without effort at logical sequence:

Don't forget that safety is your first consideration.

Don't allow anyone except those authorized by the mine foreman to ride on your trip or motor. Injury or death may result therefrom, in which case remember that YOU would be held responsible.

Don't leave your trip where it will obstruct the passage of air if this can possibly be avoided (and it generally can by a little more care and effort), and don't open a door to pass your trip through without closing it; for, failing in either of these precautions, you may, particularly if the mine is gassy, cause by such apparently trivial action your own death as well as that of all in the mine.

Don't hurry to gain five minutes and by so doing lose an hour; it's a poor "gain" on the cost sheet.

Don't use abusive language to the foreign miners who at first fail to understand you. Without the miner there is neither work nor pay for the motorman. Remember that if they can't speak your language you have nothing on them in that; it is 10 to 1 that you cannot speak theirs.

Don't allow your trip to get beyond control, but if this contingency arises, keep a cool head. This sometimes plays a great part in getting out of a bad mess with a whole hide.

Don't allow any unauthorized person to handle the controlling parts of your motor; accidents and loss of life have sometimes resulted from the motorman's indifference to this precaution.

Don't fail to report any bad track immediately to the proper roadman, and if this fails of result, to the foreman. Remember, a penny spike in time may save the company a costly motor and you your health or life itself.

Don't get reckless and "pull her wide open" when matters don't seem to be going smoothly. The greatest day's run isn't always to the daredevil motorman's credit; he's too apt to get into a smashup just when he thinks he has the record clinched. Moreover, it is better for the company and you to go steady and be safe a thousand times than fast and injured once.

Don't forget to oil your motor when required.

Don't pull cars back over frogs and through switches to replace them on the track. You are not putting yourself in good standing with the company or the foreman by saving ten minutes' time and destroying $10 worth of cars, motor and roadway. The firm has supplied you with climbers with which to replace cars.

Don't forget that the motor boss is paid by the company to give you orders. These may not always be to your liking, but remember he's paid to command and you to obey, and it's useless to take your "revenge" by leaving the trip standing and quitting without notice, thinking the plant will have to shut down. It won't. I know, because I've tried it.

And when you think you must take an unnecessary chance with your life, even if you forget yourself, don't fail to remember those at home.

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*Mine-safety inspector, Aetna Life Insurance Co., Houston, Penn.

Cause Unknown

By R. T. Strohm

The miner, as he left his job,
Cleaned out his soothing brier;
The ashes fell among the gob
And set the stuff afire.
The owners wagged their heads—and jaws;
They spouted threat and fustian;
And then announced that ancient cause,
"Spontaneous combustion."

He left some carbide when he quit,
The rules of safety spurning;
The moisture soon got into it
And started things to burning.
They sought the cause with might and main,
By quizzing and inspection,
But all their striving was in vain;
It still escaped detection.

A timber for his mine lamp made
A rather handy holder,
Until the flame, by currents swayed,
Had set the wood a-smolder;
And though the inquiry brought out
A world of elocution,
The problem still was left in doubt;
It quite defied solution.

He threw a wornout wick aside,
All thought of risk disclaiming;
It fell on timber old and dried,
And later set it flaming.
From lip to ear wild guesses sped,
And theories flew faster,
But this is what the verdict read:
"*Mysterious disaster.*"

Barometric Condenser Drain

By H. R. Bissell*

SYNOPSIS—A practical method of draining a water pocket in piping carrying steam under 28 in. of vacuum is here described.

Fig. 1 shows the 24-in. exhaust piping from a 500-kw. turbine to the surface condenser installed at the central power station of the Century Coal Co., at Century, W. Va. This condenser operates under 28-in. vacuum referred to a 30-in. barometer, or practically 1 lb. absolute pressure.

The turbine exhausts downward, and the steam, after passing through the gate valve, must rise about 10 ft. to the inlet of the condenser. Water collects in the lower part of this 24-in. line owing to two causes—first, there is a partial condensation of the exhaust steam before reaching the condenser, and second, at this plant the steam is at times very wet and occasionally even slugs of water come over from the boilers. These of course collect in the 24-in. line after passing through the turbine.

While without question some of this water is carried up into the condenser by the high velocity of the exhaust steam, still a safe and satisfactory operation of the turbine required some method of removing this water promptly and automatically. As originally installed there was a 2-in. drip line from the lowest part of the 24-in. pipe to a small pump and hotwell, a float in the latter actuating the steam-inlet valve to the pump.

This arrangement was not satisfactory because of the fact that local conditions prevented the pump being placed at such a depth as would give the inlet water to the pump sufficient head for the automatic controlling of the pump at variable speeds by the float in the hotwell. This was an important point in order to take care of slugs of water coming over from the boilers.

To make this point clearer, the float would control the pump when the condensate was collecting in small quantities; but with a sudden increase in the condensate, the float would open wide the steam-inlet valve, and with the low head of water there would not be sufficient pressure to force the water into the pump at its increased speed, causing it to race. It was therefore necessary to throttle down the pump to make it operate, and under such condition it would not automatically remove sudden increases in the condensate.

It should be borne in mind that the problem was to remove water from the 24-in. line which was under 28-in. vacuum and that, instead of 14.7 lb. atmospheric pressure to force water into the pump, there was a maximum of 1-lb. pressure, depending of course upon the condition of the pump.

The Original Plan Included Three Valves

The original theoretical plan for removing the water by a barometric drain is shown in Fig. 2. A 2-in. pipe line with three valves was run from the 24-in. exhaust to the hoisting shaft of the mine, a distance of 130 ft., with a minimum downgrade of 1¼ per cent., then down the shaft 34 ft. and turned upward. For convenience the barometer can be considered as being 30 in. and the vacuum in the condenser as 28 in., inasmuch as any change in the barometer is accompanied by a corresponding change in the absolute pressure of the condenser.

The proposed operation was as follows: Suppose valves *A, B* and *C* to be closed and the line included between them to be full of water. Upon opening valve *C,* the water would run down and out until it left a column 34 ft. high, balanced by atmospheric pressure. Above the water there would be a practical vacuum. Next suppose the condenser to be brought up to 28-in. vacuum, or 1-lb. absolute pressure. Should valve *A* now be opened, there would be 1-lb. pressure, forcing the water toward the shaft; and this pressure being sufficient to lift water 2 ft., the proposition would work theoretically if the 2-in. line rose 2 ft. instead of slanting downward this amount. However, the line being entirely downgrade, the 1-lb. pressure would lower the barometric column to 32 ft., and as water entered above, a corresponding amount would overflow at the bottom to maintain that height of column.

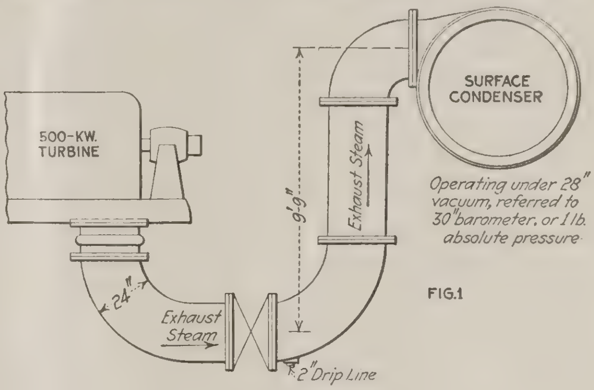
500-KW. TURBINE
SURFACE CONDENSER
Exhaust Steam
9'-6"
24"
Exhaust Steam
2" Drip Line
Operating under 28" vacuum, referred to 30" barometer, or 1 lb. absolute pressure

FIG. 1

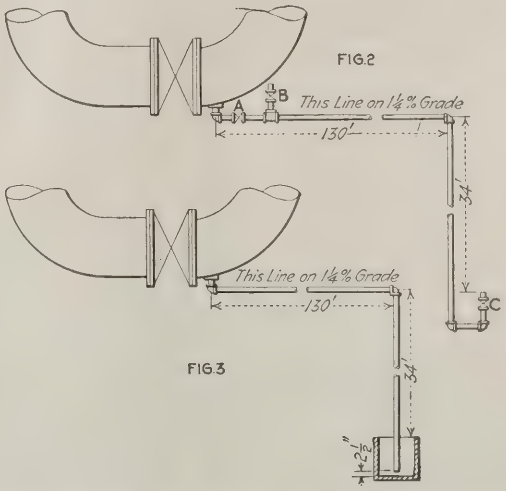

FIG. 2

FIG. 3

ARRANGEMENT OF DRAIN ON TURBINE EXHAUST PIPING

When ready to shut down, valve *A* should be closed, after which the condenser could be stopped and the column of water would be left suspended in the mine shaft overnight. The purpose of the valve *B* was to prime the line after closing the valve *C,* in the event of the water column being lost while the turbine was idle, by air leaking through the valve *A.*

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*Mining engineer, Century, W. Va.

This proposition depended upon air-tight valves, and there is no question but that the more practical plan is as shown in Fig. 3. This has been successfully installed and is far more efficient, and in addition is entirely automatic.

As noted in Fig. 3 a line similar to that shown in Fig. 2 was laid, except that there are no valves and the lower end of the 2-in. line extends down into a wooden tank, 15x15 in. and 16½ in. deep, affording ample capacity for water to seal the end of the drip line at all times.

Absolutely no attention to this line is required. When the condenser is started, atmospheric pressure forces water up the column a distance of 13.6 times the inches of vacuum in the condenser (for 28 in., 31.7 ft.), and an interesting test can be made by checking the amount of water displaced in the tank with the volume of water figured to be in the column. Since the absolute pressure in the 2-in. line above the water column is the same as in the condenser and since water will seek its level, whether under 100-lb. pressure, atmospheric pressure or under vacuum, as condensation collects in the 24-in. turbine exhaust it runs down the 2-in. line to the water column in the shaft, and a corresponding amount overflows the tank, so that the barometric column maintains the same height, according to the barometer and the degree of vacuum maintained in the condenser.

It will be noted in Fig. 3 that the 2-in. drip line extends within 2½ in. of the bottom of the wooden tank. What would be the result should the level of the water in the tank for any reason recede below the bottom of the 2-in. drip line while the condenser is in operation? While it is well known that atmospheric pressure will not lift water higher than as already explained, still the column of water in such a case will be carried up into the 24-in. line by the velocity of the air going up through the 2-in. pipe. As the top of the water column is approached, the pressure existing therein decreases and the speed at which this column is carried upward by the air gradually rises, as the air after entering at the lower end reaches points of lower pressure and expands, until all the water in the column has been discharged into the 24-in. pipe.

An additional point which I wish to bring out is that by a "whirlpool" effect the entire 2½ in. of water in the tank below the column has been swept up the 2-in. line by the velocity of the air being forced up this pipe. The vacuum in the condenser was of course destroyed.

Canary Is Not a Safe Test of Deoxygenated Air

The resistiveness of a canary bird to oxygen deficiency has been demonstrated during two explorations of a mine-fire area by the apparatus crew of the Bureau of Mines from the Pittsburgh station. Duplicate air samples that were collected during the first exploration at a point 1,000 ft. from the fresh-air base showed on analysis only 6 and 7 per cent. oxygen respectively, yet the canary bird was apparently not affected. The safety lamps were extinguished, however, before the apparatus crew advanced to the point where these samples were collected.

On the second exploration, to a point 2,000 ft. from the fresh-air base, one air sample showed only 2 per cent. oxygen, and the canary was of course overcome long before this point was reached. However, the bird was carried back at once to the point where the analysis had shown 7 per cent. oxygen, and when the apparatus party returned in 20 min. they were surprised to find that the canary had revived in that atmosphere. All the analyses were made with an Orsat apparatus at the fresh-air

SCOTT COLLIERY OF THE SUSQUEHANNA COAL CO. AT SHAMOKIN, PENN. THE BOILER HOUSE IS EQUIPPED base inside the mine. The atmosphere contained practically no carbon monoxide, as the analyses show:

	Sample No. 1	Sample No. 2
Carbon dioxide, CO_2	2.6%	2.5%
Oxygen, O_2	7.4%	6.0%
Carbon monoxide, CO	trace	trace
Methane, CH_4	14.6%	16.8%

This fire area had been sealed off for 11 months. The apparatus explorations showed that no fire existed, and the mine was successfully reopened. This demonstration of the ability of the canary bird to live in an atmosphere so low in oxygen as to be fatal to human life is most important. It demonstrates that it is absolutely needful to *carry a safety lamp to test for oxygen deficiency.* The canary may be used to indicate the presence of carbon monoxide, but that is all. Every rescueman must keep this in mind and not say that "I am willing to go anywhere where the canary survives."

Use of Liquid Air for Blasting by a New Process*

The first experiment with liquid air as an explosive dates back nearly to the beginning of its industrial production. Professor von Linde made an explosive called "Oxyliquit" by mixing liquid air with charcoal. This explosive broth, or paste, was put directly into the drill hole and fired by means of cartridges and fuses.

Since this primitive method gave unsatisfactory results, it was modified by filling a suitably prepared cardboard cylinder with an explosive substance, preferably by dipping the whole in liquid air. This method gave results, but was lacking in safety and depended on the skill of the workmen and quickness of manipulation. The trouble was due largely to the enormous difference in temperature between the liquid air and the surrounding rock, so that the air rapidly evaporated in the hole. The maximum theoretical life of a blasting cartridge was thus only 10 min., while in practice it was still shorter.

Interesting experiments have been made in France by Georges Claude, and other experiments which improve upon the von Linde method have been conducted in Charlottenburg, Germany, by Kowatsch, with the coöperation of von Baldus.

In order to prevent a rapid evaporation of the liquid air, Kowatsch puts the cartridge with the dry carbon container in the drill hole before introducing the liquid air and avoids the dangerous loss of time by necessary preparations, such as tamping the hole after the mixture has been made. The liquid air is not introduced until time for shotfiring. This reduces the evaporation period to a minimum.

The cardboard cylinder contains a perforated partition tube in which is placed a perfectly innocuous mixture of infusorial earth and oil or asphalt, or of soot and paraffin. The central partition tube incloses a cardboard tube, over which is thrust another cardboard tube to serve for carrying off the evaporation product of the liquid air. If several holes are to be fired at once, the electric wires are connected.

The liquid air intended for each hole is provided in a suitable quantity in a small flask to the opening of which is attached a metal tube with a conical point, into which tube is introduced the central tube of the cartridge. To charge the cartridge, it suffices to raise the back end of the flask. The liquid air is then lifted by pressure of its evaporation products (just as water containing gas is lifted by pressure of carbonic acid) in the metal tube and is forced into the cartridge. At the moment when the shot is fired by an electric fuse, the liquid air combines with the components of the charge and causes an explosion of extraordinary energy.

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*From an article by M. Przyborski, mining inspector, Budapest, Hungary, in the "Montanistische Rundschau."

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WITH 12 WATER-TUBE BOILERS AGGREGATING 1,500 HP. ALTERNATING CURRENT AT 2,300 VOLTS IS USED

Avoidable Engine Accidents

By C. W. Crawford*

SYNOPSIS—When a steam engine is wrecked, faulty design is often considered the cause. As a matter of fact, however, the machine may be the only properly designed piece of apparatus about the plant. Efficient separation of entrained water from the steam is good insurance against engine accidents.

In spite of all caution and remonstrance mishaps occur to the hoisting machinery of coal mines. These are called accidents. Sometimes such mishaps are disastrous, totally or partially disabling the engines. Breaking bed plates, smashing pistons by forcing them over or pulling them off the rods; straining keys and loosening winding drums, cranks or crankpins; breaking crossheads and shearing connecting rod bolts; breaking pillow-block caps, etc., are a few of the accidents which render an otherwise good engine a veritable scrap heap. The cause of these disabilities is generally disputed, and denied even if known, but it is to be hoped the truth will prevail sooner or later.

The odium of a smashup is usually put on the builder of the engine, whereas he is generally the only innocent party in the transaction.

The True Cause Is Obvious

On actual investigation the true cause is not hard to find. Water is carried from the boilers in spray, or sometimes in solid slugs of greater volume than the clearance space in the cylinders; and water being incompressible, the law of impenetrability provides no space for it, and the piston having the right of way, the water must get out or any one of the foregoing contingencies will happen. Of course some water does get away—sometimes—into the steam chest; but the engine being in rapid motion, all the water has not the time to escape. The piston stops dead on striking the water; but since the contact with it is made at the toggling point of the crank, the momentum of the heavy drum carries the piston forward. The pressure against it is practically incalculable—the strongest mechanical force in nature—and it is inevitable that something must break.

It is a distressful calamity to the mine owner when such an accident occurs in the midst of a cold snap and an extraordinary demand for coal, laying the mine out for a week or a month.

If such accidents were inevitable or due to some occult reason it would indeed be a calamity to all concerned; but since the cause is so transparently apparent and so clear to every one who thinks, it would appear a slur on the engineering profession.

This is no new calamity. Such accidents used to occur away back in steamboat times before the war; but the cure was found in using large steam drums.

The steam drum is now barred and debarred, ostracized, slandered and misrepresented until no one dares to recommend it. The boilermaker is the guilty party. He not only condemns the steam drum but has reduced the steam outlet from the boiler to a size inadequate to supply an engine of equivalent horsepower—and this appears to be a standard among boilermakers.

This is the first, prime, efficient cause of practically all the ills that hoisting engines are heir to. The violent ebullition in the boiler raises a spray which is caught up, together with some steam, by the pipe through which the latter passes at the rate of a mile a minute or more. This powerful draft necessarily draws the water in swells toward the outlet and obviously must catch more or less solid chunks of water at times when, as is often the case, the water gets pumped up too high while the fireman forgets. Anyway, it is certain the water is carried into the cylinders in solid slugs, because no other medium accessible to the engine could produce such unlimited resistance.

For comparison, consider the piston which is forced on the rod at a pressure of at least 60 tons, equal to 120,000 lb. The area of the piston (24 in. diameter) is 452 sq.in. With steam at 100 lb. per square inch this is equal to a total pressure of 45,200 lb. This gives a remainder of about 75,000 lb. in favor of the piston—and this without reference to the collar at the back and the riveting at the front. Whence comes this extraneous force that wrecks engines? Steam cannot do it, and nothing else except water ever enters the cylinder.

There is still another mischief which water does in the cylinder. Mud in considerable quantity is brought over from the boilers with the water, to the detriment of valves and rings. The balanced piston rings are gummed fast with mud and the balance is thus lost, making a load of several thousand pounds to be carried by the valve. Plain water is a poor lubricant and when mixed with mud it is not improved, while the oil lubrication is vitiated.

Entrained water is heated practically, if not quite, to the point of evaporation and exhausted in spray to humidify the atmosphere. It is not unusual in dry seasons to haul water by rail 15 mi. and disseminate it in light showers after heating it several hundred degrees. But coal is cheap at the mines.

A Separator Provides the Remedy

Only one thing is needed to obviate this waste and avoid the smashups—since the boilermaker cannot be diverted—and that is a separator, one that actually separates the water from the steam and that the engineer can make for himself out of pipe fittings, or (if such can be found) buy for $50 or less. Separators are numerous enough in the market—such as they are—but their principal function seems to be to separate $150 from the operator.

The separator I refer to is not new but is known to all mechanical engineers everywhere, and consists (when made of pipe fittings) of a tee about two sizes larger than the steam pipe, which must be vertical. The tee is placed so that the side opening leads horizontally to the throttle valve. The top end of the tee is reduced by a bushing so as to fit the vertical steam pipe, the end

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*Crawford & McCrimmon Co., Brazil, Ind.

of which is to have a thread sufficiently long to reach the center of the side outlet. The lower end of the tee has a short pipe attached, for a reservoir with a cap on the bottom and a trap connected to remove the condensed water. The reservoir must be large enough to accommodate any slug of water that may come over.

Such a separator will remove absolutely all the water and most of the spray that might otherwise do damage by passing through the cylinder. Its action depends on the velocity and specific gravity of the entrained water, its momentum carrying it past the side outlet into the reservoir, where it remains. The steam rises and enters the engine through the side outlet.

It is not expected that this device will give perfectly dry steam, but it at least guards against wrecking the engine. To get the best result, a dry pipe with a steam outlet at least twice the area of the boilermakers' standard should be installed in the boiler, as well as a large header line with drip pipes leading back into the boiler below the water line.

Probably not more than one engine in ten runs on really dry steam. Ordinary superheating (not extreme) renders steam dry enough, and by the time it reaches the cylinder it is toned down to about the proper saturated dryness for good lubrication and economy.

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Metropolitan Editors Visit the Anthracite Field

The operators and owners of anthracite mines acted as hosts to representatives of the metropolitan press on a trip of inspection throughout the anthracite field last week. The newspaper men and journalists were taken on a special train first to Scranton, where they arrived Thursday morning, Nov. 11. Practically all of Thursday, Friday and Saturday was spent in a hurried but detailed tour, from the most northern of the hard-coal mines to the southern collieries in and about Pottsville.

It is likely that never before were mine operators subjected to such a crossfire of questions, and it is certain that never in the history of anthracite mining have the big bosses been so frank in their responses. A real effort was made to show coal mining as it actually is, and although the operators endeavored to exhibit some of their most modern operations, there was not the slightest attempt to cover the uglier sides of the business or hide the older plants.

The newspaper men were taken through breakers, power houses and all other surface buildings, while two trips were made through underground workings. In a number of places the homes of the miners were visited. Old-time conditions were compared with the more modern developments, showing at least the desire on the part of the owners to improve the surroundings of their employees. The difficulties and dangers of mining were represented in their true light, while first-aid provisions were shown and described.

The editors supplemented their visual observations with numerous notes covering such matters as wages, costs of mining, prices of coal lands and initial outlay for plants. They seemed to be more interested in what was being done to educate the miners than in the methods of getting out coal. Day and night schools came in for much comment, and it is probable that mine owners received some impressions themselves as to what the outside public expect of those who control the destinies of thousands of workingmen. The operators and their guests included the following persons:

COAL MEN

S. D. Warriner, president, Lehigh Coal and Navigation Co.
E. E. Loomis, vice-president, Delaware, Lackawanna & Western R.R.
W. J. Richards, president, Philadelphia & Reading Coal and Iron Co.
F. M. Chase, vice-president and general manager, Lehigh Valley Coal Co.
A. C. Dodson, vice-president, Dodson Coal Co.
T. M. Dodson, vice-president, Charles M. Dodson & Co.
W. L. Connell, president, Green Ridge Coal Co.
C. F. Huber, president, Lehigh & Wilkes-Barre Coal Co.
S. B. Thorne, president, Temple Coal Co.
F. H. Hemelright, vice-president, Thorne, Neal & Co.
J. B. Neale, president, Duck Run Coal Co.
F. E. Zerbey, general manager, Kingston Coal Co.
W. A. May, president, Pennsylvania Coal Co.
W. W. Ingliss, general manager, Hillside Coal and Iron Co.
Edwin Ludlow, vice-president, L. C. & N. Co.
Eli T. Conner, Hudson Coal Co.
Frank Pardee, general manager, A. Pardee & Co.
Calvin Pardee, Jr., president, Pardee Bros. & Co.
Percy C. Madeira, president, Madeira, Hill & Co.
Alvin Markle, G. B. Markle & Co.
John Markle, president, G. B. Markle & Co.
A. B. Jessup, general manager, G. B. Markle & Co.
D. B. Wentz, president, J. S. Wentz & Co.
J. L. Kemmerer, Whitney & Kemmerer Coal Co.
Charles Dorrance, Hudson Coal Co.
E. R. Pettebone, general superintendent, Hudson Coal Co.
H. H. Brady, president, West End Coal Co.
C. D. Simpson, West End Coal Co.
J. B. Dickson, Dickson & Eddy Coal Co.
Morris Williams, president, Susquehanna Coal Co.
W. H. Williams, vice-president, Delaware & Hudson Co.

EDITORS

W. E. Brigham, Boston "Transcript."
John Ryan, "Manufacturers' Record."
Louis Garthe, Baltimore "American."
E. W. Parker, Anthracite Bureau.
J. Fred Essary, Baltimore "Sun."
R. W. Wilson, Cleveland "Leader."
J. Nevin, United Press.
Mr. Robinson, Syndicate.
Frank Strother, "World's Work."
John Foord, "Journal of Commerce."
Ralph Pulitzer, New York "World."
C. M. Gilbert, New York "Tribune."
C. W. Barron, "Wall Street Journal."
C. A. Hebb, Brooklyn "Eagle."
C. J. Post, New York "Globe."
F. E. Saward, "Coal Trade Journal."
F. M. Knowles, New York "Mail."
B. C. Forbes, New York "American."
Harold M. Anderson, New York "Sun."
Harold Johnson, "Wall Street Journal."
E. Wardman, New York "Press."
Lawrence Abbott, "Outlook."
Dr. J. A. Sleicher, "Leslie's Weekly."
Mr. Blake, "Collier's Weekly."
John Gavit, New York "Post."
E. W. Scudder, Newark "News."
H. W. Coates, "Black Diamond."
Floyd W. Parsons, "Coal Age."
S. H. Barker, Philadelphia "North American."
John P. Dwyer, Philadelphia "Record."
J. H. Lambert, Philadelphia "Telegraph."
W. A. Connor, Associated Press.
George W. Douglas, Philadelphia "Evening Ledger."
S. W. Meek, Philadelphia "Press."
H. L. Collins, Philadelphia "Public Ledger."
George Rogers, Philadelphia "Inquirer."
O. Phillips, New York "Times."

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Delay of Coal Shipments—In a suit against a railway company for delay in delivering a shipment of coal, the burden is on it to show that the delay was caused by a connecting line from which it received the shipment. If the delay entails loss to the owner substantially equaling the value of the shipment, he may refuse to receive the coal when tendered to him. (Alabama Court of Appeals, Goodwater Manufacturing Co. vs. Central of Georgia Ry. Co., 69 Southern Reporter, 343.)

Rocky Mountain Coal Mining Institute to Meet

The next regular meeting of the Rocky Mountain Coal Mining Institute will take place in the convention room of the Albany Hotel at Denver, Colo., commencing at 10 a.m., Nov. 29, and continuing two days.

The regular business, including the reports of committees and the election of officers for the ensuing year, will receive the attention of the institute, after which some very interesting papers will be presented and discussed.

The Albany Hotel has been selected as the official headquarters, and the management has offered the visiting members special rates in addition to the free use of the convention hall and committee rooms.

The following committees have been appointed: Arrangements—W. C. Ferguson, Equitable Building, Denver; H. C. Glaze, First National Bank Building, Denver; Samuel Tescher, Colorado Building, Denver. Entertainment—Benedict Shubart, Boston Building, Denver; W. H. Bullock, Gas and Electric Building, Denver; J. C. Roberts, Golden, Colo. F. W. Whiteside is secretary-treasurer and E. H. Weitzel the president.

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October a Big Month

The month of October has been a big one in the coal industry from the point of tonnage. As a matter of fact, when the tonnages are all computed it will be found to have been one of the biggest Octobers for many years. This is owing to many causes, the chief of which are the lack of household storage, buying during the summer, an extremely warm September and trouble looming on the horizon next April.

There is no doubt that this last factor will contribute largely to the tonnage for the next five months; so with weather anywhere near seasonable the coal business is sure to be really active for some time. No particular complaint is heard about collections these days, from either the shipper or the retailer, which is certainly an important consideration.

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Winter Meeting of Coal Mining Institute of America

The Coal Mining Institute will hold its winter meeting at the Fort Pitt Hotel, Pittsburgh, Penn., on Dec. 21, 22 and 23. The business session will be held at 10 a.m. of the first day. At 1:30 the question box will be opened and the following questions read: To what extent has a machine been developed for mining and loading coal? Leaders S. A. Taylor and W. A. Weldin. What part should the gasoline locomotive take in mine haulage? Is the purchase of power advisable for coal-mining operations? Leader J. F. Jenks, general manager West Penn Electric Co.

At 6:30 p.m. the institute dinner at $1.50 per plate will be held and Sion B. Smith will speak on "The Bearing of the New Compensation Act on the Coal-Mining Industry of Pennsylvania," and H. B. Mellor will explain the mining extension work of the University of Pittsburgh, with which he is associated.

On the second day, Dec. 22, W. H. Howarth, the mine inspector, will discuss "Methods of Concentrating Mining in the Lower Connellsville District" and S. B. Belden, "The Use of Storage Batteries in Mines." At 1:30 p.m. Joseph Williams will give the advantages of permissible explosives and Joseph Knapper will point out their disadvantages. Edwin M. Chance will read a paper on "Mine Gases," and G. A. Burrell will describe a new methane detector.

On the third day J. H. White, of the Bureau of Mines, will discuss "Welfare Work in Its Relation to Workmen's Compensation" and H. M. Wilson, director National Safety Council, will read a paper entitled "Workmen's Compensation and Mine Safety with Reference to Cost of Producing Coal." Adjournment will follow at noon.

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Anthracite Refunds

The refund of the Pennsylvania state tax on anthracite has been delayed pending a decision on the request for a rehearing made by the attorneys for the state. It is now possible that, by the time the issue on the law of 1913 is reheard and settled, action on the act of 1915 will contrive to keep the dealers in an expectant frame of mind.

In addition to this it is now rumored that the reduction of 40c. per ton on anthracite-coal freight rates to Philadelphia ordered by the Public Service Commission will soon be again brought forward by a final decision of the commission. It will be remembered this was to go into effect last January, but was appealed by the railroads. If by a fortuitous chain of circumstances the dealers should receive a refund on this account also, it would mean a great deal to them. It is also well to recall that the reduced freight rates ordered on anthracite to interstate points by the Interstate Commerce Commission are supposed to become effective Dec. 1, to which date the order was suspended on request of the railway companies for time in which to prepare their tariffs.

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Market for Coal in Portugal

Prices of coal in Portugal, already double what they were before the war, are gradually increasing, says *Commerce Reports,* and the supply of fuel on hand is small. The latest quotations for Welsh coal are $10.20 to $10.70 and $11.90 to $12.90 c.i.f. Lisbon. Lower qualities bring $9.25 to $9.50. The English freight rate is also advancing and is now $4.15 to $4.85 a ton.

Local dealers generally admit that America could supply this market if freights from the United States were around $4.85 to $6.10 per ton. Some cargoes of Pocahontas coal have arrived here recently and are giving satisfaction, but on account of the high freight it is difficult for this fuel to compete in price with the Cardiff coal generally used in Portugal.

COMING MEETINGS

The Winter Meeeting of the Kentucky Mining Institute will be held this year at Lexington, Ky., on Friday and Saturday, Dec. 3 and 4, 1915.

Illinois Mining Institute will hold its annual meeting on Nov. 20, 1915, at Springfield, Ill. Election of officers will be held and the day will end with a banquet.

West Virginia Coal Mining Institute will hold its winter meeting at Fairmont, W. Va., on Dec. 8 and 9, 1915. Secretary-treasurer, E. N. Zern, Morgantown, W. Va.

The Labor Situation

SYNOPSIS—Subdistrict President O'Neill makes further charges against Colver officials. Progress is made in Illinois in the coöperative store business. The eastern Ohio miners finally ask for lower freight rates, and evidence in the Hocking district shows that railroads make excessive profits.

It will be remembered that Charles O'Neill, subdistrict president of the United Mine Workers of America, alleged that he was violently assaulted at the Colver hotel by parties who desired to prevent him from organizing the miners at the Colver mines. (For further information see "Coal Age," Oct. 30, p. 713, and Nov. 6, p. 758). O'Neill now brings a further charge to the effect that when he was riding in an automobile with James Mooney and Armada Pellizarri, organizers of the union, he was followed by two automobiles. One drew ahead of his automobile and stopped, thus trapping O'Neill and his friends. O'Neill alleges that in the automobiles were E. F. Saxman, general manager of the Ebensburg Coal Co.; his son, P. M. Saxman, superintendent of the mines; J. Sweisle, proprietor of a hotel at Colver, and J. A. Wilkinson, Ira Meyers and Richard Crouse, mine guards at Colver. These men, he says, jumped from the automobiles and dragged the three men from their machine and beat them till they were cut and bleeding. They then jumped into their automobiles and drove off.

A Strike in Violation of Contract to Arbitrate

The union in the Kanawha district has at last induced the few miners of the Montgomery Coal Co. to return to work. Their agreement required them to arbitrate their difficulty and prohibited them from seeking to obtain a decision in their favor by abstaining from work. They were idle for seven weeks, returning to work on Nov. 11. District Vice-President J. J. Cunningham and National Organizer H. D. Friel induced them to end the strike.

The labor situation in West Virginia and Ohio is so bound up with the question of freight rates, as is recognized by the operators, miners and the public, that further reference to freight matters is permissible in this column. As has been stated the West Virginia operators have for a long time felt that the 15c. increase in freight rates west would never be put in operation.

It has been announced, though not officially, that the Chesapeake & Ohio Ry. will not file tariffs with the Interstate Commerce Commission providing for the increased rate. George F. Randolph, first vice-president of the Baltimore & Ohio Ry., is quoted as saying that his road has made no definite decision on the subject. The Norfolk & Western Ry. appears also to be undecided. A largely attended meeting of operators has been held in New York City at which matters were discussed at length with the railroads. Another meeting is set for Nov. 17 and will be held at White Sulphur Springs, W. Va.

If West Virginia Escapes Higher Freight Rates, Ohio Will Ask For Lower Rates

The eastern Ohio operators have now made complaints before the Ohio Public Utilities Commission protesting against the rates charged for hauling coal by all the four steam railroads operating in that section of the state. In doing this they supplement the action of the district officers of the United Mine Workers of America in Ohio. They request that the court will reduce the rates to a point where they will not be "unreasonable and unjustly discriminatory."

The Pittsburgh Vein Operators' Association, comprising all the principal operators in Belmont, Jefferson and Harrison Counties, filed complaints against the Wheeling & Lake Erie, Baltimore & Ohio, Pennsylvania and the New York Central, in which it is alleged that the coal rates are "excessive, unreasonable and unjustly discriminatory." The Cambria Mining Co., which operates extensive mines in Belmont County, complained separately against the rates charged by the Pennsylvania R.R. Co. and on the same ground.

Though the complaint brought by the miners' organization soon developed into a contest between the Sunday Creek Coal Co., operating in the Hocking district, and the Hocking Valley and Toledo & Ohio Central, which railroads handle most of the coal from that district, the entrance of the eastern Ohio operators with specific complaints against the four coal-carrying roads in the eastern Ohio district gives promise that an adjustment of coal rates throughout the state will be made by the Ohio Public Service Commission.

It is probable that inasmuch as the complaints of the eastern Ohio operators were made separately from that of the miners' organization and the Sunday Creek Coal Co., the eastern Ohio rates may be determined in a separate decision from those of the Hocking district.

They were induced to ally themselves in the contest against the railways because they had ceased to hope that they would be able to secure an increase of West Virginia interstate rates. It is expected to be shown that many of the railway coal rates have not been changed or revised in a generation, although methods of transportation have in that time undergone almost revolutionary changes.

Large Profits Made in Ohio Coal Transportation

The most important development when the hearing of the complaint was resumed was the evidence of Rate Expert C. W. Hillman, who went over the books of the Hocking Valley Ry., which is one of the defendants in the case. This company is earning a profit of about 200 per cent. on coal shipments from Nelsonville to Columbus and about 85 per cent. profit on shipments from the former point to Toledo, Fostoria and Marion, according to Hillman. He testified that the total cost of shipping coal from Nelsonville to Columbus is 21c. a ton, for which the shipper is charged 65c.

The cost of moving coal from Nelsonville to Toledo is about 47c., while the shipper is charged 85c. for the service. Hillman's figures also covered other points on the line. He was aided in the examination of the company's books by several other authorities, including Beman Thomas, who is the commission's regular rate expert. The hearing will probably last at least 10 days.

Attorney John F. Wilson, representing the Hocking Valley Ry., tried to undermine the testimony of C. W. Hillman. Not only did he question Hillman's impartiality and bring out the fact that he is in the pay of the Sunday Creek Coal Co., which is the force behind the miners, but he also attacked the testimony at various points by attempting to get admissions that the estimates and calculations from the Hocking Valley's books and records are inaccurate and incomplete.

The matter may have importance later if the case reaches the Supreme Court after disposition by the commission. It is to the court that appeal must be taken by either party dissatisfied with the finding made.

The principal object of attack by Mr. Wilson was Mr. Hillman's division of charges as between freight and passenger traffic. Mr. Hillman insisted that any other methods than those he used in arriving at results would make but little variation in the final figures. He declared that in one case the difference was only $5,000 in a general item of $4,500,000, or less than one-half of 1 per cent.

Illinois, Arkansas, Oklahoma and Colorado

In Illinois coöperative store management is making continued progress. The Union Fuel and Supply Co., which is really owned by local No. 755, of Staunton, Ill., has just purchased the building of Jacob Moehrman in the Luker-Moehrman-Schmidt Block. A new warehouse will soon be built near the Wabash R.R. track.

As noted in the last issue, John P. White recently took charge of District 21 and appointed executive officers in place of Peter Hanraty, of McAlester, Okla., and William McLachlin, of Huntingdon, Ark. Apparently the charges against Hanraty, like those against Howat, do not prevent his being extremely popular. Both Hanraty and McLachlin received the majority of the nominations cast for the offices that they formerly held and recently resigned. All the district officers now temporarily dispossessed in District 21 are looking for reëlection, the date of which has not yet been set. District No. 21 covers Arkansas, Oklahoma and Texas.

In "Coal Age" of Sept. 25 were recorded the conditions leading up to the arrest of Horace N. Hawkins and Fred W. Clark, counsel for the United Mine Workers, on charges of subornation of perjury. Judge Wiley, of Alamosa, quashed this case in the district court. The case was filed by Fred Farrar, the attorney-general of Colorado, and the charge was inducing Grover Hall, a juror in the trial of John R. Lawson, to make untrue representations to the effect that he had been coerced into agreeing with the verdict of guilty.

In South Wales, England, it is reported that 50,000 miners tendered on Nov. 15 two weeks' notice that they would stop work until all the men employed in the collieries joined the South Wales Miners' Federation. It is time that strict measures of control be applied to this exceptionally disloyal union.

Editorials

Beneficiary Insurance Funds

There are many operators who have started beneficiary insurance funds. *Coal Age* is anxious to obtain some account of their operations for publication so that its readers who are desirous of establishing such institutions may have an opportunity to model them on the basis of the more successful of such funds. Recently an inquiry was received asking for information, and the answer made was distressingly meager, the companies that had established such funds having been painfully modest.

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The Trend of Conditions on New Coal Contracts

This is ordinarily not a season during which many fuel contracts are placed. Orders such as that at Auburn, Me., for county buildings (p. 738) awarding 500 tons for less than $4.75 for Georges Creek, however, show a normal condition for this time of year. While the Bay State Street Ry. purchase of 15,000 tons of New River (p. 738) and that of the City of Boston for 12,500 tons (p. 787) were both cases of emergency buying, partly to secure extra supplies and partly to replace coal that had been deemed unsatisfactory, the prices showed the strength of the market for spot delivery and for shipments between now and Apr. 1.

The Crocker-Burbank Co., Fitchburg, Mass., order (p. 738) for 50,000 tons of Georges Creek for 12 months from Oct. 1, also an out-of-season contract, is understood to have been placed at full circular prices, but contracts made for the year beginning Apr. 1 are on an entirely different basis.

The announcement early in October (p. 662) that one of the large distributors would name a low price for handling coal for delivery inland from Mystic Wharf, Boston, Apr. 1, 1916, to Apr. 1, 1917, has led to marked developments. From a handling charge that meant $3.60 on cars Boston if the Hampton Roads base figure continue $2.85, quotations have through competition slid down 25c. to $3.35, and probably the bottom is not yet reached. Thus we have a novel situation—prices for shipments prior to Apr. 1 quite firm, and deliveries for a year thereafter as low as any season quotation in years and with a "protection" against a further decline. A large tonnage has already been covered in for the next contract year, but for the most part it has been closed along the usual channels; that is, by shippers holding the business the current year. There are cases, however, of large tonnages being bid away by aggressive merchants, and there are cases of reprisal in plenty. All told it is unwholesome price warfare and doesn't augur very well for operating returns. The contracts closed are of the kind that are placed within limited circles and are accessible only to dealers in close personal touch.

For a time it was expected this "soft spot" would be strictly confined to inland trade "on cars Boston" and to points where other distributing ports like Portsmouth, Providence, etc., compete with Boston, but the same indications are now appearing in quotations made alongside dealers' wharves—first those accessible by lighter from Boston and latterly places accessible to steamers and barges.

The only contract activity in the Philadelphia market has been in the municipal business. The deficiency contract (No. 1573, pp. 699, 828) recently awarded by the Water Bureau was taken at very much higher prices, there being an almost complete change of contractors. The trade shows very little willingness to enter into new contracts on account of the expiration of the agreement with the miners at the end of March. This is shown by a number of small contracts going begging, such as schools and institutions. Many of these have delayed buying until now, and find few and in some instances no tenders at all for their business, compelling them to purchase at the market rates.

Usually at this time of the year the anthracite operators begin to tie up their steam users to contracts for the new year, but up to this time no effort whatever has been made in this direction, although some of the companies have announced their willingness to carry customers on the old contracts until the end of March. These are isolated instances, however, and it is expected that the companies will soon solicit their regular contracts, the delay seeming to be due more to uncertainty as to what the prices will be.

In Ohio one of the larger office buildings has laid in its supply at $1.75 per ton for Hocking nut, pea and slack delivered, while the same quality of coal was bought last year for $1.65.

The price at which the City Council of East St. Louis awarded a contract to the William Helfrish Coal Co. (p. 662) for furnishing about 1,000 tons of 2-in. shaker-screened coal to the city departments was $1.60 delivered, which was regarded as a favorable figure.

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Paying Mine Workers Both for Time and for Output

The public is quite generally of the opinion that the wage based on performance—the piece or ton wage—is the one which makes most certainly for efficiency, but it may well be doubted whether that popular idea is true. A certain definite wage for a certain amount of output is eventually set, and increased advantages to the operative which will enable him to do more work are not allowed to alter the output wage.

As a result there is no tendency on the part of the employer to aid his employee by improving conditions after any of the known methods, such as training the workman, routing his work, providing him promptly with the material for his labor, speeding his machinery or providing him with efficient tools.

Thus while output wages make the workman more efficient, they make the operator less disposed to provide for economy. As a result the outcome is probably less favorable than if the workman had no interest in effective labor, and his employer by harrying him could gather in all the profit resulting from proper methods of operating. In coal mining the operator has his coal mined at a certain price per ton, say 50c. So long as there is such a scale fixed, the operator feels no direct need to enable every man to produce a big tonnage.

In hauling the coal, in dumping and cleaning it, in providing power to mine it, the operator can make economies, but in the mining of it 50c. per ton is for him the unvarying rate, so that on about two-thirds of the cost he can make neither savings nor losses.

He may fill up his mines with unnecessary men; he can start the plant in the morning without railroad cars available and shut down the tipple after a few hours of perfunctory work; he can let the men go in to load and find their places not cut; he can permit the undercutters to find their rooms occupied by loaders; he can allow the workmen to be hampered for lack of power or of pumps or to be hindered by drivers or trackmen, or he can tie them up by bad ventilation or antiquated or expensive methods of working, and still the rate is 50c. per ton—the scale rate of the district—for there is no premium on the operator's coöperation with his men.

The workman may well be efficient out of pure honesty of disposition or solely because he likes to work hard. There are such men, but they are of course only too few. But with operators mere honest intent, mere alertness to seek the good of the workman is not enough. The mine owner and his superintendent may be both honest and alert and yet do the workmen and the state much harm.

For to get a perfect coördination between railroad employees, trimmers, rock and coal dumpers, drivers, cutters, loaders, tracklayers, pumpers and engineers involves the hiring of many bosses and the laying out of the workings at much expense to produce these results. Also sometimes the daymen whom the operator must pay must lie idle to afford the miners a chance to work. The purchase of much equipment and machinery is also necessary to enable the miner to put out a good day's output.

For the advantage of the day hands all aids to coördination and to effective output are well justified, for the operator can save by carefully watching his opportunities, but that rate of 50c. per ton to the miner and loader cannot be reduced. It is a stumbling block to economy.

For a long time it retarded the introduction of steel rails into rooms and prevented the use of reliable partings at the room necks. At one time the operator provided the props any length he chose; the men could always cut them to length on their own time. In many cases the men were asked to wander around the mines to find spikes and ties and rails in unspecified chambers and required to drag them to their own rooms for relaying. And this because the operator had no interest in efficient mining, whatever he might have in efficient transportation or dumping.

That 50c. per ton is fixed; there is no chance for him to clip it. There are many ways in which by better machinery, more superintendence, better management, more suitable equipment, training of the men and new methods of working that 50c. could be cut with benefit to both operator and miner, but one cannot blame the latter for opposing such a cut, for he cannot be sure that the advantages promised will be all they are alleged to be or will always be forthcoming.

The operator honest and alert to help the miner cannot be asked to give up his only hope of not losing money to help out the miner in this dilemma. His profits are dependent on his success in cutting down the wages of superintendence, in speeding the drivers and other day hands and on eliminating the dead work and like costs, while helping the miner tends largely to involve the operator in failure.

The interests of the miner and his employer should be one, but with our output wages the employee appears to get all the benefit. As a matter of fact he retains too much of the profit for his own good, and the employee as in all cases where an unequal bargain is driven is really the loser. Neither party can really afford to make such a contract. Nor are such agreements profitable to the state.

In fact a combination of a minimum wage plus a lower rate of remuneration per ton of output is the logical way to pay for every operation around the mine. There would be no reason then to pay for abnormal places, for cutting necks or crosscuts, for clay veins or other difficulties. The minimum rate would secure pay for the miner for all these disadvantages.

By enabling the workman to do a large day's work the operator would secure a larger output for less money. No longer would mines be filled with men above their hauling and loading capacity or beyond the ability to wash coal or use it at the ovens. The day-wage part of the contract would hinder such needless hiring of men. Nor would there be much loafing at the work, for the output wage would tend to prevent it.

But still it would be necessary perhaps to provide for hurrying up the do-less ones by providing some method of watching the work. That could be done by providing a method of longwall retreating by panels with a conveyor system, thereby concentrating the work.

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An Invitation to Co-operate

We are particularly desirous that all our new readers who have come to us through the consolidation of *The Colliery Engineer* with *Coal Age* shall understand our definite policy in the matter of contributions to our editorial pages. From the beginning of its existence this paper has sought to encourage the submission of articles, letters and discussions from subscribers, with the idea of increasing the value and interest of the reading pages. We have stated frequently, and repeat now that *Coal Age* is an open forum for the expression of opinions by all responsible coal-mining people. Such views need not correspond in the least with the opinions held by the editors; in other words, the paper is the mirror of the entire industry and not a reflection of two or three individuals.

If you have never sat down and put some of your experiences or ideas into writing suitable for publication, start now by sending us a contribution for our Electrical Number, Dec. 4. Pick out the most interesting subject you know of pertaining to the use of electricity in mines and get the facts out of your system and into print. All such articles that are published are paid for; but that is the smallest part of the value received by you, for it is a fact that no work you can do will be more profitable in the way of increasing your education, multiplying your friends and extending your reputation than literary efforts in your chosen vocation.

Sociological Department

A Wyoming First-Aid Meet

By Thomas Gibson*

SYNOPSIS—Southern Wyoming gathered at Rock Springs for a first-aid contest, one team coming 159 mi. from the east and two others from a point 103 mi. in a westerly direction.

The southern Wyoming operators held the first of a series of first-aid meets at the Ball Park, Rock Springs, Wyo., on Labor Day, Sept. 6, 1915. At this meet representatives were present from the Union Pacific Coal Co., the Gunn & Quealy Coal Co., the Kemmerer Coal Co. and the Superior Coal Co. In charge of the event was J. J. V. Forbes, a first-aid instructor of the Bureau of Mines, who also announced the events.

The meet opened at 9 a.m., all the first-aid teams present assembling at the first-aid hall of the Union Pacific Coal Co. to take part in the Labor Day parade. There were eight first-aid teams in the line of march, and they were headed by the boys' band. Thousands of people lined the sidewalks to see the marching hosts, and the first-aid men availed themselves of the opportunity to perform some first-aid work for the benefit of the spectators. Their skill was awarded with much applause.

On their arrival at the ballground, Thomas James, chairman of the city council, on behalf of Mayor Anderson welcomed the many men, women and children assembled to view the contest.

The executive committee consisted of D. G. Thomas, mine superintendent of the Rock Springs mines; Thomas Gibson, chairman of the bureau of safety, Union Pacific Coal Co.; John Maxwell, mine foreman; John Sorbie, secretary of the first-aid organization; Joe Trayer, assistant superintendent; Matt Marshall, miner; Ralph Buxton, mine foreman; Charles Gregory, assistant mine foreman; Thomas Foster, mine foreman; George Smith, miner, and J. J. V. Forbes, first-aid instructor. The space marked off on the ground in which the work was to be performed measured 40x148 ft. A supply base measuring 8x8 ft. was alloted to each team for the purpose of keeping first-aid supplies. A space of 12 ft. was maintained between the team bases so as to systematize the work. All the first-aid events were performed in a space measuring 8x40 ft. immediately in front of the supply base. This arrangement afforded the thousands of spectators in the grandstand a clear view of all the first-aid events.

DOCTORS AND COMPANY MINE OFFICIALS DO THE JUDGING

The following doctors and mine officials judged the first-aid events: Drs. J. H. Young, G. E. McDonald, J. H. Goodnough and C. F. Moon; mine officials, F. S. Davis, William M. Hartman, F. L. McCarty and Joe Traher. The progressive system of judging was adopted.

TEAM FROM ROCK SPRINGS NO. 8, WITH VISITORS

From left to right—T. Gibson, chairman, Bureau of Safety; T. A. James, Rock Springs City Council; R. D. Oliver, miner; J. Overy, miner; T. Radalj, miner; H. Miles, cager; M. Marshall, machine runner; T. Scott, motor runner, and E. Dunn, miner, captain

With the assistance of J. J. V. Forbes, I selected the following program of events. What these were was not revealed to anyone until the teams were on the field and ready to demonstrate their skill.

One-Man Events—A miner who has been overcome by powder smoke in his working place is found to have sustained a simple fracture of the right forearm. Remove 20 ft. to entry and treat. Time allowed, 8 min.

A miner has a severe cut on the right temple which is bleeding. The right side of his jaw is cut, and he has a simple fracture of the right collarbone. Time allowed, 8 min.

Two-Man Events—A driver is caught between two mine cars. His right eye is badly bruised, his right shoulder-blade broken and his right ear is torn. Remove 20 ft. and treat. Time allowed, 8 min.

TEAMS OBTAINING FIRST AND THIRD PLACES AT MEET, WITH MINE OFFICIALS

From left to right—Dr. G. E. McDonald, of Superior; G. A. Brown, mine foreman, captain; F. Swanson, electric machine boss; F. L. Davis, superintendent; E. Tinkler, miner; S. Traher, assistant mine foreman; F. Pellican, electrician, and C. Albertini, miner, all from Superior, and three others from Rock Springs who couldn't help associating with the winners; D. G. Thomas, superintendent at Rock Springs; J. Traher, general inside foreman at Rock Springs, and J. Doak, inside engineer No. 7 mine at the same place. Farther on, from left to right—J. J. V. Forbes, first-aid instructor, Bureau of Mines; G. B. Pryde, general superintendent; T. Hartney, material clerk; R. Knox, driver; J. Wise, miner; J. Goddard, electrician; C. Gibbs, tracklayer; W. Reid, machine runner, captain; F. L. McCarty, superintendent; Dr. C. F. Moon, visiting physician from Omaha; Dr. J. H. Goodnough, of Reliance, and C. Durham, general outside foreman

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*Chairman, Bureau of Safety, Union Pacific Coal Co. and Superior Coal Co. mines.

A miner is found unconscious, lying face down on a live electric wire, with abdomen badly burned. Rescue and give treatment.

Team Events—A miner is found with a broken back. Treat and carry him 25 ft. on a stretcher and place him in an upright position. Time allowed, 14 min.

On a shot blowing out, a shotfirer has his right eye badly injured, his right arm broken below the elbow and his left ankle sprained by a fall. Transport 50 ft. with an improvised stretcher. Time allowed, 12 min.

A mine worker has suffered a compound fracture of the middle of the left thigh, with profuse arterial hemorrhage, and a cut from the outer corner of the right eye to the top of the right ear, with bleeding. Time allowed, 15 min.

A powder keg has exploded, burning a miner severely on face, neck, chest and both hands. Carry 25 ft. with improvised stretcher and attend. Time allowed, 12 min.

FIRST PRIZE GOES TO SUPERIOR MINE TEAM

The first prize, a free trip to the Panama-Pacific Exposition, where the contestants were to compete for interstate supremacy, was awarded to the Superior Coal Co. team, Superior, Wyo. This prize was purchased from funds provided by the Union Pacific Coal Co., Gunn & Quealy Coal Co. and the Kemmerer Coal Co. The team scored 780 points, or 97½ per cent. of a perfect score. The names of the winners are G. A. Brown, captain, Steve Traher, Ed Tinkler, Frank Pellican, Charles Albertini and Frank Swanson.

The team from No. 7 mine, Rock Springs, Wyo., Union Pacific Coal Co., took second place with 773 points, or a rating of 96⅝ per cent. The names follow: Charles Gregory, captain, William Black, Mike Palko, B. Dallabetta, Archibald Auld and John Sorbie. The prize which this team received consisted of $10 which had been contributed by the Labor Day committee.

WINNERS OF SECOND PLACE, ROCK SPRINGS NO. 7

From left to right—J. Maxwell, mine foreman; C. Gregory, assistant mine foreman and captain; B. Dallabetta, timberman; W. Black, motor runner; A. Auld; M. Palko, miner; J. Sorbie, motor runner, and T. Thomas, driver

The third place went to the Reliance, Wyo., team with 764 counts and a percentage of 95½. The team comprises the following members: William Reid, captain, Charles Gibbs, Joseph Wise, John Goddard, Robert Knox and Thomas Hartney. The "Journal of the United Mine Workers of America" of Indianapolis, Ind., presented six one-year subscriptions to this team in recognition of its securing third place.

The team of mine No. 10, Rock Springs, made 759 counts, equivalent to a percentage of 94⅞. Thomas Foster is captain and the team consists of George Smith, Frank Vahar, Andrew Bone, Stanley Preece and Robert Smith. Mine No. 8 at Rock Springs was fifth in order, with 757 counts and a percentage of 94⅝. The captain is Ed Dunn and his corps consists of Thomas Scott, Matt Marshall, Harry Miles, Tony Radalj and Joseph Overy.

The Hanna team of the Union Pacific Coal Co.—Thomas Town, captain, Thomas Hughes, Alfred Cheebrough, James Meekin, R. S. Barrie and Thomas Meekin—took sixth place and received 758 counts, or a percentage of 94¾. Cumberland No. 1 mine of the Union Pacific Coal Co. was represented by a team comprising F. O'Connell, captain, William Goddard, J. L. Faddies, Peter Boam, William McLean and William Gibbs. This team took seventh place, with 730 counts and a percentage rating of 91¼. The last place was secured by Cumberland No. 2 mine of the Union Pacific Coal Co. This team made 716 counts and a percentage of 89½ per cent. J. D. Jones is captain and the other men in the team are John Smith, Dan Jenkins, John Buchanan, Lyman Fearn and Nels Nelson.

At 9 p.m., the first-aid teams and the officials connected with the meet assembled at the First-Aid Hall, Rock Springs, for a smoker. After cigars were passed around, the chairman of the first-aid society, John Maxwell, called upon a number of officials and guests, who responded with short talks bearing on the future plans for increasing the scope of first-aid work throughout the state and complimenting those in charge of the meet for the systematic manner in which the meet was conducted. The affair was pronounced a great success by everyone present.

Sociological Notes

The Cost of Living Declined 5 per cent. between Oct. 30, 1914, and the same date in 1915, and 6 per cent. between Jan. 3, 1915, and Oct. 30, 1915, according to the New York "Times."

A Delayed Shot Killed Two Miners at Silver Creek Colliery Oct. 22, blowing them into such small fragments that the first-aid corps gathered up the remains in sacks.

A Special Rate for Drinking Water in Tanks of $1 per tank has been established by the Colorado & Southern Ry. for the arid coal camps of the southern district. This rate has been approved by the state Public Utilities Commission. The rate is regarded as quite low, though the haul is in every case not long.

The Rockefeller Foundation Will Spend $100,000 for the erection of model Young Men's Christian Association buildings throughout the State of Colorado. They will be erected in all but the smallest camps, but they will not be used to replace the present clubhouses, which are to be made more comfortable and uptodate in every particular. They are to include gymnasiums, swimming pools and libraries and will be splendidly equipped throughout.

The Superior Coal Co. is holding mine foremen's meetings at Superior, Wyo., and at these much interest is manifested in the discussion of vital problems in mining and management. The following meetings have been held: Nov. 3, "Haulages, Methods and Costs," Mr. Brown, chairman; Nov. 11, "Timber and Timbering," Mr. Dykes, chairman; Nov. 17, "Machines and Machine Mining," Mr. Whalen, chairman. Two further meetings have been arranged: Nov. 24, "Blasting and Drilling," Mr. Hicks, chairman, and Dec. 1, "Material and Requisitions," Mr. Paulson, chairman.

At Assumption, Ill., a Miners' Night School has been started by the Assumption Coal and Mining Co. It is intended principally for mine employees, but it is open to everyone who wishes to avail himself of the opportunity. To date, 52 men and boys have enrolled. The teaching staff consists of Professor Stanberry, T. A. Devlin, a high-school graduate and later of the engineering department of the University of Illinois, and Albert Palmer, graduate of the normal school and a former school teacher. The class has elected the following officers: T. J. Connolly, mine superintendent, president; F. E. Taylor, electrician, secretary; and A. Palmer, machinist, treasurer.

The Colorado Fuel and Iron Co.'s Industrial Bulletin, a quarterly periodical measuring 8x10⅝ in., was issued first in October of the present year in accord with the agreement between the company and the mine workers in that month. It has an illustrated cover and 31 pages of type matter and illustration. It contains a list of the officers, mine superintendents and employees' representatives, a letter from the president, J. F. Welborn, some notes of interest about the John D. Rockefeller, Jr., trip, full-page illustrations of Rockefeller and of the conferees at Pueblo on Oct. 2, an open letter from Rockefeller in four languages, the Rockefeller address, the plan of representation, the memorandum of agreement, a diagram representing the method by which grievances can be adjusted, a summary of the voting and an account of the public-school conference.

The State Mine at Wonthaggi in Victoria, Australia, is the largest coal producer in that island continent. After allowing $224,541 for "depreciation, sinking fund, etc.," a net profit of $5,895 was obtained in the fiscal year ending June 30, 1914. The output was 2,576 short tons per day, and about 1,000 men were employed, only 450 of whom were mining coal on contract rates. The total output of coal for the fiscal year already mentioned was 616,120 short tons, valued at $1,203,083. The price was therefore $1.95 per ton. The miners averaged $3.40 per shift. The output obtained constituted 89 per cent. of all the coal mined in the province of Victoria. The price obtained for the coal is generous, the wage not inordinately large and the profit beggarly. It all goes to show that mining is being conducted with better results to all concerned under the capitalism of America than under socialism in Australia. It may be noted, moreover, that the "depreciation, sinking fund, etc." is large, being 18.66 per cent. of the value of the output, or 36c. for each ton mined. The profit was larger in the year preceding that under discussion, when it was $201,110.

Discussion by Readers

Store Checks vs. Thrift

Letter No. 3—There is no doubt that thrift among the mining classes is one of the most important questions that coal operators will have to face in the near future as being the only means of putting the mining industry on a firmer basis. The lack of thrift among miners has caused them to demand mining rates that have been prohibitive in many districts and coal fields, and those districts have suffered as a result.

Observation shows that the average miner is living from day to day with little or no thought of the future. Many do not care to work every day when they have a chance, but aim to make just enough to cover their store accounts. It is unnecessary to remark that a miner of this class has lost his ambition. He cares little how long he remains in one place, since he has not established a home that will make him contented to spend his evenings with his family. In fact a comparatively small proportion of mine workers have many things that make life worth living. These are the men whom one finds lounging in the company store after working hours. They can tell you how they would run the mine if they were boss, but they never realize that they are themselves the biggest obstacle with which the boss has to contend.

CONDITIONS SURROUNDING THE MINER

When the mines are working full time, the average miner should be able to make from $60 to $65 a month clear. While it is true that no man would get rich on this income, it is likewise true that if used in the right way the money will keep a medium-sized family in fairly good circumstances. For example, compare the average miner with his brother workman in the factory or the shop. By attending to his work and saving his wages, this man manages to buy a little home, though his earnings are often not as large as those of the average miner. This comparison shows that there must be something radically wrong in the attitude of the miner toward his work. He can make good money if he will, and he has every opportunity to save his earnings, as his expenses in a mining town are not great; but how rarely he does this.

The problem presented to coal operators by reason of this condition in mining towns is the providing of suitable means whereby their employees will be able to get the most for their money and at the same time to encourage them to save a part of their wages and to put this aside as a bank account. If the men can be induced to do this, it will generally prove a greater incentive to work and to improve their circumstances than anything else.

I have observed many improvements in the management of the company store, but it is a fact that the higher mine officials often value a man according to the amount he spends over the counter. He may be the most worthless fellow in the mine, but the foreman is unable to get rid of him on any pretext whatever. The man may not do 50c. worth of work in a shift if employed as a dayman, but the fact that he is getting $2 a day and leaving every cent of it in the store is sufficient to keep him on the payroll. A little reflection should show the management that this is a "leak in the payroll" that should be stopped. Where this condition exists it is easy to see that the commissary receives the first consideration. I am glad to say, however, that this is not the case in every mining town.

THE PURCHASING VALUE OF SCRIP

Few miners consider the value of scrip equal to that of the money it represents. In most camps scrip can be purchased at from 75c. to 90c. on the dollar, and it is handled with about as much care as so much old paper. A child is sent to the store with $5 or $10 of scrip, when it would not be trusted with the same amount in good old greenbacks. Purchases with scrip are often made with the same careless disregard of the value represented.

This failure to regard the money value of scrip is increased in many cases by the urgency of the store manager, who often induces a customer to buy goods that he really does not need. It is still a common practice for some companies to hire a store manager at a small salary and give him in addition a percentage on the sales he makes. Such an arrangement is productive of more harm than good, as it tends to impoverish the customer and in the end works against the best interests of the company. The light esteem in which the company scrip is held by the average miner makes his purchases in the store seem to him like getting something for nothing.

CAN A COMMISSARY BE RUN WITHOUT SCRIP?

I realize that commissaries are a necessity in many mining camps, but there is no reason why the scrip system cannot be abolished. This might cause some inconvenience for awhile, but the results would more than repay the operators for their trouble in making the change. I want to suggest that a commissary could be run to advantage on a profit-sharing system and stocked with the best grade of goods that can be sold to the mining trade at a fair profit. Then, at the close of every six or twelve months, after deducting a certain amount for running expenses and interest on the money invested, the remaining profit could be divided among the employees in proportion to the amount of their several purchases. It might be well to make the rule that only those employees who have been with the company for a certain length of time would be included in the profit-sharing scheme. I believe that such a system would tend to rapidly reduce shiftlessness among miners. A similar system has worked wonders for certain street-car companies, and it could certainly be adapted to the commissary trade.

NEED OF A BANK OR DEPOSITORY

While discussing the store system, let me suggest that it would be a good plan to have a bank or depository established in all mining camps, where miners could make deposits every payday, putting aside a portion of their earnings. I have in mind a certain mining district where several such banks have been established and are operated as purely commercial banks, but no systematic effort is made to induce the miners to patronize them. On the other hand, in some cases such a bank even goes so far as to furnish the company with pay envelopes bearing the address of the bank and commenting briefly on the advantage of a bank account to every man. This has the effect of reminding one when he draws his pay that it is good policy to start and keep up a bank account, no matter how small the deposits he may make.

Logan, W. Va. C. J. FUETTER.

Letter No. 4—If the average miner's wife were permitted to talk to the mine official referred to in the Foreword entitled "Store Checks vs. Thrift," *Coal Age,* Oct. 16, p. 619, she would unburden her mind to him about as follows:

"The fact that you did stop and think means that you are really interested in your employees, but if you were more fully acquainted with the conditions under which the miner's wife labors in her efforts to supply the daily needs of her family, you would know that the removal of the check system as a means of promoting thrift among your employees is based on a fallacious foundation."

With all due respect to men, the average experience of miners' wives is that their husbands habitually spend more than they can afford because they have been so long accustomed to support only themselves. I want to say that the check system is a blessing to the large majority of miners' wives because it gives them an available credit in the store that permits them to purchase the needed supplies for the family. When living at mines where the check system was not employed, the children and myself have often gone without suitable food and clothing, owing to my husband spending the money for things that were not needed in the home.

REASONS FOR HIGH COMMISSARY PRICES

It is true that commissary prices are often outrageously high. In some cases it has taken all that my husband could earn to buy the absolute necessities of life. I have sometimes wondered whether the peonage system in Mexico can be much worse than the conditions prevailing at many of the coal mines in this respect. The reason for these high prices is to be found in the fact that the storekeeper is instructed by the management to make a certain percentage on his goods, which is the only requirement. Many storekeepers come to understand that whatever they can make on the goods beyond this requirement stands to their credit.

Naturally, the storekeeper is not a very energetic man. He generally considers that if he sells a pair of shoes at 100-per cent. profit, the gain will be greater than to sell three pairs of shoes at 30-per cent. profit, and the transaction will cost him less effort. He applies the same principle to all the goods in the store. The charge for staple goods is generally 5c. more per can than elsewhere, and the price for meat practically forbids its purchase by most of the miners.

The natural result of these conditions is that a large proportion of the miners cash their checks at 20-per cent. discount and go into town, where they can buy the same goods for less money. There is often a great difference in the prices asked for goods in different camps. I have known a $5 purchase at one camp to be equivalent to an $8 purchase at another adjoining camp, with the result that the latter place drew the trade from the former.

Listen to what another woman might say, were she given the opportunity to unburden her mind in reply to the reflections of the president of the coal company as described in *Coal Age.* It would be about as follows:

"Our president has never come to look into the welfare of his camp as you have done. He knows nothing of the existing conditions and does not realize that he is getting his coal mined almost gratis. His mind is absorbed with the one idea of making money. His instructions to the storekeeper are, 'Put your prices as high as you can'; and they are certainly exorbitant."

After listening to this testimony, does it occur to any coal-mining president that the removal of the check system at the commissaries will lessen the burdens of his employees or remedy the existing evils?

THE OTHER SIDE OF THE QUESTION

The study of this question suggests that more would be accomplished if, instead of removing the check system as applied to commissaries, the management would instruct the storekeeper as follows: "You are required to make a certain fixed profit on the sale of goods, and no more. We would prefer that you sell three pairs of shoes at 30-per cent. profit rather than one pair at 100-per cent. profit. By so doing, you will hold the trade of the entire camp and satisfy our employees. Failure to follow these instructions will forfeit your position with the company." In addition to these instructions, the management might occasionally send a man around to see that his orders were carried out.

Following up the same line, the instructions to the superintendent should be to encourage gardening by every means in his power and to see that fertilizer and proper fencing are supplied at a nominal price (or better, at cost) to all living in the camp. Proclaim a gardening day when the mines will be shut down to give the men an opportunity to perform the necessary work in starting their gardens; also see that housewives are provided with such conveniences for their work as will tend to conserve their energies, that they may have some time and strength left for tending gardens. It may be suggested that the raising of garden vegetables will reduce the sales at the commissaries. There is little fear of this, however, as the money thus saved will be spent for other things at the stores, and a higher type of living will result.

By following these suggestions, let me say that the mine management will be teaching us thrift both by precept and example, and we will not be slow in catching the spirit manifested.

EXAMPLES OF GOOD COMMISSARY MANAGEMENT

B. F. Roden, owner and operator of the Roden Coal Co., Marvel, Ala., stated, in the beginning, that he was in the coal business and not in a mercantile business; that his commissary was to be run for the convenience of his employees. His storekeeper went to surrounding camps and towns to obtain price quotations, and his prices were brought to the same level or slightly lower. The result is that there is established at this mine an uptodate department store, which does a large business both inside and outside the camp. This is an example of what can be done in this direction by a small company. In addition to this, gardening is encouraged throughout the camp.

The Tennessee Coal, Iron and Railroad Co. is another example of good commissary management. The storekeepers of this company are instructed to make no more than a certain percentage of profit, which is low. The prices of all staple goods are fixed and subject only to market changes. Each storekeeper is required to send in a monthly report on his prices, and if he has overlooked any of the general market quotations to which his prices do not conform, he is promptly advised of the same. It is the custom in these stores to make small change and to cut the price below the usual nickel or dime when this is possible. If a customer presents a 10c. check in payment for an 8c. purchase, he is given 2c. in change. I want to ask, Is not this teaching thrift by example rather than by precept?

Results of Good Commissary Management

Experience has proved that commissaries conducted on the plan just described are proverbially successful. They build up a large trade and are patronized by the country for miles around. When fully carried out, the plan makes it optional to the miner or company employee whether he trades at the store or not. Also, he can either use the check system or, if he prefers, draw his money on payday and purchase his goods for cash. But a dollar in cash or in checks always buys a dollar's worth of goods. Thus, many of the burdens are lifted from the miner's wife. Companies that have adopted these plans give much attention also to the encouragement of gardening. Prizes are offered for the best gardens and lawns, and the companies often furnish the fertilizer, besides doing the plowing of the gardens.

In closing I want to emphasize the point previously stated—that the adoption of these methods is a greater schooling in thrift than can result from the abolishing of the store-check system. I want to suggest that, for the protection of the miners in many camps, it might be well for the mining department in the state to make and enforce rules regulating commissary prices on the necessities of life. A Miner's Wife.

Wylam, Ala.

A Flooded-Mine Proposition

Letter No. 2—Referring to the inquiry in regard to a flooded mine, *Coal Age*, Oct. 16, page 646, what strikes me most forcibly is the risk that was taken in driving rooms 40 ft. wide in the direction of old and abandoned workings. To the onlooker this seems to be the height of foolishness. It may be true, of course, that the management of the mine and the engineers were not to blame, owing to an incorrect survey and map of the old workings. Had this map been correct and available, it would have shown how far it was possible to drive the rooms in this mine and still leave a safe solid pillar of coal between it and the old workings. The map of the abandoned mine would also give an idea of the body of water accumulated therein. If complete, it would also show if the dip mentioned as existing at the face where the water broke through was a general dip.

Assuming that the seam is fairly flat, as stated in the reply to this inquiry, it is probable that the reduction in the quantity of water flowing into the new workings is largely owing to a decreasing head of water in the old mine and not to be wholly attributed to the heaving of the bottom. This would also be the case if the abandoned workings lay mostly to the dip of where the machine mined through the pillar.

Considerations in Building a Dam

The plan of this section of the mine given on page 646 does not show the distance that No. 4 room is driven ahead of No. 5. The pillar between these two rooms being only 4 ft. thick is not sufficient to give a firm foundation for a dam across the face of No. 4 room. In building this dam, therefore, as it will be necessary to cut in on both ribs in order to secure a good foundation, this can only be done safely when No. 4 room is from 12 to 15 ft. ahead of No. 5 room.

Assuming, as suggested, that the head of water is 100 ft., the pressure would be $62.5 \times 100 = 6{,}250$ lb. on every square foot of the dam. The room being 40 ft. wide and $4\frac{1}{2}$ ft. high, the total pressure on the dam is $6{,}250 \div 2{,}000 \times 40 \times 4\frac{1}{2} = 562.5$ tons, which would require a strong foundation. It will also be necessary to cut the roof and floor in the same manner as each rib and to a depth that can be determined only by the nature of the strata. I should adopt the method of first building a substantial bulkhead at least 3 ft. thick on a curve convex toward the face of the coal. While this work is being done, it will be necessary to make adequate provision for taking care of the water, and to do this, pipes or manholes should be laid in the bottom of the dam. When the work is complete, these pipes can be closed by a plug drawn into the opening from the inside by means of a chain and tightened by a screw or lever so as to make them water-tight.

Having completed this bulkhead, I would adopt the plan suggested by *Coal Age*, taking the additional precaution, however, of lining the inside of the bulkhead with a layer of horse manure or moss, which would greatly assist in preventing leakage through the dam. Depending largely on the strength of the bulkhead already built, I would make the concrete wall on the inside of this bulkhead, say, 24 in. at the bottom with a less thickness at the top. I would employ a mixture of one part cement and two parts fine sand, with sufficient water to enable the concrete or grouting to be handled readily.

If there is not sufficient room at the face of No. 4 room to give a good foundation for the dam, it will be necessary to build good dams across the left-hand crosscuts in No. 4 room and the right-hand crosscuts in No. 5 room. Anon.

——, Penn.

[The foregoing letter was unsigned. The plan of building a dam from room pillar to room pillar, as described by this correspondent, is certainly a precarious one. The suggestion made in *Coal Age*, page 646, was to grout in, solid, the faces of rooms 3, 4 and 5, and others if necessary, which could only be determined by test boreholes drilled in the face of each of the rooms in this block of coal.

We would suggest that, under the assumed head of 100 ft., no actual dam would be safe built across the face of a room 40 ft. wide. As has been suggested, however, it is very probable that there is no great head of water to be encountered in this case, since the formations are generally level. But, by building up the faces of all rooms, where it is found to be necessary, with solid concrete, as we suggested, to a depth of 8 or 10 ft., there should be no further danger from the water breaking through into the live workings.

Of course, no further work can be done in this section of the mine without keeping boreholes a considerable distance in advance of the working faces. If possible, the water should be drained from the abandoned mine and an investigation made to find the extent of the workings in that mine.—Editor.]

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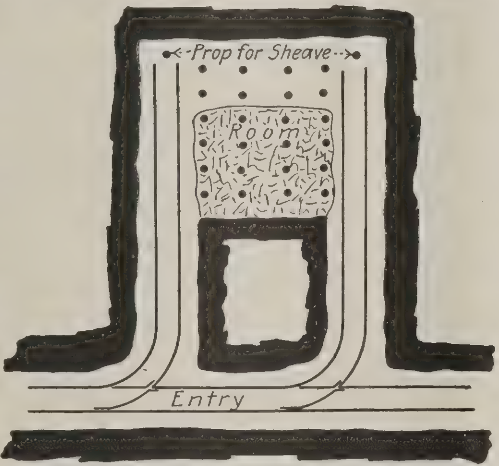
Handling Cars on Pitches

Letter No. 1—The inquiry on this subject by "Mine Superintendent," *Coal Age*, Oct. 23, p. 687, is so thoroughly answered by the editor that there is not much to say in addition. But as I have had some experience with double-track, gravity or self-acting planes in rooms and believe they can be used successfully on any pitch over 5 deg., I may be able to offer some practical suggestions.

Instead of using a piece of chain or cable to fasten the sheave clevis to the prop, I have used a solid ring, which the blacksmith can make in a few minutes of round iron or scrap if it can be found. This ring should be large enough for any prop and is slipped over the bottom of the prop before setting it.

Instead of using a single sheave, which necessitates the tracks being close together and does not permit of the car being pulled up close to the prop, I would suggest driving the rooms double, as shown in the accompanying illustration, and laying each track along the rib. Then set a post for a sheave at the head of each track and extend the rope along the face of the room between the sheaves. This will allow each car to be hauled closer to the face and also lessen the distance it is necessary to handle the coal when loading. If roof conditions will permit, the rooms can be driven 40 ft. wide.



SELF-ACTING INCLINE IN A DOUBLE ROOM

When drawing back the pillars, in this system, the pillar should be cut through from each side, at the face, before changing the rope. Then the rope should be carried across the face of the room and made to operate the cars on each side of the pillar, which avoids the gob or waste stored in the center of the room. Where thick pillars are used and there is much gob, the advantages of this track arrangement will be obvious.

I would also suggest the use of thimbles and clips to fasten the rope to the clevis on each end, thus lessening the wear on the rope and breakage of strands and keeping the rope from getting tangled and kinked, besides permitting it to be lengthened easily and quickly, as the room advances. The surplus rope should be neatly coiled and tied and hung on the end of the car, otherwise it may give trouble. Where sufficient rope to work out a room will make too bulky or cumbersome a coil when the room is being started, different lengths of rope can be used, starting with, say 75 or 100 ft.; and when this is run out, either splicing on another piece of about the same length or moving the short piece ahead to a new room and putting on a piece 175 or 200 ft. long, etc.

I would caution "Mine Superintendent" by saying that my experience has been that this system will not work itself, especially at the start, but must be given considerable attention. The men must be thoroughly trained and instructed in its use and then watched to see that they follow instructions, for it has failed in a number of instances when the system has been misused.

On one occasion, for example, I gave instructions and provided material for the installation of this system in some rooms, in a mine under my control. Shortly after, I was advised by the local superintendent that it would not work and, on inquiring the reason, was told that everything was wrong with it and nothing right and it simply would not work. On personal investigation I found that the necessary material was furnished the miners, but no effort at all had been made to instruct them in its use or to see that it was properly used and kept up.

When the car in the room was loaded and the empty car in the neck attached to the rope, the loaded car was turned loose. No attempt being made to brake or sprag the car, it ran down the incline, jumped the track and ditched in the entry. The empty car, on the other end of the rope, at the same time, was dragged at full speed into the prop to which the sheave was attached, car, prop rope and sheave landing crossways about the middle of the room. Moreover, no attempt was made to coil or otherwise care for the surplus rope, and it was tangled, twisted and dragged all over the room. When the cars had been started on their wild career, everybody in the vicinity had to run to keep from being picked up by the rope and carried along. Of course it wouldn't work. But after a little time and patience had been used in instructing, training and watching the men, no further trouble was had with the arrangement, and it has since worked well.

EDW. H. COXE.

Knoxville, Tenn.

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Mine Discipline Imperative

Letter No. 2—A recent editorial on this subject, *Coal Age*, Oct. 2, p. 552, is full of pertinent matter suggesting much thought. I advise everyone who has missed this article to look up his back number of *Coal Age* and read the same.

My personal opinion is that the definition of the word "discipline," as conceived in the good old days, is undergoing somewhat of a change at the present time. Indeed, my observation convinces me that this is a fact. The reason for this gradual change in the popular idea of discipline may perhaps be ascribed to the development of the safety-first idea and in part to the evolution of that dire word "efficiency."

Safety first is a grand thing, and it is little wonder that so many companies today hold it in high esteem. It is in fact a great incentive to permanence, progress and prosperity in the industrial world. The phrases, "safety first" and "stand out from under" are strangely illuminated expressions and demand strict compliance with the mandates. Surely our ideas of discipline are changing, and there is a reason.

Observe, for instance, that throughout this wide land the attitude of capital as represented by its management toward that necessary giant, Labor, is manifestly one of caution and doubt, combined with a certain respect of the one for the other. To illustrate: When a child gets to the point where he begins to talk back—when parental discipline is met with sullenness and anger instead of remorse and penitence, then indeed it is time for the parent to sit down and carefully consider his methods of dealing with the insubordinate child.

Applying this simile to the industrial world, the time has come for reflection on the methods to be employed in dealing with labor problems. If respect, obedience and confidence are to be retained, something else must be substituted for the peremptory demands, chastisement and force formerly used in maintaining discipline. The employer and employed alike are coming to realize and grasp the spirit exemplified in the saying, "Let us sit down and reason together."

Efficiency! Did you ever hear that inscrutable word before? What a meaning it conveys in the efforts being made today for betterment. But even yet, if the word is merely whispered in their presence, some managers will act in a very strange manner and display a rough, unapproachable exterior. Nevertheless, "Efficiency" is the slogan. No other term can take its place or convey the same meaning. Its transformations are magic.

Both discipline and the disciplinarian have been carefully inspected by this guardian of progress, Efficiency. Motion pictures have been made of the tracklayer at work, and these have been carefully studied with the result that disciplinarians have been gradually transformed into men of another type. Their heads are longer and their necks are not as thick as formerly. They lack nothing in physical courage. Today, however, the disciplinarian admits that he cannot lick the tracklayer if it comes to a mix, and as a consequence they do not mix. Better results are accomplished by other means and methods. Is it strange that costs of production are lower and there are less tension and fewer accidents—less noise and confusion and sweat? In fact, there is better discipline in the mines of today. Look up the meaning of the word in Webster's Unabridged Dictionary.

Carson W. Smith,
The Consolidated Coal and Coke Co.
Dacona, Colo.

Study Course in Coal Mining

By J. T. Beard

The Coal Age Pocket Book

Metric Abbreviations—The following are the common abbreviations used in the metric system:

Milligram, mg.; millimeter, mm.; milliliter, ml.
Centigram, cg.; centimeter, cm.; centiliter, cl.
Decigram, dg.; decimeter, dm.; deciliter, dl.
Gram, g.; meter, m.; liter, l.
Kilogram, kg.; kilometer, km.; kiloliter, kl.

Square millimeter, mm^2; cubic millimeter, mm^3.
Square centimeter, cm^2; cubic centimeter, cm^3.
Square decimeter, dm^2; cubic decimeter, dm^3.
Square meter, m^2; cubic meter, m^3.
Square kilometer, km^2;

Compound Units—It is often convenient to express values involving two or more denominations in terms of a single compound unit. The following are examples of such compound units:

Work is expressed as a force (pounds) exerted through a distance (feet) and its unit, therefore, combines both of these denominations, giving foot-pounds (ft.-lb.), or inch-pounds (in.-lb.), as the case may be.

Power is expressed as work performed per unit of time, as foot-pounds per minute (ft.-lb.p.m.), or per second (ft.-lb.p.s.).

In like manner, the speed of rotation is given in revolutions per minute (r.p.m.); or the speed of a train as miles per hour (mi.p.hr.); or the velocity of an air current as cubic feet per minute (cu.ft.p.m.).

It is common to estimate the value of coal lands in tons per acre, or **acre-tons**; or to express the amount of underlying coal in **acre-feet**, which combines in a single unit both the acreage of the seam and the average thickness of the coal in feet.

CONVERSION TABLES

Numerous forms of tables are in use for converting denominations of the United States system into the corresponding denominations of the metric system and vice versa, but the following are believed to best serve the purpose. For the sake of more ready reference, the denominations of weight, length, area, volume and capacity are here given in separate tables, and the values given in the tables are simple multipliers:

AVOIRDUPOIS (METRIC TO U. S.)

		Drams	Ounces	Pounds	Tons
1 milligram	=	0.00056			
1 centigram	=	0.0056			
1 decigram	=	0.0564			
1 gram	=	0.564	0.035	0.0022	
1 decagram	=	5.644	0.353	0.022	
1 hectogram	=	56.438	3.527	0.220	
1 kilogram	=	564.38	35.274	2.205	0.0011
1 myriagram	=			22.046	0.0110
1 quintal	=			220.46	0.1102
1 tonne	=			2204.62	1.1023

When closer determinations are desired the values given in the metric tables should be employed.

The Coal Age Pocket Book

AVOIRDUPOIS (U. S. TO METRIC)

		Milligrams	Grams	Kilograms	Tonne
1 dram	=	1771.8	1.77		
1 ounce	=		28:35	0.02835	
1 pound	=		453.59	0.4536	
1 ton	=			907.184	0.90718

TROY (METRIC TO U. S.)

		Grains	Penny-weights	Ounces	Pounds
1 milligram	=	0.0154			
1 centigram	=	0.154	0.006		
1 decigram	=	1.54	0.064	0.0032	
1 gram	=	15.43	0.643	0.032	
1 decagram	=		6.430	0.322	0.0268
1 hectogram	=		64.302	3.215	0.2679
1 kilogram	=			32.151	2.679
1 myriagram	=				26.79

TROY (U. S. TO METRIC)

		Milligrams	Grams	Kilograms
1 grain	=	64.8	0.065	
1 pennyweight	=		1.555	
1 ounce	=		31.103	0.031
1 pound	=			0.373

APOTHECARIES (METRIC TO U. S.)

		Grains	Scruples	Drams	Ounces	Pounds
1 milligram	=	0.0154				
1 centigram	=	0.154	0.0077			
1 decigram	=	1.54	0.077	0.026		
1 gram	=	15.43	0.772	0.257	0.032	
1 decagram	=		7.72	2.57	0.322	
1 hectogram	=				3.215	0.268
1 kilogram	=				32.15	2.679

APOTHECARIES (U. S. TO METRIC)

		Milligrams	Grams	Kilograms
1 grain	=	64.8	0.065	
1 scruple	=		1.296	
1 dram	=		3.888	
1 ounce	=		31.103	0.031
1 pound	=			0.373

LINEAR (METRIC TO U. S.)

		Inches	Feet	Yards	Rods	Miles
1 millimeter	=	0.039				
1 centimeter	=	0.39	0.033			
1 decimeter	=	3.94	0.33			
1 meter	=	39.37	3.28	1.094	0.199	
1 decameter	=		32.81	10.936	1.988	0.0062
1 hectometer	=			109.36	19.884	0.0621
1 kilometer	=					0.6214
1 myriameter	=					6.2137

The old surveyor's chain (66 ft.) contains 20.1168 meters, and one kilometer (3280.83 ft.) is 49.71 of such chains.

Inquiries of General Interest

An Electrical Transmission

Will you kindly answer the following question: What size of wire will be required to transmit the power necessary to operate three 30-hp. motors located at a distance of 4,000 ft. from the distributing point? These motors are rated at 105 amp., and we have 250 volts direct current at the switchboard. A. N. Young.

Masontown, Penn.

Correspondent has not given sufficient information to enable us to give a wholly satisfactory answer to his question. Assuming, however, that these 30-hp. motors have an efficiency of, say, 90 per cent. and that each motor takes a current of 105 amp. in developing this power, the voltage to be delivered to the motors will be

$$E = \frac{30 \times 746}{0.9 \times 105} = 236\ \mathit{volts}$$

If this is the voltage to be delivered to the motors, there is a permissible line drop of 250 — 236 = 14 volts.

The proposition on this basis is therefore to transmit a current of 3 × 105 = 315 amp. a distance of 4,000 ft., with a line drop of only 14 volts. Allowing for a wire return, the area in circular mils required for this transmission is

$$A = \frac{21.6 \times 4{,}000 \times 315}{14} = 1{,}944{,}000\ \mathit{circ.mils}$$

Since 1 circ.mil is the area of a circle 1 mil in diameter and a mil is one-thousandth of an inch (0.001 in.), the diameter of wire required in this case is

$$d = \sqrt{\frac{1{,}944{,}000}{785{,}400}} = 1.57\ \mathit{in.}$$

This would make a very expensive installation, and we would suggest that the most feasible alternative is to employ a higher switchboard voltage that will permit a greater line drop. By raising the voltage at the switchboard to 275 volts, the permissible line drop would be 275 — 236 = 39 volts. There would then be required

$$A = \frac{21.6 \times 4{,}000 \times 315}{39} = 697{,}850\ \mathit{circ.mils}$$

The diameter of this wire would then be

$$d = \sqrt{\frac{697{,}850}{785{,}400}} = 0.94,\ \mathit{say}\ \tfrac{15}{16}\ \mathit{in.}$$

Owing to the high cost for copper required for this work, it would have been much better to have employed alternating instead of direct current. This would have made it possible to introduce transformers and "step up" the voltage to any desired pressure, for the purpose of transmission. By this means a smaller wire could be used and the copper cost greatly reduced.

It is possible to install at the power house a motor-generator set and change the direct current of the generators into alternating current for transmission. That, however, would not be a commercial proposition. What should be done, in this case, is to discard the present direct-current machines and in their place install alternating machinery capable of generating current at, say 2,300 volts; transmit this current to the point of distribution and there convert the alternating current into direct current by means of a motor-generator set.

Mine Gases Known as "Damps"

At a recent meeting of mining men the question was asked, "Why do the miners refer to mine gases as 'chokedamp,' 'blackdamp,' 'whitedamp,' etc.?" I would like to know if you can answer that question, stating when and how this term came to be used in respect to mine gases.

Landgraff, W. Va. Thomas Norris.

The term "damp" is of Dutch, Danish or low-German origin, corresponding to the German *dampf* and meaning a vapor or fog. The term was applied in the earliest days of mining when the miner first became conscious that mine air contained noxious gases of which he had little or no knowledge.

Later, as the characteristics of the different mine gases became known, the miner designated them according to their observed effects. The general term "stonedamp" was applied more or less generally to all the mine gases, as coming from the rock strata.

Carbon dioxide (CO_2), mixed with more or less nitrogen as the result of the different forms of combustion constantly taking place in the mine, was designated by the terms "blackdamp" or "chokedamp," because of its choking effect, these gases being irrespirable and producing suffocation.

Carbon monoxide (CO) has been generally termed "whitedamp," probably because of its prevalence in low, damp and poorly ventilated places, where a fog or mist is often to be observed in the mine. It is not to be inferred by this that carbon monoxide is visible, but that it received the name of "whitedamp" because of its association with such places, the fog being mistaken by the early miner for this deadly gas.

Marsh gas mixed with air in inflammable or explosive proportions was naturally termed "firedamp," while the deadly gaseous products remaining after an explosion in the mine were termed "afterdamp."

Sulphureted hydrogen (H_2S) received the name of "stinkdamp," because of its nauseating smell, which resembled that of rotten eggs.

These terms will be found fully explained in the chapter on "The Common Mine Gases," in "Mine Gases and Explosions," Beard. Some confusion exists in respect to the correct meaning and application of the two terms "blackdamp" and "firedamp." Blackdamp is often taken to refer to carbon dioxide (CO_2), whereas it was properly and originally applied to the extinctive products of combustion, consisting of a mixture of nitrogen and carbon dioxide. The term "firedamp" originally described an inflammable or explosive mixture of mine gases consisting chiefly of methane (CH_4) and air. The mixture must be such as to inflame or explode in contact with flame.

Examination Questions

West Virginia Examinations, Oct. 26-28, 1915

(*Selected Questions*)

Ques.—In driving entries or rooms that are known to liberate explosive gases, what precautions would be necessary to insure the safety of the workmen?

Ans.—Only safety lamps should be used in this work. A good current of air should be directed well into the face of the entries or made to sweep the faces of the rooms. To do this, it may be necessary to erect lines of brattice extending to within a few feet of the working face. The brattice should be so placed that the intake air will pass up behind the brattice on its way to the face. The safety lamps must be closely watched to observe the first indication of any increase in the amount of gas present in the air. Where gas is coming from the roof, special attention must be given to the timbering in order to prevent undue roof falls, which might liberate a large quantity of gas suddenly. Where the coal is blasted, only permissible powder should be used and moderate charges employed. All shots should be inspected and fired by competent shotfirers, and tests should be made for gas in the place where a shot is to be fired and in the adjoining places before setting the blast.

Ques.—Would you consider it safe to work with open lights in any portion of a mine liberating explosive gases?

Ans.—This question is one of growing importance in coal mining; it is the old question of using mixed lights in a mine generating explosive gases. While many such mines are worked with mixed lights at the present time, the practice cannot be said to be commonly safe. There are many unforeseen conditions that may arise that would render the presence of open lights in any part of the mine exceedingly dangerous. It is well known that the flow of gas from rock strata is not uniform. At times heavy gas feeders are encountered that quickly overcharge the mine air in those sections of the mine where the gas is liberated. Also, the flow of gas is spasmodic. It frequently happens that sections of the mine that have not been troubled with gas for some time suddenly become gaseous. This may be due to a squeeze occurring in the gaseous section, and although the effect may hardly be appreciable in the working of the coal, it would endanger the open-light section.

A heavy fall of roof occurring in the safety-lamp section might cause an outflow of gas from that section onto the roads and into the workings of the open-light section. Any derangement of the circulation, owing to the failure of the ventilator or the setting open of a door, would menace the entire mine. Perhaps the greatest danger in the use of mixed lights is the possibility of a driver or other employee inadvertently carrying an open light into places where gas is being generated. It frequently happens that open lights are permitted on the airways of a mine, while only safety lamps are allowed at the faces of the rooms. This practice is exceedingly dangerous and should never be permitted.

Ques.—What is a safety lamp?

Ans.—As this term is understood in coal mining, a safety lamp is a gauze-protected lamp; that is to say, a lamp provided with a wire-gauze chimney of approved construction and in which all openings for the admission of air to the lamp are covered with wire gauze to prevent the passage of flame from within the lamp to the outside atmosphere.

Ques.—How is a safety lamp constructed, and for what purpose is it used?

Ans.—There are two general classes of safety lamps, designed respectively for testing for gas and for working at the face. The favorite lamp for testing for gas has always been the unbonneted Davy. This lamp consists of an oil vessel surmounted by a wire-gauze chimney about 1½ in. in diameter and from 4 to 4½ in. in height. The standard wire gauze is composed of a mesh of 28 wires to the inch and contains 784 openings per square inch. The gauze chimney is secured firmly to the oil vessel and is surmounted by a gauze cap or "smoke gauze" as it is commonly called, its purpose being to give added protection at the top of the chimney where there is the greatest danger of the lamp passing flame.

The safety lamp designed for work at the face is provided with a glass chimney, which surrounds the flame and is surmounted by a shorter gauze chimney that is generally of a slightly conical shape. The gauze chimney may or may not be provided with a metal shield called a "bonnet." This form of working lamp, known as the Clanny type, is shown in the accompanying figure. The glass chimney affords a better light for the workmen and gives an added protection against strong air currents. The lamp, however, is not as sensitive to gas as the Davy, which has an entire gauze chimney.

BONNETED CLANNY

The purpose of the safety lamp is to permit men to work with safety in an atmosphere containing an inflammable mixture of gas and air in which an open light would be dangerous. When a safety lamp is introduced into a body of gas, the gas-charged air entering the lamp will burn within the chimney, but the flame will be prevented from passing through the gauze by the cool metal. The small streamlets of gas passing outward through the mesh of the gauze become cooled below the point of ignition of the gas, so that the flame is extinguished.

Ques.—When is a safety lamp unsafe?

Ans.—A safety lamp is unsafe when handled by an inexperienced person, or in a careless manner, or when the lamp is exposed for too long a time to an inflammable atmosphere. The gauze of the lamp then becomes sufficiently heated to allow the passage of flame through the mesh of the gauze.

Book Reviews

Electrical Engineers' Handbook

STANDARD HANDBOOK FOR ELECTRICAL ENGINEERS, Prepared by a Staff of Specialists. Frank F. Fowle, Editor-in-Chief. McGraw-Hill Book Co., Inc., 239 West 39th St., New York City. Leather, 4¼x6¾ in. pp. xvi + 1916 + an index of 68 pp. Several illustrations. Fourth Edition. $5, net.

Prof. T. Hudson Beare, of University College, London, believed in the use of textbooks in examinations and used to say that there were two essentials of an engineer's education—to know where to find things and to know how to use them when found. For electrical engineers this handbook removes the first difficulty. The expert must still, as always, overcome the second by his own experience and native ability.

To make the book easy of reference there is not only an excellent index, but also in the covers is a separate general numbered classification of the subjects contained, the numbers being placed in thumbholes on the margin of the book as the letters of the alphabet are disposed on the edge of a dictionary. This makes it easy to refer to any subject.

Thus section No. 1 devotes 151 pp. to "Units, Conversion Factors and Tables." It is written by Arthur E. Kennelly, professor of electrical engineering, Harvard University and Massachusetts Institute of Technology. Section No. 2 is on "Electric and Magnetic Circuits" and is written by Vladimir Karapetoff, professor of electric engineering, Cornell University. Some of the sections have many authors where the information contained in them is of a specialized nature and is not part of the common practice and use of the whole profession. Thus "Miscellaneous Applications of Electricity" has no less than 12 contributing editors.

The "Standardization Rules of the American Institute of Electrical Engineers" forms one section and "General-Engineering Economics and Central-Station Economics" another. In the latter the reader will find much to instruct him as to the many methods of determining the load factor for central-station charges. The purchaser of power from public-service corporations to operate his mines should be well posted as to the nature of such contracts.

The subject of "Coal- and Ore-Handling Machinery" falls to C. D. Gilpin, electrical engineer for the Wellman-Seaver-Morgan Co. Graham Bright, engineer of the mining department, Westinghouse Electric and Manufacturing Co., writes briefly (6½ pp.) on "Coal Mining." There is, of course, but little about the application of electricity to coal transportation and production. It has more, however, than Trautwine or Kent, which are reference books of like character. Yet no mining engineer can afford to be without either of these, and he will do well to provide himself with this book, which perhaps we may name "Fowle," though the editor-in-chief modestly refrains from giving his name such publicity, realizing that he is rather the assembler of the parts than the mechanician who constructed them.

The coal-mine operator will read and refer with interest to the sections on "Direct-Current Generators and Motors," "Alternating-Current Generators and Motors," "Converters and Double-Current Generators," "Power Plants," "Power Transmission," "Distribution Systems" and "Batteries."

The reader who has Trautwine and Kent is apt to fear that in getting an electrical manual he will be purchasing a large amount of material in duplication of what appears in those books, but if he should invest in Fowle he will find he has a book closely confined to its exclusive field, the exception being 110 pages on power plants. There are only eight pages in all given to natural sines and cosines, logarithms and hyperbolic logarithms. Because a few people are ill-equipped with tables in easily portable form every engineering author seems to delight in adding to his book a series of tables which are all very useful in their way, but are useless and "in the way" most of the time. Our eight-foot book shelves of engineering classics might be trimmed over a foot if redundancies such as these were eliminated.

Another unfortunate tendency is to teach in such textbooks mathematics, elementary and advanced, chemistry, mechanics and physics. As a result, such treatises are so extensive in scope that no attempt can be made to make them complete. Mr. Fowle avoids this fault admirably, and the book will stand the closest inspection.

A Directory of Coal Operators and the Supply Trade

THE COAL FIELD DIRECTORY AND MINING CATALOGS OF COAL MINING EQUIPMENT FOR THE YEAR 1915. Second Edition. Keystone Consolidated Publishing Co., Inc., 6th floor, House Building, Pittsburgh, Penn. Cloth boards, 9x12½ in.; 656 pp. illustrated.

This directory of operating companies and of the concerns supplying their wants meets the needs of both parties and has a hearty welcome from the public. It was the intention of the reviewer to refrain from praise this year because last year he stated, "In it [the Coal Field Directory] is added an exceptionally valuable addition of 17 pages, cataloging mines by counties, so that traveling men and managers who wish to district their work will receive no little assistance in so doing."

It seemed a risky matter to applaud anything in the book because what was singled out for express approval last year was for some reason omitted in the present edition. But it appears that in future issues this valuable adjunct will not be omitted. It serves several purposes. Granted that we know the town and county in which an operation is located, it is easily possible in that department of the book to find the names of all the concerns operating in that place and by a process of elimination to ascertain the firm regarding which information is wanted.

It is sometimes necessary to find all the concerns mining coal in a certain field, and even the state mine reports which are almost always based on districts of inspection are far less available than the "Blue Book." So the reviewer trusts this important feature will be restored in 1916. He will undertake not to charm it away by needless praise. Regret must also be expressed that the authors have seen fit to eliminate the list of inspectors formerly printed on the last page of the book. Nowhere else was such a complete list of these public functionaries obtainable.

The book has almost 92 more pages than last year. The catalog material is more complete than ever, and the selection of information in this part of the volume is good. As the matter is of an encyclopedic character it is well-suited for reference. If a beginner were asked where to find information about mining machinery and equipment, he might well be recommended to peruse the directory, so closely does it approximate to a textbook in its manner of presentation; and to complete the resemblance, several pages of nonadvertising free information have been added by the manufacturers. It has been rightly said there are few people who know machinery and equipment better than the man who makes them.

The Coal Field Directory is remarkably complete. Fewer and fewer companies are withholding information. If the company's directing heads and manner of operation are not given, it is almost an infallible sign that its affairs are not worth chronicling. In small, condensed type without unnecessary syllables we find the names of the operating and store company, the president, treasurer, secretary, vice-president, general manager, purchasing agent, general superintendent, mining engineer, mine superintendent, mine foreman, consulting engineer, electrical engineer, master mechanic and store manager, with their addresses. The name of the mine, its freight station or stations, the railroad or railroads reaching the town, the county, the system of hauling and of mining, the number of boilers used, their rating and type, and the number of employees and coke ovens, details as to the pumps installed and the generating units, the voltage of the current, the number of air compressors and the tonnage last year are all given. It is really a remarkable compendium of mining information.

The reviewer trusts that in coming editions this useful book will develop rather than decrease its cross-indexing. When the last stage of completeness is reached, the mining officials will be indexed so that their affiliations may be readily traced. An important man is often better known than his company connection, and it is frequently useful to be able to trace the points where men of lesser importance are to be found. An index of officials which will enable the public to do this will be of much value to mine operators, especially if such a list is accompanied by the addresses of the persons listed so as to form a personal directory.

Coal and Coke News

Harrisburg, Penn.

The recent announcement by Chairman Robert K. Young, of the State Workmen's Insurance Fund, that the rates would be 10 per cent. less than the approved rates in the insurance rate manual and that $5 would be the minimum premium is the beginning of the state's campaign in behalf of the fund for liability insurance.

In connection with this general announcement, the Board issues the following explanatory remarks.

The announcement of this approved rate reduction of 10 per cent. on all rates is a matter of much interest and concerns all employers of labor in the State of Pennsylvania.

The law creating the fund requires that the premium rate shall be fixed at the lowest amount consistent with the maintenance of a solvent fund and the creating of an adequate surplus and reserve. The fund pays no commissions or agents and does not have to earn profits for stockholders, and for the first three and one-half years the entire expenses of the management are paid by the state. The elimination of these expenses is sufficient to allow the board to write insurance at this reduced original rate. The balance remaining which may be applicable on the basis of an average experience also gives every prospect of returning a very substantial rebate in dividends to subscribers at the end of the year so as to bring the cost of the insurance in the state down to a much lower basis.

They may obtain their compensation insurance in the state at a rate lower than that charged by the stock and mutual companies, and also will receive the benefit of aditional advantages which cannot be obtained by other forms of insurance. Employers insuring in the state fund can obtain a complete release of their personal liability and full protection of their property against compensation liens. If the subscriber to the fund makes the report of an accident within 7 days, his liability ceases and is transferred automatically to the fund, so that no valid lien can be filed against the property of an employer insuring in it. Every other form of insurance leaves the employer personally liable, so that every agreement or award of compensation may be entered as a lient against his real estate wherever situated within the state, and this lien cannot be discharged until the whole compensation agreed upon or awarded has been paid in full. In serious cases this compensation will run for a number of years, during which period the lien must remain as a cloud upon the employer's property.

There is also an advantage to subscribers in the state fund that there will be no contingent liability to assessments to which all employers insuring in mutual associations are subject. The purpose of the act was to make the payment of the premium the sole liability to subscribers, and no assessment will be levied in any case, as there is not one word in the act creating the state fund that directly gives or by implication suggests the right of assessment.

The state fund will provide insurance at net cost, and by the elimination of the operating expenses which other companies must pay out of their premiums it is reasonable to assume that the state can furnish complete protection under the new law at a price below that of other insurance.

In the announcement of $5 as the minimum premium the board has solved the problem which has been confronting the small employer with one, two or less than five employees engaged in occupations of a minor hazard. This amount was decided upon as an attractive inducement to the small employer to insure in the state fund, as it was apparent that it would be necessary to issue the insurance for the small employer at a price which would not burden him. The employer will have the same complete protection and release from liability as the regular policy, and it is intended to encourage the acceptance of the workmen's compensation act by the employers whose estimated payroll is of an amount where the individual classifications are not computable at a rate which would exceed the minimum figure. It is probable that this minimum adopted by the state fund is less than the other companies will desire to issue policies to employers who would come within the minimum limits.

Petition for Re-argument

Attorney-General Brown recently, filed a petition in the State Supreme Court asking for a re-argument in the anthracite coal tax case. The Court recently decided that the law of 1913, levying a tax on hard coal was unconstitutional. Eleven reasons are given for another review, among them being that the opinion of the Supreme Court is "contrary to all precedent in Pennsylvania, because it is the first time in the history of the jurisprudence of the state that classification for the purpose of taxation has not been sustained"; and that it "is the first time in the history of Pennsylvania, or elsewhere in the United States, so far as counsel are advised, that where a classification has been sustained for one purpose the same classification has not been sustained for purposes of taxation."

The logic of the opinion of the Court the petition further says, "that there is no reason for taxation, because 40 per cent. of anthracite coal is in competition with bituminous," will lead to a denial of the right to classify coal, oil and other fuel for taxation because it comes into competition with coal.

With regard to the distribution of the tax which the supreme court declared contrary to the constitution, the petition says: "Even if it be true that the provision for partial distribution among counties is unconstitutional that furnishes no reason for striking down the tax. The two matters are so separate and distinct that the tax may be sustained though the distribution provided for be forbidden."

The offer of the Philadelphia & Reading Coal and Iron Co. and other smaller firms to refund to the wholesalers money they collected as state tax on anthracite will be opposed by the state authorities, it is said here.

The filing of the information in escheat with the Auditor-General of the state by an attache of that department prevents any one benefitting from collections of the alleged "unclaimed fund."

In many instances the coal operators sold coal to wholesalers with the exact amount due because of the tax set forth on their bills. These companies will have no trouble in determining what amount should be paid over. The state's interest in the matter will go further, as Auditor-General Powell will compell the wholesalers to show that they have returned the money to their customers.

PENNSYLVANIA

Anthracite

Lansford—A. Carl Neumiller, chief forester for the Lehigh Coal and Navigation Co. is planting one shade tree in front of each dwelling owned by the company in this town.

Sunbury—Coal in the Susquehanna River, between here and Nanticoke, is virtually exhausted for this year. Fifty thousand tons were removed last summer.

Girardville—The McTurk Colliery, operated by the McTurk Coal Mining Co., has resumed operations, giving employment to hundreds of men and boys.

Tamaqua—As the result of a button strike 2,000 miners in the collieries of the Lehigh Coal and Navigation Co. in the Panther Creek Valley were recently thrown out of work.

Summit Hill—At the present time the Lehigh Coal and Navigation Co. has 7 mine locomotives and 3 steam shovels in constant operation in its endeavor to stop the 60-year old fire in the coal deposit of this district. A cut over 200 ft. deep is being made under the lower level and it is the intention to use this opening to drive the fire to the surface with air currents, while extensive sluicing operations are continuing from the top. It is the intention of the company to expend if necessary $1,000,000 in order to quench the fire for all time.

Hazleton—In the course of stripping operations near the Honey Brook No. 1 colliery of the Lehigh & Wilkes-Barre Coal Co. the deposit was found to be on fire. This is believed to be a continuation of a fire which was thought to have been extinguished in 1880. In order to extinguish the fire a pipe line over a half mile in length has been laid, which will carry a slush mixture of ashes, culm and dirt.

Lykens—Old timber in the lower gangway of the Short Mountain Colliery recently caught fire in some unknown manner and was extinguished only after three days and nights of continuous labor. Operations at this colliery have been resumed.

Bituminous

Connellsville—Religious holidays, carefully observed in the coke region by foreign workers, cut down coke production recently in spite of the fact that 400 ovens, which had been idle for a long time, were again placed in operation. The 31,000 active ovens have a weekly capacity of approximately 450,000 tons, if properly speeded up. Merchant operators have 80 per cent. of their ovens in use, while the furnace interests without the recent addition of idle ovens, are operating to 81 per cent. of their capacity.

Central City—A shortage of miners is causing much trouble for the coal operators in this vicinity as well as Cairnbrook. The Lochrie mines are especially hampered because of the shortage of men. The Pennsylvania R.R. is to extend its line from Cairnbrook into the coal fields here. Much activity is expected in these new fields in the spring and it is realized that better shipping facilities will be necessary.

Uniontown—Announcement has been made that J. Blair Kennerly, of Philadelphia, has taken a 15-year lease on the Ansbach coal mining property located on the Whites Creek Branch, about four miles above Confluence, Somerset County. The lease was obtained from the Girard Trust Co., of Philadelphia, trustee for the Fred J. Ansbach estate, with all the improvements on the mine. The lease became effective Nov. 1. Work of mining will begin about Nov. 22 and will give employment to about 75 men. The mine contains a 4.5- to 5-ft. vein of C prime coal and the production is expected to average about 800 tons a day. The tract includes 550 acres. The mine, which has been idle for a year and a half, is self draining and is equipped with electric haulage and coal cutting machinery. Two additional side tracks and a shaker screen are being installed.

WEST VIRGINIA

Bluefield—Every available car of the Virginia & Southwestern, the Carolina, Clinchfield & Ohio, and the Norfolk & Western railways are apparently busy all the time, and an immense tonnage of coal is being moved to market. Many coke ovens throughout the nearby field have been lighted after long periods of idleness.

Huntington—A coal deal of considerable magnitude was recently closed in this city when the Mason Coal and Coke Co. sold a large tract of mineral land to the Cumberland Mountain Coal Co. of Charleston. The exact consideration in this deal has not been named, but it is understood to be in the neighborhood of $100,000. The coal land in question consists of 13,000 acres in Buchanan County, Va., and is tributary to the Norfolk & Western R.R.

Fairmont—The old Pierpont mine is blamed for the sinking of buildings, water lines and sewer pipes in this city. New brick buildings erected within a year have been ruined. A similar occurrence took place some years ago in another part of the town. This has now apparently reached a state of stability, and the buildings then damaged are being rebuilt.

The shaft to the coal in the Carolina mine of the Consolidation Coal Co. has been completed at 500 ft. The shaft at the Idamay mine is also nearing completion, and is expected to be finished at 480 ft. Loading is expected to begin at both of these mines by Jan. 1, and shipments will be made over the Baltimore & Ohio to the Western Maryland.

Dola—Practically all of the coal mines in the vicinity of Dola are running full time; even those which have been closed down for several months have resumed operations and old employees are back at work.

ALABAMA

Birmingham—A contract has been offered the State of Alabama by the Sloss-Sheffield Steel and Iron Co. for the use of state convicts to be worked in the Flat Top mines. This company is giving up the use of county convicts, but wishes to employ between 350 and 400 state convicts in the mining of coal and between 50 and 75 in keeping up the mines, the full number to be between 400 and 500 men.

TENNESSEE

Turley—The Turley Coal Co., R. O. Howard, Atlanta, Ga., president, has been placed in the hands of a receiver. The mine has been closed down and the property is for sale. The Central Bank and Trust Co. of Atlanta, Ga., holder of the first mortgage bonds, is the receiver.

KENTUCKY

Typo—A party of officials of the Louisville & Nashville R.R. recently went over the First Creek branch out from Typo through the First Creek coal field to determine whether to begin hauling coal from the different plants there, most of which are in readiness to begin shipping. Within two weeks shipments will start.

Hazard—The Blue Grass Coal Co. near here makes the announcement that it will be ready to start shipments from its new plant by Nov. 25. Mining work will be started within the next few days.

Barbourville—All the mines in the Cumberland Valley are now working full time and a good proportion of them are working night shifts. A full run through the winter is expected by the trade.

Whitesburg—Small operators of the Big Sandy territory and its tributaries east of here continue to complain of a car shortage and are said, in many instances, to be suffering from lack of cars. From the railroads, however, it is promised that plenty of cars will be supplied in the near future.

OHIO

Columbus—Ohio operators are almost unanimously opposed to reviving the interstate conference agreement in dealing with the wage question when it comes up for settlement after Apr. 1, 1916. The interstate conference agreement consisted of Ohio, Western Pennsylvania, Indiana and Illinois and had been in force for several years previous to the 1914 agreement. An informal meeting was held in Columbus recently when the question of reviving the interstate conference agreement was discussed. Letters were then sent out to oprators asking their views. Almost without exception operators believe that Ohio should treat with the miners' organization single handed.

INDIANA

Linton—Local capitalists interested in the strip mining industry have taken options on several hundred acres near Clark Station, 3 miles south of here.

Terre Haute—Dr. August F. Knoefel, of this city, has been in Washington to ask the bureau of mines to make further investigation into the mining industry of Indiana and to make an increase in government rescue equipment in the state. There is only one mine rescue car in Indiana. It is now in the Linton field.

ILLINOIS

Springfield—President Frank Farrington, of the United Mine Workers of Illinois, has issued a statement that union miners may belong to the state militia and directing that no man is to be expelled from the union because he is a member of the national guard. The announcement is the result of trouble recently at Hillsboro over the suspension of union miners for belonging to the militia.

New Baden—The miners employed at the New Baden Mine of the Southern Coal, Coke and Mining Co., after being on strike for a week, have returned to work on practically the same conditions as prevailed before the strike. The dispute was as to cars of coal that were run through without being weighed. The practice has been, when this occurred, to take the average weight of the cars sent up by the particular miner for the day and make allowance on that basis for the one that was not weighed. The miners objected to this method. After a conference of miners' officials with the company it was promised that a defective condition of the hoppers which prevented the weighing of all cars would be corrected as soon as possible, so that all coal could be weighed.

IOWA

Eldora—A new coal field has been discovered north of Eldora, Ia., and the coal is of sufficient thickness to permit of profitable working, it is said. Drilling has been in progress for several weeks and those in charge say that coal in workable measure underlies considerable territory north of Eldora, although the extent of the field has not been determined.

Des Moines—One of the first aid cars of the bureau of mines will arrive in Des Moines Nov. 21 and remain until Dec. 8. Notices have been posted at all coal mines in Iowa and northern Missouri. J. J. Forbes, in charge, will give first aid instructions. In addition to the miners it is expected factories and wholesale houses will send representatives. As the Des Moines field is large, Mr. Forbes will utilize the lecture rooms of the new Iowa Industrial Hospital in making demonstrations.

WYOMING

Frontier—Mine Rescue Car No. 5 of the United States Bureau of Mines, will be in Frontier from Nov. 14 until Dec. 4. Free lectures will be given to miners on safe methods of mining and the use of safety lamps and rescue apparatus will be explained. Miners will also be trained in rescue and first aid. Moving pictures will be exhibited showing good and bad methods of mining.

FOREIGN NEWS

London, England—Official notice was recently posted in all collieries stating that such a large number of miners have already joined the army that "the supply of coal which is of vital national interest is seriously affected." Coal miners will hereafter be accepted as recruits only on condition that they will continue to work in the mines until called upon. "The miners must one and all remember," the notice continues, "that upon their efforts the success of the country depends, no less than upon the men who are serving with the forces."

PERSONALS

D. P. Cary recently resigned from the presidency of the Lorain Coal & Dock Co. S. W. Braggins, sales manager, will act as president of this firm until a successor is named by the board of directors.

Frank A. Vanderlip has taken a position on the board of directors of the S. K. F. Ball Bearing Co. of Hartford, Conn. This firm has a paid up capital of $2,000,000 and will shortly erect a factory in Hartford.

J. D. Mooney has been appointed sales manager of the Commercial Department of the Hyatt Roller Bearing Co. In the past Mr. Mooney has been in charge of belting sales for the B. F. Goodrich Co., Akron, Ohio.

Harvey H. Morris, assistant superintendent of the Huntington & Big Sandy division of the Chesapeake & Ohio R.R., and one of the veteran officials of the system, recently tendered his resignation in order to become general manager of the West Virginia Standard Coal Co. This company was organized by Mr. Morris, and will have its general offices in Huntington.

William J. Jones, of Akron, N. Y., former mine and quarry inspector for the state and later state inspector of explosives in the State Fire Marshal's Department, has been appointed superintendent for the Berlin Smokeless Coal and Clay Mining Co. This firm will develop several hundred acres of coal and clay land in the vicinity of Macdonaldton, Somerset County, Penn.

W. F. Hyde has been employed by the West Virginia-Pittsburgh Coal Co. as a welfare expert and will devote a portion of his time to the employees of the company at Collier and Wellsburg. Mr. Hyde has been in charge of welfare work at Wheeling for several years, and is known locally and nationally for his community and welfare work. He will also do similar work among the employees of the Richland Coal Co., and the Hitchman Coal and Coke Co., of Wheeling.

OBITUARY

John Kennedy, of Pricedale, Penn., one of the oldest and best known mine foremen with the Pittsburg Coal Co., died recently at his home in Pricedale. Mr. Kennedy was 55 years of age and is survived by his wife, three sons, and three daughters.

RECENT COAL AND COKE PATENTS

Underfeed Furnace. R. S. Riley, Providence, R. I. 1,148,625 Aug. 3, 1915. Filed Oct. 20, 1911. Serial No. 655,822.

Gas Producer. W. O. Amsler, Pittsburgh, Penn. 1,149,611 Aug. 10, 1915. Filed Oct. 3, 1911. Serial No. 652,529.

Mining Machine. C. O. Palmer, Cleveland, Ohio. 1,149,215 Aug. 11, 1915. Filed Mar. 11, 1909. Serial No. 482,750.

Mining Machine. L. F. Hess, Ansted, W. Va. 1,147,724 July 27, 1915. Filed Nov. 21, 1914. Serial No. 873,313.

Coke Conveyor. D. F. Lepley, Connellsville, Penn. 1,142,895, June 15, 1915. Filed Sept. 18, 1914. Serial No. 862,392.

Gas Producer. P. G. Schmidt, Olympia, Wash. 1,142,914, June 15, 1915. Filed Mar. 29, 1913. Serial No. 757,671.

Mechanical Stoker. G. B. Rait, Minneapolis, Minn. 1,149,685 Aug. 10, 1915. Filed Apr. 10, 1914. Serial No. 830,878.

Apparatus for Separating Coal. F. Pardee, Hazleton, Penn. 1,149,463 Aug. 10, 1915. Filed May 2, 1913. Serial No. 765,170.

Pulverized Coal Burner. N. L. Warford, Anaconda, Mont. 1,147,833 July 27, 1915. Filed Dec 5, 1914. Serial No. 875,665.

Gas Producer for Furnaces. W. O. Houston, Bellaire, Ohio. 1,149,056 Aug. 3, 1915. Filed Feb. 9, 1914. Serial No. 817,384.

Mechanical Stoker for Locomotive. E. Young, Pony Lake, Neb. 1,148,735 Aug. 3, 1915. Filed Oct. 25, 1913. Serial No. 797,226.

Mechanical Fuel Feeding Apparatus. I. Stordahl, Miles City, Mont. 1,144,156, June 22, 1915. Filed Feb. 8, 1915. Serial No. 6949.

Fuel Saving Attachment for Furnaces. N. J. Russell, Chicago, Ill. 1,150,456 Aug. 17, 1915. Filed Mar. 12, 1915. Serial No. 14,018.

Mining Machine. H. A. Kuhn and W. W. Macfarren, Pittsburgh, Penn. 1,148,973 Aug. 3, 1915. Filed Jan. 2, 1909. Serial No. 470,292.

Mining Machine. C. E. Davis, assignor to Goodman Mfg. Co., Chicago, Ill. 1,149,502 Aug. 10, 1915. Filed Jan. 13, 1911. Serial No. 602,386.

Mining Machine. L. F. Hess, assignor to Hess Dustless Mining Machine Co. 1,143,599, June 15, 1915. Filed Mar. 26, 1912. Serial No. 686,287.

Mining Machine. F. L. Sessions, assignor to Jeffrey Mfg. Co., Columbus, Ohio. 1,143,144, June 15, 1915. Filed Feb. 16, 1909. Serial No. 478,201.

Automatic Releasing Device for Cars upon Mining Cages. S. Galli, Mulberry, Kan. 1,150,819 Aug. 17, 1915. Filed Jan. 21, 1915. Serial No. 3555.

Boiler Construction. W. F. Sellers, assignor to Edge Moor Iron Co., Edge Moor, Del. 1,148,544 Aug. 3, 1915. Filed Nov. 25, 1914. Serial No. 873,851.

Mine Car Wheel. H. A. Holzer, assignor to United Iron Works, Springfield, Mo. 1,144,302, June 22, 1915. Filed Apr. 5, 1915. Serial No. 19,267.

Boiler Furnace. C. H. Schroder, assignor to Murray Iron Works, Burlington, Iowa. 1,141,127. Aug. 24, 1915. Filed Feb. 3, 1915. Serial No. 5920.

Smoke Prevention Apparatus for Furnaces. W. Williams, Glebe, New South Wales, Aust. 1,148,421 July 27, 1915. Filed Nov. 4, 1913. Serial No. 799,194.

Manufacture of Coal Briquettes. H. J. Phillips, assignor to Pure Coal Briquetters, Ltd., Cardiff, Wales. 1,149,536 Aug. 10, 1915. Filed Jan. 31, 1914. Serial No. 815,688.

INDUSTRIAL NEWS

Philadelphia, Penn.—Lloyd's, England, have posted as missing the steamer "Linda Fell," which left this port on Sept. 29 with a cargo of 2,720 tons of coal for Cienfuegos, Cuba.

Ottawa, Ill.—On and after Nov. 15, 1915, the offices of the St. Paul Coal Co. will be located at 1368 Fullerton Ave., Chicago. The old offices were at 306 Central Life Bldg., Ottawa, Ill.

Harlan, Ky.—The Harlan Coal Mining Co. with mines at Coxton and Kayu has constructed 25 additional miners houses and plans to add more at Coxton, in preparation for more extensive mining operations.

McAlester, Okla.—Faires Coal Mining Co. has been incorporated at Oakland City with a capital of $1,000 for the purpose of coal mining. The directors are H. C. Faries, Onie Faries and William T. Fleener.

New Straitsville, Ohio—The Wm. J. Miller Coal Co. has been incorporated with a capital of $5,000 to mine coal. The incorporators are Wm. J. Miller, Herbert Minshull, George Hite, Harry Leake and Frank Davis.

Philadelphia, Penn.—Bituminous tonnage carried by the Philadelphia & Reading Ry. during September amounted to 1,488,917 tons as compared with 1,347,439 tons last year, and 1,521,727 in August of the present year.

Knoxville, Tenn.—The Southern Ry., which recently completed the coal handling terminals at Charleston, S. C., has had a moving picture film made of the work and is showing the picture in theatres in this section.

Bellaire, Ohio—The Johnson Brothers Coal Co. has been incorporated with a capital of $25,000 to mine coal. The incorporators are J. F. Johnson, J. F. Johnson, Jr., Elizabeth Johnson, Joseph E. Poorman, Bessie Poorman.

Ironton, Ohio—The Ironton Engine Co. has begun the manufacture of a new type of electric mine locomotive, operated by a storage battery, and possessing original features of considerable value, it is understood.

Charleston, W. Va.—J. W. Dawson recently purchased at public auction the plant of the Hughes Creek Coal Co. at Hughestown for $3,000. The estimated value of this property was $25,000. It was sold by James Kay, receiver.

Pittsburgh, Penn.—Youngwood Coal and Coke Co. has been incorporated to drill for oil, gas, clay and other like mineral products. Capital, $150,000. Incorporators, C. W. Fulp, H. S. Sterling, A. W. McCoy, all of Pittsburgh, Penn.

Washington, D. C.—Anthracite coal operators of Pennsylvania have petitioned the Interstate Commerce Commission to reopen the rate case in which they asked for lower rates on coal shipped from the Wyoming region to tidewater for trans-shipment.

Beckley, W. Va.—Prince E. Lilly recently purchased from W. W. Hume, R. D. Roller and G. C. Hedrick, 100 acres of coal land near the junction of Stone Coal and Pine Creeks, about four miles from Odd. It is said that $20,000 was paid for this property.

Pittsburgh, Penn.—The 80th birthday of Andrew Carnegie and the 15th anniversary of the founding of the Carnegie Institute of Technology will be celebrated by appropriate exercises at the Institute on Nov. 23 and 24, 1915. An address will be delivered by Henry F. Pritchett.

Whitesburg, Ky.—The Funk Coal Co. organized by H. H. Funk and others is opening a coal development on the Chesapeake & Ohio's Big Sandy extension near Pikeville. This will have a daily capacity of about 1,000 tons to start with. The company will ship from Ward Siding.

Ashland, Ky.—Thomas Adams, president of the Norton Iron Works, is understood to have bought a 28-acre site on which to build a coke and coal by-product plant, to reach a cost of $200,000, to supply coke to the iron works. The plans of the concern, however, are declared to be indefinite.

Camden, N. J.—Three new steamers of about 5,500 tons gross register are about completed at the plant of the New York Shipbuilding Co., which vessels it is understood will be put into the Virginia coal trade as soon as finished. These boats are the "Jonancy," "Virginia" and "Bylayl."

Richmond, Mo.—The Hubbell-Hamilton Coal Co., of Richmond, Ray County, has been organized with a capital stock of $2,400. The incorporators are Clarence H. Hubbell, Robert L. Hamilton, and George W. Hunt. The organization is for the purpose of owning, operating and developing coal mines in Ray County.

Harlan, Ky.—The Creech Coal Co., recently organized in Bell County with $200,000 capital, will develop a mine on the headwaters of Wallins Creek in Harlan County with two openings and proseses a 40-ton daily output at the outset. Work has already been started and a number of miner's houses have been built.

Knoxville, Tenn.—An informal meeting of the Southern Appalachian Coal Operators' Association was held in this city on Saturday, Nov. 13, at which the market situation was considered at considerable length. A good deal of consideration, it is stated, was given to the possibilities of export of coal from the Tennessee-Kentucky field via Charleston, S. C.

Praise, Ky.—D. D. Cox, of Castlewood, Va., has been elected president of the Superior Coal Co., which recently incorporated and which will develop a 300 acre boundary. The capital stock is $50,000 and the other officers are C. W. Boyd, Richlands, Va., vice-president; Frank G. Craig, secretary-treasurer and S. R. Johnson, of Praise, is constructing engineer.

Washington, D. C.—Tariffs of the Southern Ry increasing coal rates from mines at Belleville and other Illinois towns to Kansas City and points on the Chicago & Alton R.R. in Missouri were suspended recently by the Interstate Commerce Commission until Mar. 14. The present rate from Belleville to Kansas City is $1.90 per ton, and the proposed rate is $2.15.

Middlesboro, Ky.—Two and a half miles of the Wallins Creek extension of the Louisville & Nashville R.R. is completed and the contractor has the remaining three miles partly graded. Forty teams are at work and the early part of January is expected to see the branch in operation. This extension opens a large area of some of the best coal land in Harlan county.

Buffalo, N. Y.—The barge "P. D. Armour," owned and sailed by Capt. Joseph A. Boland, of this city, went on the peninsula at Erie, Penn., on the night of Nov. 12 with a cargo of 2,200 tons of bituminous coal, loaded at Ashtabula, Ohio, for Welland, Ont. Both vessel and cargo will be lost. The crew of the barge and of the tug towing it were saved with difficulty, as a gale was blowing.

Bluefield, W. Va.—The Clinchfield Navigation Co. is about to put a new steamer into commission. This vessel was recently completed at a shipyard on the Great Lakes and is now on its way to the Atlantic where it will be used in the coastwise trade, chiefly between Charleston, S. C., and gulf ports. The new vessel, which has not yet been named, has a cargo capacity of about 3,000 tons.

Scranton, Penn.—As the result of complaints entered by the city of Scranton claiming the local rates of freight on anthracite coal from the mines to the cities and towns hereabouts were excessive, the Public Service Commission has ordered a reduction. In some cases the change amounts to as much as 49% and on an average amounts to 27%. The new rates are to become effective Dec. 11.

Whitesburg, Ky.—A party of Pennsylvania and other Eastern capitalists is making a tour of the Shelby Creek-Long Fork and Beefhide sections of the Letcher-Pike border east of here with the purpose of leasing for development a large boundary of coal lands lying along the new line of the Baltimore & Ohio R.R. It is stated that things will be in readiness to start the development work by the first of the new year.

Baltimore, Md.—For years the anthracite tonnage of the Baltimore & Ohio R.R. to this city has been growing less and less owing to poor coal yard facilities on the company's tracks here. To overcome this difficulty the company recently erected several large and up-to-date coal pockets on Huntingdon Avenue, which have now been occupied by dealers. It is the intention of the Baltimore & Ohio to erect additional retail yards on its tracks and lease them to dealers.

Whitesburg, Ky.—It is stated here that preparations are being made by the Chesapeake & Ohio R.R. Co. to build a 15-mi. branch up the right fork of Beaver Creek, on the Knott-Floyd county line. The rights-of-way for construction of the branch were obtained some time ago it is said. A number of firms, including the Elkhorn Mining Corporation, hold mineral rights in that section and are said to plan large operations. This is one of the richest undeveloped fields in Eastern Kentucky.

Pottsville, Penn.—According to information given out by President W. J. Richards, of the Philadelphia & Reading Coal and Iron Co., that firm is already prepared to refund to its customers the state tax collected by the company under the act of 1913. This, it is stated, will be done immediately upon being assured by the legal department that the state will make no further effort to collect the tax. In the event of this failing the money will then be turned back to the purchasers of the coal.

Birmingham, Ala.—The Tennessee Coal, Iron and Railroad Co. is preparing to open two new mines on the Woodstock coal bed near Blocton, Ala., about 40 miles south of Birmingham. These mines will replace those in the Thompson seam on the same division, which are being rapidly exhausted, and are now decreasing in output. Some of the equipment at the present mine will be reused at the new operation, mining machines being added, none being at present in use in the old mines on this division.

Monongahela, Penn.—The best coal shipments for any one month since October, 1913, were reported for October of the current year by Lockmaster George W. Paxton at Lock No. 4. The shipments during October of this year totaled 19,819,000 bu. In October, 1913, 19,933,000 bu. were locked through. All shipments at Lock No. 4 are now being made through the newly-built lock, while the rebuilding of the inner lock is in progress. The government forces engaged on this construction are sadly in need of additional workmen.

Great Falls, Mont.—Pearce Coal Co. has been incorporated here with a capital of $50,000. The articles of incorporation state that the object of the company is to purchase, lease, or otherwise acquire coal lands, and open and operate mines, as well as to engage in the kindred activities that accompany such labors. The headquarters of the company will be at Sand Coulee, Mont. Of the stock, $27,500 has been subscribed by John N. Pearce, of Sand Coulee, Charles Lochray, of Great Falls and Dominic Spogen, of Belt, who incorporated the company.

Blackfield, Penn.—A number of improvements are to be made by the Sonman Coal Co. The output of the plant will be almost doubled by the change. An inclined plane will be used in disposing of the rock taken from the shaft and this will enable the company to greatly increase its capacity for mining coal. A new office building is also being erected.

Black Brothers Coal Company operating here is soon to open another mine and to make improvements at its new plant. This will bring about the hiring of about 100 more miners.

State College, Penn.—In the presence of Governor Brumbaugh, the new mining engineering building of Pennsylvania State College was recently dedicated. The address of dedication was delivered by H. M. Chance, of Philadelphia. The building is three stories in height and contains a valuable collection of working mine models on the third floor, with larger exhibits on the first floor. The remainder of the space is devoted to class-rooms. On the day of dedication the students gave an exhibition of mine rescue work. The entire cost of the building was $50,000.

Coal Trade Reviews

General Review

Anthracite trade satisfactory but less active than anticipated. Reactionary tendency in bituminous though prices are steady. Decline in exports continues. Uncertainties in the Lake markets. Colder weather stimulates buying in the Middle West.

Anthracite—The hard-coal trade is backing and filling pending the arrival of lower temperatures. The situation is generally satisfactory, but there is no pressure for shipments such as is to be anticipated at this period. A few sizes are in short supply, but occasional concessions are noted on other grades where forced sales are made. The general tendency among retailers to file orders well in advance has done much to relieve a reactionary tendency in the market. Possibility of labor troubles in the early spring is also tending to shake out numerous protective orders. Collections are excellent, dealers becoming anxious about their credit position with the large companies whom they will look to for protection in the event of any serious scarcity after Apr. 1. Lake shipments are on a larger scale despite increased freight rates, the arrivals for the season to date at the upper Lake ports being 75,000 tons ahead of last year.

Bituminous—Uncertainties have developed in the market which have caused a moderate reaction, and prices are a trifle weaker. There have been no important revisions, however, and it is not thought by any means that the top of the market has yet been reached. Some agencies tied up with low-priced contracts have been forced into the open market to meet their obligations because of the slow movement. Liberal shipments on contracts continue, consumers evidently endeavoring to keep full stocks as long as possible. The car supply situation continues more alarming each week. It is obvious that the heavy movement of all kinds of traffic is creating a pronounced congestion, which shows every indication of becoming more serious as the season advances.

Exports—The only favorable aspect of the off-shore business is the bunkering trade, which continues fairly heavy. The constantly increasing ocean freights have brought the foreign business practically to a standstill. Some attractive inquiries are still being received, though these are perhaps less numerous as it is becoming clear that the more advantageous terms obtainable in Great Britain, both as regards initial cost and transportation, are beginning to tell. The higher ocean freights are spreading to the coastwise trade where some premiums have been noted during the past week.

Lake Market—While the approaching end of the shipping season is always the cause of apprehension, there are other constructive factors in the market that make the situation rather mixed. Cars are growing steadily scarcer, labor is none too plentiful and there is a strong possibility of a sharp rush for surplus coal at any time to provide for a possible suspension in April. Bituminous shipments to the upper Lake ports for the season to the first of the current month are one and three-quarter million tons behind last year, although this is due primarily to the heavy stocks carried over from the previous season. A lull has developed in the domestic trade, but there has been a still further expansion in the manufacturing which has had a tendency to stiffen up prices on steam coal.

Middle West—The recent lower temperature has had a beneficial effect on the market which was beginning to show some soft spots, and accumulations have been substantially reduced. Operators are holding rigidly to their policy of curtailing productions rather than attempt to force the market, and in view of the existing car and labor shortages, together with the comparatively small stocks on hand, the technical position of the market is strong. The mild weather has tended to curtail the movement out from the upper Lake ports. As a rule industrial operations throughout the Middle West are close to full capacity and it is seldom that much difficulty is experienced in finding prompt disposition of any shipments.

A Year Ago—Anthracite shippers are aggressively canvassing for orders but the recent cold snap has steadied up the market. Tidewater bituminous stocks continue at a maximum, and substantial concessions are obtainable.

BUSINESS OPINIONS

The Iron Age—With new orders steadily running far in excess of current output, it was not surprising that the United States Steel Corporation withdrew quotations in foreign markets last week. This action does not in itself mean a long withdrawal from the export trade, for similar steps are taken at intervals in the domestic market. The fact is that the steel companies have the greater part of their output sold for four or five months, some for most of the first half of 1916, and that in certain lines the market on forward deliveries has been sold to a standstill. Conservative men in the trade who thought two months ago to hold demand in check by asking sharp advances have given up effort on that line. The past week has shown unmistakable signs of a steel market that has cut loose. Pig iron, with somewhat less reason, is following the course of steel.

Boston News Bureau—The continued betterment in fundamental conditions begins to impress itself upon people generally. Every day sees some industry that has been a laggard wheel into the procession. This is a stimulus that makes for confidence and incites broader operations. There is a rising market in all products—in steel, in copper, in lead, in zinc and even in oil. Railroads are moving more traffic and both gross and net earnings are increasing appreciably. Notwithstanding all this, money is still redundant. We are beginning to see the value of the federal reserve system. The power to expand is very real.

Dun—In spite of the rapidity of the movement, there is no slackening of the advance that foreshadows the greatest commercial development in the history of the country. Following many months of gradual recovery and adjustment to new conditions, progress has come with such a rush that reaction is feared in some quarters; yet the economic position steadily gains in strength and seldom, if ever, has the situation so favored continued expansion.

Building Statistics—Permits granted last month, according to returns received by "Dun's Review," from the Building Departments of 86 of the leading cities in the United States, call for the expenditure of $59,622,149, an increase of 23.7%, as compared with the $48,058,062 reported for the corresponding period a year ago.

Dry Goods Economist—The recovery in the cotton market, bringing the New York price for spot cotton to 11.75c., was hardly needed to add strength to the price of finished cotton fabrics. In these goods labor and the cost of finishing are important factors. To sellers of gray goods, however, the advance is welcome.

Bradstreet—Mild weather and delay in crop marketing tend to retard retail buying of heavy seasonable goods as distinguished from edibles, but over against this is to be noted increased demands on jobbers, wholesale dealers and manufacturers, which point to a veritable trade ground swell, such as was witnessed in years like 1912, just before the Balkan war began, and in the flush times of 1906. The fact seems to be that in general trade, as in iron and steel and kindred lines, domestic demand had lagged behind and stocks in final distributers' hands were depleted, causing recent eager buying, which has resulted in a mass of orders.

Southern Lumberman—Price advances in the yellow pine market during the past week have been so rapid and so repeatedly made that the problem of ascertaining prevailing prices is rendered unusually difficult. Speculation is now a factor in buying, and despite increased production there is no sign of weakening anywhere along the line. In fact, advances ranging from fifty cents to a dollar have occurred practically throughout the list, and as increases are being announced almost daily by many of the mills, still higher values may be expected during the coming week.

Marshall Field & Co.—Current wholesale distribution of dry goods has been in excess of the corresponding period of a year ago. Road sales for both immediate and future shipment have been in much larger volume, and more customers have been in the market. Collections are normal.

ATLANTIC SEABOARD

BOSTON

Pocahontas and New River easy with prices unchanged. Low on-car prices for 1916 extend to points accessible to lighter. Georges Creek shippers conservative on futures. Pennsylvania grades less active. Water freights continue to advance. Anthracite trade good.

Bituminous—With a liberal movement on contract from Hampton Roads the situation of Pocahontas and New River continues fairly easy. There is ample coal on cars and very little spot inquiry, so there is practically no change in prices f.o.b. Meanwhile, consumers in this territory are trying to keep storage full in anticipation of slow movement later. The high winds along the coast have interfered materially with the movement of tows and several of the shippers are behind on deliveries. If there develops a widespread shortage of cars for all-rail shipments it is likely that an extra demand will be thrown on the Tidewater trade, but this is not looked for under a month's time, if it comes at all. Developments seem to be slow so far as concerns firmer prices on Pocahontas and New River.

The canvass for contracts inland continues, but somewhat less actively, probably on account of the rapid advance in water freights. As low as $3.35, however, has been named on cars Mystic Wharf, Boston, for the year beginning Apr. 1, 1916, and a similar basis has lately been extended to cover deliveries to dealers and consumers' wharves that can be reached by lighter from the various terminal handling plants. A large volume of business has been closed, but for the most part in usual channels.

Georges Creek shippers are filling requisitions with reasonable despatch, but new business is being consistently declined. This is true especially of deliveries all-rail, a car shortage being somewhat in evidence in the Maryland districts.

The better grades from Pennsylvania continue in active demand, due in part to increased quotas required by consumers on contract, but chiefly to difficulties with mineworkers, particularly in the non-union districts. Some shippers are declining new business until the outlook is clearer. The car movement all-rail is easier than a week ago.

Water Freights have advanced another 10c., $1.10 having been paid on a 5,000-ton schooner, Hampton Roads to Portland. As high as $1.50 is rumored to have been paid on a small barge to Bangor, Me., but the premium in this case is due to the approach of river closing. The rate from Norfolk to Long Island sound ports is still 50 cents.

Anthracite continues in good demand, but it cannot be said there is any great pressure for shipments. In spite of the slow movement of transportation the shipping companies are able so far to keep up with their orders. There is some inclination on the part of retailers to file orders well in advance of needs which helps to discount any "pinch" within the next month or two.

Bituminous quotations, f.o.b. loading ports at points designated, are about as follows per gross ton:

	Philadelphia	New York	Baltimore	F.o.b. Mine
Clearfields	$2.25@2.75	$2.55@3.00	....	$0.95@1.50
Cambrias and Somersets	2.45@2.95	2.70@3.20	....	1.20@1.65
Georges Creek	2.92@3.02	3.22@3.32	$2.85@2.95	1.67@1.77

Pocahontas and New River prices, on cars Boston, are $3.45 @3.73. Providence, $3.45@3.63; and f.o.b. loading ports at Hampton Roads, $2.80@2.85.

NEW YORK

Anthracite situation satisfactory. Demand steady and all prepared coals tighter. Line trade heavy. Fair movement in soft coals. Good grades scarce and none to be had in open market. Mine prices stiffer.

Anthracite—The hard coal situation continues satisfactory. There is a steady demand which keeps everybody busy and there has been a slight delay in loading some grades unless a mixed cargo is taken. Wholesale houses are paying more attention to the approaching end of the labor agreement than a few weeks ago and there is more hesitancy in the closing of contracts for the delivery of steam coals after the new year. The lack of cars is becoming more serious with the approach of winter.

Egg coal is not as plentiful, but occasional lots are picked up at 10 cents below the circular. Stove is the shortest of the domestic grades and is going at full price, while chestnut is in the same class as egg. The line trade complains of its inability to secure all the chestnut coal desired but much of this delay is due to the scarcity of the kind of cars desired.

Steam coals are coming into their own. Pea is in fair demand and is commanding nearly full price in all instances. High grades of buckwheat No. 1 have been quoted at $2.70 f.o.b. lower port, but this was the exception. The cheaper grades are quoted at around $2.40. Buckwheat No. 2 is short in all grades and there are reports of 10c. premiums for quick deliveries.

Quotations per gross ton, f.o.b. Tidewater, are as follows:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$5.05		$5.10	
Egg	5.30	$5.20@5.30	5.35	$5.25@5.35
Stove	5.30	5.25@5.30	5.35	5.30@5.35
Chestnut	5.55	5.40@5.55	5.60	5.50@5.60
Pea	3.50	3.25@3.50	3.55	3.50@3.55
Buckwheat	2.75	2.25@2.75	2.80	2.25@2.80
Rice	2.25	1.85@2.25	2.30	2.00@2.30
Barley	1.75	1.50@1.75	1.80	1.75@1.80

Bituminous—There is a good movement, but there has been a slight easing up. The supply at Tidewater is not large, considerable coal being rushed to the Lakes and Western points. While much coal is on its way here, good grades are scarce and fair coals are easily disposed of at good prices.

Car supply shows no improvement, while the freight congestion on nearly all roads centering here is tying up much of the available rolling stock. Some mines are reported as receiving from 50 to 60% of their usual quota of cars. Many large steam users are inquiring for more coal than their contracts call for and are picking up the choicest of the cheaper grades. Mine prices are stronger, some of the poorer coals being quoted at $1.25.

Increasing freight rates are interfering with the export situation. The trade heard last week of a foreign gas corporation in the market for 20,000 tons of coal, but refused to pay the freight rate demanded. Inquiries are also being received from Brazil. Bunkering remains heavy.

Current quotations on various grades per gross ton, f.o.b. Tidewater, are about as follows:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.20@3.30	$3.20@3.30	$3.20@3.30	$1.75@1.85
Georges Creek Tyson	2.95@3.00	2.95@3.00	2.95@3.00	1.40@1.45
Clearfield:				
Medium	2.80@2.85	2.80@2.85	....	1.25@1.35
Ordinary	2.75@2.80	2.75@2.80	....	1.20@1.25
Broad Top Mountain				1.25@1.45
Cambria County:				
South Forks	3.05@3.10	....	....	1.50@1.60
Nanty Glo	2.90@3.00	....	....	1.35@1.45
Barnesboro	2.85@2.90	....	....	1.30@1.35
Somerset County:				
Quemahoning	....	2.90@3.00	2.90@3.00	1.35@1.45
Medium	2.80@2.90	2.80@2.90	2.80@2.90	1.25@1.35
Latrobe	2.70@2.75	....	....	1.15@1.20
Greensburg	2.90@3.00	....	....	1.25@1.35
Westmoreland	3.20@3.30	....	....	1.45@1.55
West Virginia Fairmont ¾		2.70@2.80	2.70@2.80	.90@1.10
Fairmont mine-run		2.70@2.75	2.70@2.75	.90@1.00
Steam		2.70@2.80	2.70@2.80	1.15@1.25
Western Maryland		2.70@2.80	2.70@2.80	1.15@1.25

PHILADELPHIA

Anthracite checked by mild weather but prices strong. Prepared sizes in generally good demand. Buckwheat also active but ordinary grades of rice are going heavily to storage. Collections good. Bituminous orders, hard to fill because of car shortage.

Anthracite—Too much mild weather has had an adverse effect on the market and delayed the expected rush. Shippers and the dealers are chafing at the postponement, since the time lost represents coal that will never be burned. However, the market has moved along quietly and all sizes are in very fair demand, but not sufficiently to cause a scarcity. There have been a few instances of coal standing at scales without orders, that was sacrificed, but on the whole good grades are bringing the full circular.

Pea coal is being stocked, but not in the quantities expected. It is a good buy at $2 and the tax, the price at which the companies have protected the best trade until Jan. 1. Next month the demand for this grade will probably be unusual.

Broken is all sold and the demand is increasing. Egg is none too strong and just now is probably the weakest size. Stove is one of the best sellers, if not the very best. Chestnut is doing very well and much better than for some time. Buckwheat is growing stronger, with special grades in very active demand. Only certain grades of rice are selling, this size still being largely sent to storage by the companies.

Another noticeable feature of the market recently is the amount of new business coming to the larger companies from firms who have not bought for several years. This indicates that these dealers are looking to the future in case of trouble in the regions. Collections are good and there is hardly likely to be any trouble in this direction for a long time to come, as the dealers all realize their cases would be hopeless with coal scarce and their accounts in bad shape.

Prices per gross ton at the mines and for tide shipments f.o.b. Port Richmond are as follows:

	Line	Tide		Line	Tide
Broken	$3.50	$4.75	Pea	$2.50	$3.25
Egg	3.75	5.00	Buckwheat	1.50	2.25
Stove	4.00	5.00	Rice	.85	1.75
Chestnut	4.15	5.25	Barley	.50	1.50

Bituminous—At this writing it is very much a broker's market; that is, on account of many shippers being tied up on low-price contracts and their inability to get full shipments from their operations, they are compelled to buy in the open market to meet their obligations. In several instances purchases of coal were made on this account at 40c. above the contract price. Under such conditions mine owners are not willing to consider any new contract business at current prices. While there has been no particular price change in the past two weeks, it is felt that the top of the market has not been reached.

Export shipments seems to be dwindling and even the foreign inquiries, which up to this time have been very plentiful, are falling off. Large shipments are now being made from the British Isles at prices, both as to coal and freight, which now place the American market at a decided disadvantage.

The ruling prices per gross ton at the mines are well represented by the following list:

Georges Creek Big Vein	$1.70@1.80	Fairmont gas, ¾	$1.35@1.45
South Fork Miller Vein	1.55@1.65	Fairmont gas, mine-run	1.20@1.25
Clearfield (ordinary)	1.20@1.30	Fairmont gas, slack	.90@1.00
Somerset (ordinary)	1.20@1.25	Fairmont lump, ordinary	1.15@1.20
West Va. Freeport	1.05@1.15	Fairmont mine-run	1.00@1.10
		Fairmont slack	.90@1.00

BALTIMORE

Uncertainties in the trade cause a moderate reaction. Car supply becomes shorter. Exports declining heavily as a result of high freights.

The coal trade here is being squeezed every few days by lack of cars in important mining districts, and then again by scarcity of boats at Tide when fuel is rushed through on export account. These uncertainties have made the market a trifle weaker as to prices, although the best coals for the most part are out of the market. Despite the fact that coal men have offered as high as $18 on movement to the west coast of Italy, where there is a heavy demand, the export movement from this port has suffered a heavy slump. During the week ending Nov. 13 only 12,668 tons was loaded here for foreign ports.

The car supply in most of the mining districts of Maryland, West Virginia and Pennsylvania the past week has not averaged much more than 60%. Demand for coal has eased off a bit, however. Prices in gross tons to the trade are about as follows:

	Mines	Balt.*	Fairmont	Mines	Balt.*
Geo. Crk. Big Vein	$1.80	$2.98	Ordinary mine run	$0.95	$2.33
Geo. Crk. Tyson	1.50	2.68	Ordinary ¾	1.00@1.05	2.43@2.48
Clearfield	1.30	2.48	Ordinary slack	.95	2.38
South Fork	1.45	2.63	Low sulphur mine-run	1.20	2.63
Latrobe	1.10	2.18	Low sulphur ¾	1.30	2.73
Somerset (best)	1.40	2.58	Low sulphur slack	1.00	2.43
Somerset (good)	1.25	2.43			
Quemahoning	1.35	2.53			
Freeport	1.10	2.18			
Miller Vein	1.30	2.38			

* F. o. b., outside Capes.

Anthracite dealers here are busy. Colder weather has awakened the domestic consumers, and they are clamoring for coal. Supplies are pretty free, although all dealers are not able to fill gaps as made in their yards.

HAMPTON ROADS

Foreign and coastwise dumpings show some improvement. Government takes some coal by colliers and bunkers several vessels from barges.

The dumpings for the second week of November have shown some improvement over those for the first week, although this improvement has not been large. One of the most interesting shipments of the week was that to Barcelona, by the schooner "Edward J. Lawrence;" this cargo consisted of 4,967 tons and the freight rate was $10.50 per ton. In addition to coal loaded into colliers the government has also taken some by barge for bunkering several of the ships now in Hampton Roads.

The accumulation of coal on the railroad yards is still somewhat above normal, but there is a fair amount of vessel tonnage in port and with that about due this accumulation should be considerably reduced early in the coming week.

There has been practically no change in prices on the various grades of coal shipped from this port. Some few sales have been made during the week, but so far as can be ascertained the greater part of the coal moving has been applied on contract business.

Railroad Tonnages—Dumpings over the local piers for the past five weeks compare as follows:

	Week Ending				
Railroad	Oct. 16	Oct. 23	Oct. 30	Nov. 6	Nov. 13
Norfolk & Western	145,236	163,920	126,145	120,590	133,329
Chesapeake & Ohio	66,361	81,517	74,028	78,210	70,282
Virginian	54,964	51,304	78,237	46,952	72,888
Totals	266,561	296,741	278,410	245,752	276,499

Ocean Charters, Clearances and Freights

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	To	Tons	Rate
Coniston	Rosario	2,363	
P. Setzer	Mayport	1,268	1.15
E. Drake	Martinique	789	3.90
J. W. Elwell	Rosario	1,081	
Daylight	Fort-de-France	571	3.75
A. J. Trainer	Calais	336	1.35
Claveresk	Antilla	2,441	

BALTIMORE

Vessel	To	Tons	Rate
Vindeggan	Sweden	1,519	
Mimer	Mexico	699	

BALTIMORE—Continued

Vessel	To	Tons	Rate
Jean	Mayport	2,391	
Hilton	Tampa	2,324	

VIRGINIA

Vessel	To	Tons	Rate
Inverkip	Rio Janeiro	2,806[1]	9.36
Jacksonville	Bermuda	547	8.00
E. H. Blake	Bermuda	484	3.25
Calumet	Pernambuco	1,094	8.00
Sif	St. Lucia	1,959	
Siam	Buenos Aires	800	8.00

[1] 500 tons per day.

VESSEL CLEARANCES

The following steamers have cleared from various ports during the week ended Nov. 14:

NORFOLK

Vessel	Destination	Tons
Lewis[1]	Grand Bank	75
Giovanni[2]	Porto Ferrajo	4,600
Strathalbyn[2]	Dakar	6,508
Curaca[3]	Valparaiso	1,500
Kalliope[4]	Rio de Janeiro	2,588
J. Lawrence[4]	Barcelona	4,967
Parodi[5]	Maddalena	5,529
Silvia[2]	Genoa	5,590
Ulysses[6]	Canal Zone	12,015
Berwindmoor[7]	Havana	8,000
Wegadesk[8]	Canal Zone	6,500
Navrogordatos[2]	Savona	4,450
Romford[3]	Port Castries	4,500
Fructidor[6]	Italy	5,000
Trafalgar[4]	Havana	3,000
Vitalia[9]	St. Thomas	1,450
Dominic[10]	Para & Manaos	2,700

NEWPORT NEWS

Vessel	Destination	Tons
L. Neff[11]	San. de Cuba	1,100
Mashona[12]	Buenos Aires	4,000
Primo[5]	Italy	5,700
Sif[11]	St. Lucia	4,700
Coquet	Marseilles	5,500

BALTIMORE

Vessel	Destination	Tons
Santa Anna	Italy	1,972
Enrichetta	Italy	5,017
Vindeggen	Sweden	3,466
W. Bennett	Martinique	712
M. Baxter	Cuba	1,501

PHILADELPHIA

Vessel	Destination	Tons
A. J. Turner	Calais	336
G. E. Klinck	Camden	800
Harrisburg	Boston	
Powell[14]	Boston	
Skippack[13]	Brookline	
Monitor[13]	Portland	
Tabor[13]	Portland	
Belita	Vita, Cuba	
Cacoosing[13]	Scituate	
Macungie[13]	Providence	
Paxinos[13]	Quincy Point	
Conewago[13]	Bangor	
Preston[13]	Gloucester	
Rutherford[13]	Portland	
Lincoln[13]	E. Cambridge	
Ontelaun[13]	Milton	
Maple Hill[13]	Boston	
Frankric	Havana	
Ashland[13]	Boston	
Cumberland[13]	Portsmouth	
Herndon[13]	Portsmouth	
Shawmut	Mayport	
Anna	Quebec	1,800
F. & A. Allen	Calais	735
J. H. Elwell	Rosario	1,900
Suffolk[13]	E. Boston	
Brookside[13]	Brookline	
Pocopsin[13]	Milton	
Penn	Portland	
E. Garden	Salem	
W. D. Marvel	Calais	650
S. M. Seaman	Arroyo	
H. A. Alyn	Boston	
Novo	Buenos Aires	2,200
R. P. Murphy	Martinique	527

[1] Norfolk C. & I. Co. [2] Pocahontas Fuel Co. [3] Castner, Curran, & Bullitt, Inc. [4] Smokeless Fuel Co. [5] New River Coal Co. [6] W. C. Atwater & Co. [7] Baker Whiteley. [8] Crozer-Pocahontas. [9] Hasler Bros. [10] Chesapeake & Ohio Coal & Coke Co. [11] Berwind White. [12] Wyatt Coal Co. [13] Phila. & Reading Coal & Iron Co. [14] Sterling Coal Co.

OCEAN FREIGHTS

The freight market continues to advance. The last charters for coals, to Lower Plate ports, were at $10.80, 500 tons per day discharge and steamers are difficult to obtain even on these terms. Shippers of Mediterranean coal are not willing to pay rates owners ask, consequently no chartering is being effected for the movement of coal in this direction. The tonnage scarcity is making it difficult to operate on West Indian orders. We would quote freight rates on coal by steamer as follows:

To	Rate	To	Rate
Havana	$2.75@3.00	Bermuda	$3.50
Cardenas or Sagua	3.00@3.25	Vera Cruz	5.00@ 6.00
Cienfuegos	3.00@3.50	Tampico	5.00@ 6.00
Port au Spain, Trinidad	4.00@4.25	Rio	10.80
St. Lucia	3.75@4.25	Santos*	11.04@11.52
St. Thomas	3.50@3.75	Montevideo	10.80
Barbados	4.00@4.25	Buenos Aires or La Plata†	10.80
Kingston	3.25@3.75	Rosario	12.00
Curacao	3.75	West Coast of Italy	16.80@18.00
Santiago	3.50	Barcelona**	15.60@18.00
Guantanamo	3.50	Valparaiso or Callao	11.00@12.00
Demerara	6.00@6.50	Marseilles	15.60@18.00

* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British steamers; neutral steamers are more difficult to obtain and the rates are always higher.

W. W. Battie & Co.'s Coal Trade Freight Report.

LAKE MARKETS

PITTSBURGH

Market presents mixed showing, but prompt slack is higher. Operations at 75%. More car shortages.

The trade as a whole has shown little if any improvement, though there is a decidedly stronger market in slack and somewhat more domestic coal is moving. There are divergences of opinion about the future. The end of the Lake season, now near at hand, is always feared, but on the other hand there are unusual prospects for consumers desiring to stock coal against a possible suspension of mining Apr. 1, and this, with the steadily growing scarcity of cars, helps to give the market at the moment a better appearance than it otherwise would have.

The scarcity of slack in proportion to the demand is now pronounced, and the market is quotable at 10c. higher than a week ago, being now almost up to the contract level.

Labor is in only fair supply, while car shortages are daily growing more important. Not much production is being lost, in the aggregate, but the market is held steadier than would otherwise be the case. Operations in the district are at about 75% of capacity.

We quote free coal as follows, slack being higher than last week: Slack, 85@90c.; mine-run, \$1.15@1.20; ¾-in., \$1.25@1.35; 1¼-in., \$1.35@1.45, per net ton at mine, Pittsburgh district. On contract we quote: Slack, 90c@\$1; nut, \$1@1.10; mine-run, \$1.15@1.25; ¾-in., \$1.20@1.30; 1¼-in., \$1.30@1.40.

BUFFALO

Perplexing difference between this market and most others. Bituminous mines are unable to obtain specified prices. Anthracite slowing down on account of fine weather.

Bituminous—There is a good local demand, but that is about the best feature. This market is decidedly slower than most others. Pittsburgh is setting prices 15c. higher than can be obtained here, especially in Canada and eastward. There is the same difference between us and the Seaboard district from New York southward. Buffalo operators who are able to get into the Seaboard market have more orders than they can fill.

The Allegheny Valley mines cannot reach the Seaboard and they find trade very dull. Some jobbers complain that prices quoted here are too high.

Prices made by the Pittsburgh shippers, which are not always obtainable here, are as follows:

	Pittsburgh	Allegheny Valley	Penn Smokeless
Lump	\$2.80	\$2.50	\$2.55
Three-quarter	2.65	2.30	.....
Mine run	2.55	2.20	2.30
Slack	2.15	1.90	2.30

Anthracite—The weather is too warm for the best results in the local trade and the demand is not as good as it was a week ago. Consumers often get the idea that mild weather is going to prevail for some time and buying is put off. The line rail trade continues good and the Lake shippers are sending out cargoes whenever there is room for them on the Upper Lake docks, regardless of actual sales. As a rule the smaller Lake ports have laid in their supply for the winter. Lake Michigan rates are up. Vessels are refusing 50c. to leading ports and will seldom take 75c. to side ports.

The anthracite mines are running at a much higher rate than through the early fall. The growing scarcity of men has made the operators anxious to get as large a start as possible. The general anthracite circular remains at \$5.60 for grate, \$5.85 for egg and stove, \$6.10 for chestnut, \$4.30 for pea, \$3.25 for buckwheat, \$2.75 for rice and \$2.50 for barley, all quotations per long ton, f.o.b. Buffalo, with 25c. additional for delivering on board vessels. Lake shipments for the week were 100,800 tons.

COLUMBUS

Increase in demand for steam sizes. Domestic business quiet, owing to the continued warm weather. Price list well maintained. Car shortage increasing.

With car shortage increasing and a continued expansion in manufacturing, the steam trade is becoming firmer in every locality; this is the best feature of the trade by far, as the warm weather has caused a lull in the domestic business. The tone of the market remains good and prospects for the future are brighter. Coal men are of the opinion that there will be a good demand for the fall and winter season.

Prices are well maintained. Retail trade is good, although deliveries are not as rushed as formerly. Householders are still placing orders for the winter's supply. Pocahontas and splints are in good demand and frequent calls are received for Hocking.

The Lake trade continues active. Boats are now chartered with difficulty because of the demand for bottoms in other lines of trade. Congestion on the docks of the Northwest is gradually passing away.

Railroads are still stocking some tonnage, but the heaviest of the stocking movement is past. Iron and steel factories are buying in larger quantities. The market for small sizes continues strong, as there is a dearth of supply, due to curtailed production of the domestic grades. The anthracite market is growing stronger as the winter approaches. Retail prices are well maintained. There is also an increasing demand for coke in the central Ohio territory.

Prices in Ohio fields are as follows per short ton, f.o.b. mines:

	Hocking	Pomeroy	Eastern Ohio	Kanawha
Re-screened lump	\$1.60	\$1.65	.....	.....
Inch and a quarter	1.50	1.50	\$1.35	\$1.50
Three-quarter-inch	1.35	1.40	.....	1.35
Nut	1.25	1.30	.....	1.25
Mine-run	1.15	1.20	1.05	1.10
Nut, pea and slack	.65	.70	.60	.60
Coarse slack	.55	.60	.50	.50

Mines have been working at about the following percentages of full capacity:

	Week Ended					Week Ended			
District	Oct. 23	Oct. 30	Nov. 6	Nov. 13	District	Oct. 23	Oct. 30	Nov. 6	Nov. 13
Hocking	60	65	60	65	Cambridge	60	65	70	50
Jackson	60	50	45	70	Massillon	45	70	70	40
Pomeroy	65	90	85	70	Eastern O.	85	80	80	85
Crooksville	85	65	65	75		—	—	—	—
					Average	65	69	67	67

CLEVELAND

Steam prices firmer and supplies short. A rushing retail trade marked the opening of the week.

Retail dealers had a rush of orders Monday morning that kept every wagon busy. The dealers are also experiencing some difficulty in getting coal from the operators. The rush is confined almost entirely to Ohio coals.

The receipts of steam coal were light over Sunday, something less than 300 cars having come in. The prices were decidedly firmer and by the end of the week there will be a decided shortage due to the inadequate car supply. As this market is as fickle as the weather a few extra cars would result in a weak market. Fine coal sold up five cents over the preceding week. Good slack brought \$1.75 on track here to jobbers and \$1.80 to the consumers.

The Lake trade is satisfactory. The shipments to the Lake will practically end this week and except to the smaller Lake Michigan ports, few cargoes at a premium are expected. There will be no rush to put extra stocks afloat this year because upper Lake docks are overstocked as it is.

Jobbers are paying the following prices f.o.b. Cleveland per short ton:

	Pocahontas	Youghiogheny	Fairmont	Bergholz	Ohio No. 8
Freight rate	\$1.45	\$1.00	\$1.15	\$0.70	\$0.90
Lump	3.60				
Lump, 6-in				2.30	
Lump, 1¼-in		2.40		2.10	2.15
Lump, ¾-in		2.30	2.15	2.00	1.95
Egg	3.60				
Egg, 6-in				1.90	
Mine run	2.75	2.15	2.05	1.90	1.85
Slack		1.90	2.00@2.05	1.75	1.75

TOLEDO

Lake movement of coal and ore heavy. Car shortage interferes materially with shipping. Steam demand strong.

The domestic market is showing some weakness, due largely to the pleasant weather conditions. The steam trade is much stronger; the demand is better and prices are stiffer. The car congestion is becoming more noticeable and the grain men have taken the matter before the state commerce commission. There is some heavy shipping both in coal and ore as the season advances. No announcement concerning the close of navigation has been made as yet.

DETROIT

Sales of steam coal diminish. Domestic trade continues in small volume. Anthracite buying lacks activity. Lake shipments near end.

Bituminous—Consumers of steam coal appear to have lost some of the interest which marked their buying a few days ago. The easing off tendency developed after two or three days of increased activity which had aroused expectations of a further improvement. Domestic coal continues sluggish due to mild weather. But despite the less encouraging situation, prices hold closely around mine quotations, even on most of the consignment stock. On some sales of the latter a reduction of 15 to 25c. a ton has been reported on large sizes to avoid demurrage accruing. The quantity of consignment coal on hand is not large. Car shortage reports continue to come from Ohio and Pennsylvania districts.

Anthracite—Little business is now being done in anthracite. Buyers seem to be holding off and orders to shippers are irregular and for small amounts.

Lake Trade—Vessels are difficult to obtain, because of continued activity in other lines. Higher freight rates to Lake Michigan ports in 1916 are expected as a result of ore shippers having made extensive contracts at an advance of 10c. a ton over the rates of this season. By taking a large proportion of the freighters to the Lake Superior route next year, the increased ore rates are likely to cause coal shippers on Lake Michigan to bid higher than the 30c. rate now in effect to the chief unloading ports.

CINCINNATI

Colder weather has so far not affected the market. Car situation has maintained prices.

The coldest weather of the fall was experienced in this vicinity last week, but the domestic demand has not responded, dealers evidently having sufficient coal on hand. The activity in the coking industry has absorbed all available slack, production being at a low level on account of the shortage of cars which has grown worse, rather than better, and when demand reaches normal it is difficult to see how the situation can be handled. In view of these conditions prices are strong and firm, with every indication of further improvement.

LOUISVILLE

Steam sizes improving but considerable domestic grades are on demurrage due to mild weather.

Steam sizes have been moving rapidly and where a week or ten days ago there was no sale for them, they now are in brisk demand. Many of the operators have quantities of domestic coals at shipping centers where it is waiting on demurrage; one day of sharp weather created a flurry in this class of coal but warmer temperatures again eased up the demand.

Sales during the week, long-ton basis, f.o.b. mines, have ranged around $1.75 to $2.10 for eastern Kentucky block, while western Kentucky lump has brought something over $1.25 with slack at 25c. and better.

BIRMINGHAM

Market substantially better, particularly on domestic grades.

Business on both steam and domestic lump coal continues to improve, especially lump, as dealers are beginning to lay in larger stocks. The car supply outlook is a potent factor, as it is feared that there will be a serious shortage by the first of the year. While the improvement on steam coal is not so marked, still conditions are better than they were thirty days ago, and showing a steady improvement as winter approaches. New mines are being opened, and others are running practically full time.

COKE

CONNELLSVILLE

Prompt furnace coke much easier and foundry softens a trifle also. Some contracts for next year. Production and shipments slightly decreased.

So far as the relation between demand and supply is concerned the bottom has fallen out of the prompt furnace coke market. There is very little demand and there are supplies in excess of the demand, but holders are not thus far under any necessity of selling, it being only very recently that they could have disposed of prompt coke to very good advantage. There would be no difficulty in buying spot furnace coke at $2.25, against $2.40 to $2.50 quoted a week ago. The softness in spot furnace coke has been reflected in only small degree in the spot foundry coke market, which is only a shade easier.

The Youngstown Sheet and Tube Co. has renewed its contracts for furnace coke with the two interests now serving its four stacks, but the new contracts run only for the first three months of 1916, or up to the time when the company's new byproduct coke plant at Youngstown is expected to be in operation. The contracts involve about 70,000 tons a month and the price is reported to be close to $2.50, as the delivery is for the period of 1916 for which the highest prices are expected. A contract could be made over the whole year at much less. Corrigan, McKinney & Co. are understood to have contracted for about half their requirements for 1916, with the interest that now has the entire tonnage. We quote: Prompt furnace, $2.25; contract furnace, first half, $2.35@2.50; year, $2.25@2.35; prompt foundry, $2.90@3.15; contract foundry, $2.90@3.15, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Nov. 6 at 424,162 tons, a decrease of 8,357 tons, and shipments at 426,093 tons, a decrease of 15,818 tons.

Buffalo—The demand is good and if the seller has genuine Connellsville foundry product on hand he can obtain the full circular price for it, which runs as high as $5 for best 72-hr. foundry, with gradations for lower quality down to $4.35 for stock coke. At the same time there is coke on the market that sells for considerably less than these figures. There are predictions that the prices will advance still further, as the supply of men is very short and does not promise to improve right away.

Chicago—The foundry-coke market retains its strength, and has been steady all week at $5.50; an increased tonnage of Connellsville has been sold at the same price. Byproduct sizes have softened slightly owing to unseasonable weather. The demand for gashouse coke has been steady. Prices per net ton f.o.b. cars Chicago are as follows: Byproduct foundry, $5@5.50; byproduct domestic, $4.75@5; Connellsville, $5.50; Wise County, $5@5.25; gas coke, $4@4.25.

Birmingham—With the large number of furnaces already in blast, and others being repaired and going into blast, the coke market is strong with the demand equal to the output. Several large contracts for shipments over the next twelve months have recently been made to one of the large iron producers, and another company will put into blast immediately a battery of ovens which has not been operated for several years. Shipments of foundry coke are improving. Prices on both grades are satisfactory.

MIDDLE WESTERN

GENERAL REVIEW

Colder weather gives impetus to domestic trade. Fine coals stronger and upward trend on steam grades. Smokeless market softer.

Temperatures became much lower during the close of last week and this had a beneficial effect, accumulated stocks of domestic sizes beginning to melt away immediately. Colder weather has brought about a renewal of buying, and with both labor and car shortages, together with comparatively small stocks in the hands of dealers, it is felt that the reaction of the past few weeks will not be repeated during the balance of the season. Prices are generally well maintained, although in spots concessions have been made to move coarse sizes accumulated at the mines. Lack of car supply has been a potent factor in restricting shipments of consignment coal during the recent warm weather, the railroads in some cases not furnishing empties where unbilled coal on hand amounted more than 50% of the daily output.

Railroad requirements have been generally increased due to heavier traffic. The volume of steam coals moving is now in excess of last year's tonnage to date. The general attitude of the Western producers has been to curtail operating time rather than to force the markets. Screenings have gained strength from the curtailment of domestic production, and contract demands leave no surplus fine coal. Industrial centers are in full blast, and unloading of coal shipments is prompt with little disposition shown to delay equipment.

CHICAGO

Operations curtailed to meet a slowing up in the demand. Considerable slack going into storage. Arrivals of Eastern coal light.

Franklin County operators have been restricting production; it is said they now have 150,000 tons of slack stored on the ground. Southern Illinois screenings are being sold at 50c. in Chicago and 60c. at interior points. A number of Williamson County mines have closed down, preferring to be idle rather than to force the higher grade coals on the market.

All grades in the Springfield district are in slight demand, and some mines have been compelled to suspend operations for a few days. A little domestic coal has been moving as low as $1.50, but strict adherence to the $1.75 price is observed by most operators. Screenings are steady.

Indiana operators are more optimistic on the outlook, as manufacturing plants of the state have obtained a large volume of war orders. No. 4 domestic demand has softened, and orders for Nos. 5 and 6 grades are heavier.

This market has called for relatively little smokeless coal during the past ten days. Apparently the car supply at the smokeless mines has improved and more spot shipments are reaching Chicago, which has softened prices. Lump is weaker, but egg is in better demand, and nut is active. Pennsylvania smokeless is still strong owing to lack of cars. All-rail splint is reaching too high prices to be an attractive buy.

Hocking domestic trade has been quiet, but with colder weather prices are likely to be higher. Stocks are only fair, and buying will soon be necessary.

An easing in the demand for anthracite has occurred and prices have weakened due to the unsold coal on track, although the circular is being strictly observed in the outlying Western territory. Many complaints are made that all-rail orders are slow in being filled and the movement is slow. Stocking by Western dealers is still behind other years.

Quotations in the Chicago market are as follows:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump	$1.65@1.75	$1.60@1.75	$1.50@1.60	$1.50@1.60	$1.50@1.60
Steam lump	....	1.25@1.35	1.25@1.35	1.15@1.25	....
2½ and 3-in. lump	....	....	1.35@1.50	....	1.35@1.40
1¼-in. lump	....	....	1.25@1.35	....	1.25
Egg	1.50@1.75	1.50@1.60	1.15@1.30	1.20@1.30	1.40@1.50
Nut	....	1.65@1.70	1.10@1.15	1.25@1.35	1.20@1.30
No. 1 washed	1.60@1.75	....	1.50@1.60	....	....
No. 2 washed	1.40@1.50	....	1.45	....	....
No. 1 nut	1.60@1.75	....	....	....	....
No. 2 nut	1.50@1.60	....	....	....	....
Mine-run	1.10@1.15	1.05@1.10	.90@1.00	.90@1.10	1.00@1.05
Screenings	.50@.60	.40@.50	.50@.60	.55@.65	.65@.75

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.60@1.75	$1.60@2.25	$1.90@2.25	$2.00@2.25	$1.50@1.75
1¼-in. lump	1.30@1.40	....	....	....	1.50
Egg	1.60@1.75	1.45@1.85	2.00@2.25	2.00@2.25	1.10@1.25
Nut	....	1.25@1.55	1.60@1.75	1.40@1.60	....
No. 1 nut	1.65@1.75	....	....	....	....
No. 2 nut	1.40@1.50	....	....	....	....
Mine-run	1.10@1.15	1.15@1.25	1.25@1.40	1.25@1.40	1.15@1.25
Screenings	.50@.60	.60@.75	....	....	.55@.75

INDIANAPOLIS

Mild weather continues, curtailing the demand for domestic grades of coal and restricting production. Screenings stiffening. Some mines closed for lack of cars.

Fair weather is still against the movement of domestic grades and this has cut down the production of screenings, with the result that there has been a stiffening of prices on the latter. There are few if any sales under 60c. f.o.b. mines. Operators are experiencing the first real car trouble and some mines are shut down. The railroads report a shortage, even in box cars.

The industrial demand for coal has made no special improvement recently, but continues much better than in the spring or summer. Sentiment is growing more optimistic. Railroad buying has increased considerably the last month. Mines have been going into operation week by week in all parts of the Indiana field.

ST. LOUIS

Domestic demand stimulated slightly by cooler weather. Prices fairly steady.

Slightly colder weather has quickened the demand somewhat for domestic grades, but a much greater drop in temperature is needed before there will be any substantial improvement. Reduced operation has forced the price of Staunton and Standard screenings still higher. Prices of the lump grades have been kept fairly steady by a considerable effort. There has been sporadic selling at prices below the quotations, but in the main the prices have held. The prices of nut, pea and slack continue better than at this time last year.

Quotations f.o.b. mines during the past week have ranged on the following basis per short ton:

	Frnk. Co.	Wlmson. Co.	Staunton	Standard
6-in. lump	$1.50@1.75	$1.50@1.75	$1.25@1.35	$1.25
8-in. lump	....	....	....	1.25
2-in. lump	....	....	1.15@1.20	1.00@1.10
3x6 egg	1.40@1.75	1.40@1.65	....	1.00
2x6 egg	....	....	....	.80@.85
No. 1 nut	1.50@1.75	1.50@1.75	....	.80
No. 2 nut	1.40@1.50	1.40@1.50	....	.60
No. 1 washed	....	1.65	1.50	....
No. 2 washed	....	1.25	1.10@1.25	....
No. 3 washed	....	1.25	1.10@1.25	....
No. 4 washed	....	1.20	1.05	....
No. 5 washed	....	.60@.70	.50@.60	....
Screenings	.60@.65	.60@.65	.30@.35	.30@.35

Freight rates—Inner group, St. Louis 57½c.; East St. Louis 37½c. Outer group, St. Louis 72½c., East St. Louis 52½c.

DULUTH

Coal receipts continue light. No great activity in shipping. Anthracite firm.

Figures given out during the week show a decrease in receipts of bituminous coal for the month of October over the corresponding month of last year, of 209,134 tons and a decrease in the total receipts for the season to Nov. 1 of 1,735,687 tons. This large falling off is due to the fact that all the shipping companies carried over heavy stocks from the previous year, the amount in storage at the present time being well up to that of former years, so that no shortage is anticipated. Nearly all the dock companies report shipments of bituminous a little below the average. The lack of inquiry is attributed to the large amount of work that had to be done on the farms this fall, and to the mild and pleasant weather, that has prevailed for the past six weeks. No change in quotations has been announced, but prices remain firm. Quotations for immediate delivery, f.o.b. cars, per short ton, are as follows:

	Yough	Splint	Hock	Smokeless	Elkhorn
Lump	$3.40	$3.40	$3.40	$4.75	$3.75
Dock run	3.10	3.10	3.05	3.25	3.25
Stove or nut	3.40	3.40	3.40	4.75	3.65
Screenings	2.40	2.40	2.25	2.75	2.40

Figures compiled during the past week show an increase in the receipts of anthracite for the month of October over the same month last year of 26,493 tons and a total increase for the season to Nov. 1 of 74,920 tons. The demand has been fairly well maintained in spite of the very mild weather and with a little touch of winter, a brisk inquiry is bound to arise. Quotations are as follows: Egg and stove, $6.85; nut, $7.10; pea, $5.55 and buckwheat, $4, all f.o.b. cars, per short ton, at Duluth.

PRODUCTION AND TRANSPORTATION STATISTICS

EXPORTS

Exports of domestic coal and coke from the United States, and bunker coal laden on vessels engaged in the foreign trade at the specified districts, during the month of September, 1915, were as follows:

	Anthracite	Bituminous	Coke
Maine and New Hampshire	971	22	......
Maryland	......	200,926	208
Massachusetts	252	2	......
New York	20,273	2,008	2,922
Philadelphia	11,552	64,351	97
Porto Rico	......	60	......
Virginia	......	603,558	......
Mobile	20	502	......
New Orleans	59	909	3
Arizona	......	2,608	7,090
El Paso	......	10,974	2,113
Laredo	......	2,775	......
San Francisco	......	36	20
Washington	......	521	3,345
Buffalo	119,440	174,251	34,316
Dakota	700	2,311	139
Duluth & Superior	6,160	1,627	182
Michigan	24	40,367	6,407
Ohio	36	646,287	379
Rochester	50,713	60,062	543
St. Lawrence	78,800	18,660	1,616
Vermont	790	460	15
Total	289,790	1,832,977	59,395

BUNKER COAL

Districts	Gross Tons	Districts	Gross Tons
Maryland	48,456	Philadelphia	29,648
New York	284,634	Virginia	162,190

LAKE SHIPMENTS

Shipments of anthracite through Sault Ste. Marie Canal for October amounted to 260,188 tons and bituminous shipments were 1,643,283 tons.

FOREIGN MARKETS

GREAT BRITAIN

Nov. 5.—Conditions in the market for steam coals remain quiet. With stocks excessive, it is possible to secure supplies of large and small coals on very cheap terms for immediate shipment, although sellers are not prepared to take such figures for more backward delivery. Quotations are approximately as follows:

Best Welsh steam	Nominal	Best Monmouthshires	$4.32
Best seconds	Nominal	Seconds	4.20
Seconds	$4.32	Best Cardiff smalls	2.52
Best dry coals	5.64	Cargo smalls	1.68

The prices for Cardiff coals are f.o.b. Cardiff, Newport or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—Chartering is very quiet. Tonnage is still scarce and rates strong. Rates are approximately as follows:

Gibraltar	$6.72	Naples	$10.80	St. Vincent	$7.20
Marseilles	10.61	Alexandria	11.76	River Plate	9.00
Algiers	7.76	Port Said	11.76		
Genoa	10.80	Las Palmas	6.60		

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

For the official advertisements of bids wanted see the Contracts-to-Be-Let Section on page 16.

+Indicates contracts regarding which official information has been received.

Recast

In the following table we give a list of all old contracts coming up for consideration during the ensuing week. The table gives our contract number, the name of the purchaser, city, tonnage and page on which the detail notice appeared:

No.	Purchaser	City	State	Tonnage	Page
1594	County Government	Arvilla	N. D.	100b	736
1611	County Government	Williston	N. D.		786
1628	Newark City Hall	Newark	N. J.	1,000a	828
1633	Central Purchasing Com.	New York	N. Y.	10,000a	829

a Indicates anthracite coal. b Indicates bituminous.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

+1193—Turtle Creek, Penn.—Bids on this contract (p. 244), which provides for furnishing the township school board with coal were as follows, per bushel: James Queen, lump, 7½c., slack, 4½c.; Jas. J. Young, lump, 8c., slack, 5c.; Geo. L. Shauer, lump, 8c., slack, 5c. Address Secy. Wm. E. Taylor, Patter Township School Dist., Turtle Creek, Penn.

+1463—Little Falls, Minn.—W. H. Ryan and Julius Jetka were the only bidders on this contract (p. 530), both of their bids being $5 per ton delivered at the City Hall. Address City Clk. Victor Schallern, Little Falls, Minn.

1617—Brooklyn, N. Y.—Bids on this contract (p. 786) for furnishing and delivering 3,300,000 lb. of egg coal to various public buildings, courts and baths, were per 1,000 lb.: Bacon Coal Co., $2.96; Thomas W. Woods Sons, Inc., $2.95½; John F. Schmadeke, Inc., $2.85. Deliveries are to be made by Dec. 31, 1915. Address Pres. L. H. Pounds, Borough of Brooklyn, Borough Hall, Brooklyn, N. Y.

1619—Pleasantville, N. J.—Bids have been received on this contract (p. 787), which provides for furnishing the Atlantic County Board of Freeholders with approximately 200 tons of Lehigh Valley pea and 150 tons of stove as follows: Geo. W. Bailey Co., pea, $4.25, stove, $6.38; Williams Darnell & Co., pea, $4.25, stove, $6.40; W. W. Clark, pea, $4.40, stove, $6.50. Address Supt. T. L. McConnell, Pleasantville, N. J.

1626—New York, N. Y.—Bids on this contract (p. 828), calling for the furnishing and delivery of 3,000 gross tons of buckwheat No. 1 for the Bellevue and Allied Hospitals were as follows: Gavin Rowe, $2.93 and Pattison & Bowns, $3.07, per gross ton. Address Board of Trustees, Bellevue and Allied Hospitals, 400 East 29th St., New York, N. Y.

1630—Buffalo, N. Y.—G. Alias & Bros., Inc., report under date of Nov. 15 that no deal has yet been concluded on this contract (p. 828), involving approximately 1,000 tons. Address Pur. Agt. I. Gillespie, G. Alias & Bros., Inc., 965 Elk St., Buffalo, N. Y.

New Business

1634—Granite City, Ill.—The American Steel Foundries Co. of this place are in the market for a contract covering their fuel requirements until Apr. 1, 1917. They require approximately 2,000 tons per month of 1¼-in. screenings and 700 tons of Nos. 3 and 4 washed. Quotations should be submitted f.o.b. their plant on the Terminal R.R. at Granite City. Address Pur. Agt. T. E. Moritz, Chicago, Ill.

+1635—Denver, Colo.—The Custodian of the United States Post Office at this place received bids untl 2 p.m., Nov. 19, for furnishing its annual fuel requirements during the ensuing year. The contract involves about 600 tons of a good grade of bituminous coal. Address Custodian B. F. Stapleton, United States Post Office, Denver, Colo.

1636—Chester, Penn.—The Keystone Fibre Co. at this place usually send out inquiries for their annual requirements of best Somerset County coal about Dec. 1, and the contract is concluded Apr. 1. Deliveries are made by Baltimore& Ohio R.R. Address Pur. Agt. Marcy, Keystone Fibre Co., Chester, Penn.

+1637—Philadelphia, Penn.—The Philadelphia County Prison received bids until noon, Nov. 19, for supplying approximately 2,000 tons of buckwheat anthracite coal, to the Reed street and Holmesburg prisons. Bids will be considered only on Lorberry, Lykens Valley, Wyoming or Susquehanna coal. Tenders are also requested on 100 tons of white ash stove coal. For bids and awards on previous contracts of the Philadelphia County Prison see pp. 448, 578. Address, Supt. Fred. A. Cooke, Philadelphia County Prison, 10th and Reed St., Philadelphia, Penn.

1638—Camden, N. J.—The Farr & Bailey Mfg. Co. at this place usually send out inquiries concerning their annual fuel requirements involving approximately 20,000 tons of coal on Nov. 1. Deliveries are made by Pennsylvania R.R. and the contract is let on Apr. 1. Address Pur. Agt. Harwell, Farr & Bailey Mfg. Co., Camden, N. J.

1639—Florence, N. J.—The Florence Thread Co. at this place usually send out inquiries concerning their fuel requirements involving approximately 2,500 tons Somerset County coal on Nov. 1, and the contract is concluded on Jan. 1. Deliveries are made by Pennsylvania R.R. Address Pur. Agt. Thatcher, Florence Thread Co., Florence, N. J.

+1640—Lebanon, Penn.—The American Iron and Steel Manufacturing Co. is receiving bids for a portion of their annual fuel requirements involving approximately 40 000 tons of slack coal. Only a coal running very high in volatile, low in ash, and with sulphur under 1½% will be considered. Address Pur. Agt. George S. Bowman, American Iron and Steel Manufacturing Co., Lebanon, Penn.

1641—Fort Pierre, S. D.—The Board of County Commissioners at this place received bids until 2 p.m., Nov. 16, for furnishing anthracite and bituminous coal in carload lots, bids to include cost of delivery to the Court House. Address Chn. H. L. Jeffries, Bd. of County Comrs., Fort Pierre, S. D.

+1642—Bayonne, N. J.—The City Commissioners will receive bids until 4 p.m., Nov. 23, for furnishing and delivering to the various fire houses and police headquarters, approximately 200 tons anthracite egg and stove coal. Bids are requested only on Wilkes-Barre coal, and a deposit for 10% of the bid must accompany all tenders. Deliveries are to be completed before May 1, 1916. Address City Clk. Wm. P. Lee, Bd. of Comrs., Bayonne, N. J.

+1643—Birmingham, Ala.—The Birmingham Railway, Light and Power Co. contract for their annual requirements of coal, involving approximately 30 tons per day, some time toward the close of the year. Washed slack is required and deliveries are made by railroad. Address Pur. Agt. Chas. P. Doerr, Birmingham Railway, Light and Power Co., Birmingham, Ala.

+1644—Maryland, N. Y.—The Union Free School District No. 2 received bids until 7 p.m., Nov. 8, for furnishing one carload of coal. Address Clk. R. B. Safford, Union Free School Dist. No. 2, Maryland, N. Y.

1645—Wheeling, W. Va.—The City Electric Light Plant at this place contracts some time in December for their annual fuel requirements, involving approximately 3,000 tons of mine-run coal. The business is done on competitive bids, and the customary price is about $1.80 per ton delivered in the bins. Address Supt. W. B. Kain, City Elec. Lt. Plant, Wheeling, W. Va.

1646—Media, Penn.—The Borough Government at this place is in the market for their annual supply of Lykens Valley anthracite pea coal for the year of 1916. Address Clk. Ed. Minton, Media, Penn.

+1647—Ada, Minn.—The Norman County Board received bids until 10 a.m., Nov. 18, for furnishing coal as may be required to the Local Court House during the coming season. Address County Audr. D. E. Fulton, Norman County, Ada, Minn.

+1648—Jersey City, N. J.—Bids will be received by Hudson County until 3 p.m., Nov. 24, for furnishing coal to the county institutions at Jersey City and in Secaucas County. Address Clk. Walter O'Mara, Bd. of Chosen Freeholders, Hudson County, Jersey City, N. J.

+1649—Denver, Colo.—The Mine and Smelter Supply Co. is requesting bids on a 30- to 40-ton car of Piedmont coal. Quotations should be made f.o.b. Denver. Address Gen. Pur. Agt. W. B. Kinkead, The Mine and Smelter Supply Co., Denver, Colo.

+1650—Philadelphia, Penn.—The Department of Supplies will receive bids until noon, Nov. 24, for furnishing the Police and Fire Department with coal during the balance of the current year. Complete details may be obtained from proposal form, Class No. 175, which may be had upon application. Address Director Herman Loeb, Dept. of Supplies, City Hall, Philadelphia, Penn.

+1651—Norfolk, Va.—The United States Engineers will receive bids until noon, Dec. 20, for furnishing approximately 3,000 tons of bituminous coal. For previous bids and awards on this contract, see contract No. 550, Vol. 7, pp. 709, 1004. Complete details may be had on application. Address United States Engineer's Office, Custom House, Norfolk, Va.

1652—Norfolk, Va.—The Navy Department is requesting bids for furnishing and delivering to the local Navy Yard 600 tons of Connellsville coke. Specifications may be obtained on application for schedule No. 9034. Address Paymaster General, Samuel McGowan, Navy Dept., Washington, D. C.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

+1360—Hannibal, Mo.—This contract (p. 411), which provides for furnishing the Board of Public Works with approximately 12,000 tons of coal during the year beginning Oct. 1, has been awarded to the **West End Coal Co.**, of Springfield, Ill., at $1.35 per ton f.o.b. Hannibal for slack, and $1.97 for mine-run. The price at which slack coal was bought last year was $1.34 per ton. Address Supt. A. M. Nipper, Bd. of Pub. Works, Hannibal, Mo.

+1555—McKees Rocks, Penn.—This contract (p. 661), which provides for furnishing the Stowe Township School District with 1¼-in. coal has been awarded to **John B. Beck** at 9½c. per bu. Address Secy. H. E. Emeigh, 907 Russellwood Ave., McKees Rocks, Penn.

1566—Cleveland, Ohio.—This contract (p. 699), which provides for furnishing Cuyahoga County with 2,000 tons of Pittsburgh nut coal, 100 tons of the best grade bituminous lump, and 30 tons of the best Lackawanna egg coal, has been awarded to the **Zettlemyer Coal Co.** Address Clk. E. G. Krause, Cuyahoga County Commissioners, Cleveland, Ohio.

+1567—Hettinger, N. D.—This contract (p. 699), which provides for furnishing the Adams County Board of Commissioners with No. 1 lignite coal has been awarded to **Chas. Hasenwinkle** at $2.90 per ton. Other bids on this contract were: William Fehro, $3; W. A. Overing, $3; W. Hitzman, $3. Address Audr. Walter F. Kelley, Adams County Comr., Hettinger, N. D.

1575—Fountain Springs, Penn.—This contract (p. 700), which provides for furnishing the State Hospital with approximately 2,500 tons of anthracite pea coal, has been awarded to the **Philadelphia & Reading Coal and Iron Co.**, at $2.25 f.o.b. the mine, plus the Pennsylvania State tax. Address Supt. Dr. J. C. Biddle, State Hospital for Injured Persons, Fountain Springs, Penn.

1590—Trenton, N. J.—This contract (p. 736), which provides for furnishing the Pumping Station with approximately 7,000 tons of coal, has been awarded to **The Tattersall Co.**, at $3.60 per ton for 3-in. from the Crow's Nest mine. The contract provides that the coal shall not exceed 8% ash and have at least 14,250 B.t.u. Address City Chemist Parobek, Municipal Bldg., Trenton, N. J.

Contract Notes

Coxsackie, N. Y.—American Valve Co. at this place consumes approximately 600 tons of bituminous and 500 tons of anthracite coal per annum. They have storage capacity for 300 tons, and deliveries are made by railroad.

Daytona, Fla.—The Daytona Public Service Co. consumes approximately 3,600 tons of New River mine-run coal per year, which cost about $5.85 per ton delivered. Address Pur. Agt. H. L. Ogden, 72 Franklin St., Boston, Mass.

Memphis, Tenn.—The contract for furnishing the Park Commissioners with five cars of egg coal has been awarded to the **Brown Coal Co.**, at $4.19 per ton, delivered on switch at McLean Ave. Address Park Commissioners, Memphis, Tenn.

Litchfield, Ill.—The United Gas and Electric Co. at this place consumes about 3,000 tons of Illinois mine-run coal per annum, the approximate cost of which is $1.35 per ton. Purchases are made at the rate of five to ten cars in the open market.

Philadelphia, Penn.—C. Schmidt & Sons Brewing Co., at this place, consume approximately 5,900 tons of bituminous coal per annum. Deliveries are made by railroad as required Address Pur. Agt. R. McAllister, C. Schmidt & Sons Brewing Co., 127 Edward St., Philadelphia, Penn.

Chicago Heights, Ill.—A charge has been made that the city of Chicago Heights, which recently awarded a coal contract for a large tonnage to the Chicago Heights Coal Co., wrongfully refused to consider the lowest bidder. The difference in the bids is said to have been approximately $380.

Winston Station, N. C.—The Chatham Manufacturing Co. at this place, consume approximately 2,500 tons of Pocahontas coal, deliveries being made by railroad as ordered. The company has storage capacity for 300 tons. Address Pur. Agt. H. G. Chatham, Chatham Manufacturing Co., Winston Station, N. C.

Philadelphia, Penn.—R. T. Morehouse consumes about 10,000 tons of anthracite barley, and 5,000 tons of bituminous coal per annum. He has storage capacity for 20,000 tons, and deliveries are made by water in cargo lots. No contracts are made. Address R. T. Morehouse, Bridesburg, Philadelphia, Penn.

Philadelphia, Penn.—Folwell Bros. Co. consume approximately 10,000 tons of bituminous coal per annum. They have storage capacity for 350 tons, and deliveries are made by railroad at the rate of 150 to 250 tons per week. Address Pur. Agt., E. O. Mangen, Folwell Bros. Co., Third and Cambridge St., Philadelphia, Penn.

Cleveland, Ohio—The Union Rolling Mill Co., at this place, consumes approximately 36,000 tons of three-quarter and 9,600 tons of slack Ohio No. 8 coal. Deliveries are made by railroad at the rate of 3,800 tons per month, and the company has a storage capacity for 500 tons. Address Secy. M. L. Hopkins, Union Rolling Mill Co., Aetna Road and East 82d St., Cleveland, Ohio.

Selma, Ala.—The A. G. Kalin Brick Co., at this place, consume approximately 2,900 tons of pea and slack and 2,000 tons of nut and lump coal per annum. Deliveries are made by railroad at the rate of from two to three cars per week, and the company has a storage capacity for 800 tons. Address Pur. Agt. A. G. Kalin, A. G. Kalin Brick Co., Water Ave., Selma, Ala.

Zanesville, Ohio—**Greiner Bros.** were the lowest bidders for the coal supply for the operation of the water-works pumping station at this place and will receive the contract. Their bid was $9,450, or $1.34 a ton. The total amount of the bid was $1,100 less than for the same amount last year. Other bidders were T. A. McIntire, $1.45; W. L. Barker, $1.62½; W. A. Werner, $1.65.

Akron, Ohio—Contracts have been let for 11,500 tons of coal for the city. The **Citizens' Coal Co.** will handle the contract for supplying 5,000 tons of bituminous nut and slack for the water-works and 6,000 tons for the garbage and sewage disposal plant, delivery on tracks only, while the **Klages Coal Co.** will deliver 500 tons at $2.80 for the use of the city buildings.

Foreign Notes

Uruguay.—An American consular officer in Uruguay states that a firm desires to represent American manufacturers of coal and coke. Correspondence may be in English.

Spain—An American consular officer in Spain reports that a man in his district is interested in the importation of American coal for steamers, coke, and coal for gas. The man states that he can use at present 2,000 tons of steam coal, 200 tons of coke, and 500 tons of gas coal. Correspondence should be in Spanish.

Brazil—A firm of commission agents in Brazil informs an American consular officer that it would be pleased to represent American manufacturers and exporters. One member of the firm has had considerable experience in the sale of coal and desires to make a specialty of this. Other lines are not specified. Correspondence may be in English.

Financial Department

Central Coal and Coke Co.

This company reports for year ending Jan. 1, 1915:

Department:	Cent. Coal & Coke 1915 Gross	Cent. Coal & Coke 1915 Net	Delta Land & Tim. Co. 1915 Net	Cent. Coal & Coke 1914 Gross	Cent. Coal & Coke 1914 Net
Wholesale coal	$809,188	$392,620	....	$930,740	$490,742
Retail coal	118,024	10,878	....	126,999	16,570
Wichita coal	22,608	loss 934	....	40,251	3,862
St. Joseph coal	13,868	2,521	....	20,172	7,693
Washer	30,398	loss 1,065	....	43,116	3,552
Stores lumber dept.	....	....	$30,549	....	....
Mining stores	....	127,347	....	....	139,872
Rentals, coal, etc., dept.	....	50,402	3,356	....	31,494
Wholesale lumber	120,523	43,647	305,824	743,229	305,804
Carson mill	....	....	....	839,051	169,276
Keith mill	....	....	....	529,478	96,503
Miscellaneous	....	230	....	....	22,554
Total	....	$625,647	$339,730	....	$1,287,922

INCOME ACCOUNT FOR YEAR ENDING DEC. 31

	Cent. C. & C. Co. 1915	Delta L. & T. Co. 1915	Cent. C. & C. Co. 1914	Cent. C. & C. Co. 1913
Net earnings as above	$625,647	$339,730	$1,287,922	$1,231,472
Deductions:				
Royalty cred. coal lands	$126,120	....	$126,664	$107,655
Royalty cred. timber lds.	....	$310,385	339,865	253,679
Deprec'n mill property	....	65,597	33,987	36,240
Deprec'n washer prop.	4,008	....	4,008	4,008
Deprec'n Kansas City motor trucks	4,544	....	4,544	....
Live stock exting. reserve	11,580	....	....	....
General expense	70,581	44,837	88,819	81,493
Interest on bonds	77,488	52,789	72,990	78,597
Interest and exchange	12,405	17,121	73,041	38,292
Total	$306,726	$490,729	$743,918	$599,963
Surplus earnings	sur $318,921	def $150,999	sur $544,004	sur $631,509
Divs. on pref. stock (5%)	93,750	....	93,750	93,750
Divs. on com. stock	(3) 153,750	....	(6) 307,500	(6) 307,500

BALANCE SHEET YEARS END. JAN. 1 (Cent. C. & C. Co.)

Assets	1915	1914	Liabilities	1915	1914
Coal lands	$4,270,527	$4,324,853	Common stock	$5,125,000	$5,125,000
Timber lands	1,737,130	3,526,350	Preferred stock	1,875,000	1,875,000
Coal shafts and bldg	1,832,939	2,145,579	Bonds	1,258,000	2,059,000
Sawmills and impts	....	492,717	Audited bills	589,973	657,262
Yards and equipment	99,227	99,227	Sundry accts.	42,486	88,124
Personal property	142,029	89,290	Pay roll balances	104,159	125,465
Mo. & La. R.R. stock	....	150,000	Freight charges unadjusted	66,590	82,590
Bev. & So. R.R.	150,000	....	Sink. fund for ins.	204,308	189,250
Bonds, etc., in other companies	319,102	160,102	Bills payable	100,000	1,380,000
Accts. for collection	1,848,047	1,788,4637	Proceeds of sale of Delta land and timber bonds	....	647,832
Inventories	276,271	684,701	Undivided profits	1,594,122	1,624,264
Cash	138,816	328,590			
Sinking fund	75,000	50,000			
Sundry balances	70,550	13,915			
Total	$10,959,638	$13,853,787	**Total**	**$10,959,638**	**$13,853,787**

BALANCE SHEET JAN. 1, 1915 (**Delta Land and Timber Co.**)

(Owning all the timber and lumber properties of Central Coal & Coke Co., which owns the entire capital stock.)

Assets (Total $10,268,466):		Liabilities (Total $10,268,466):	
Timber lands	$8,141,208	Capital stock	$500,000
Mills, machinery and improvements	1,372,617	1st and refdg. M. bonds (V. 98, p. 1002, 841)	1,950,000
Sundry accounts due	127,084	Delta Lumber Co. bonds	750,000
Cash	30,057	Audited bills	154,496
Inventories	308,548	Bills payable	68,000
Deposits for sinking fund	117,495	Timber notes	984,500
Sundry balances	20,710	Pay roll balances	4,162
Profit and loss	150,747	Accrued interest	24,806
		Central Coal & Coke Co.	316,000
		Sundry accounts payable	22,535
		Surplus (unavailable)	5,493,967

⁂

The New River Company

President Robt. H. Gross, under date of May 13, reports for the year ended Mar. 31, 1915:

After paying interest on $2,500,000 outstanding bonds and $600,000 outstanding notes, a profit of $17,538 was earned, which compares with a deficit of $57,422 for the preceding year and a deficit of $211,914 for the year ended Mar. 31, 1913.

For the first six months of the fiscal year the output of the mines operated by subsidiary companies increased while the costs were steadily reduced, and the selling price showed a gain month by month, giving good grounds for the hope that substantial earnings would be made for the year. In October, however, the industrial conditions became so badly demoralized that the demand began to show a falling off, which was reflected in a smaller output with an increased cost and a reduced profit.

The output of the mines shows an increase of 128,747 gross tons for the year, and each month from April to October inclusive shows a gain in tonnage. The output for November, December, February and March fell below 130,000 tons per month, and it was in these months only that losses were sustained, showing conclusively that it is necessary to produce and dispose of a tonnage of 130,000 tons or over per month to prevent showing a loss.

General Manager S. A. Scott, reported on May 8, 1915:

Improvements—New equipment has been added in the form of capital expenditure aggregating $235,351. Virginian Power Co. installations to date at the various mines amount to $198,461. Improvements have been made and taken directly into cost, aggregating $39,397.

The new electrical equipment that is being purchased and installed to take the place of the old steam equipment is being gradually put in place. Installations have been completed at all of the mines on Loup Creek and boilers abandoned. In the Cranberry field, the Beckley installation is completed and Beckley and Mabscott mines and a portion of Sprague are being supplied with Virginian power. It is safe to say that two months more will complete the installations necessary for the use of Virginian power at all our mines excepting Summerlee and Lochgelly, and these will be completed by Oct. 1.

Sales of Coal—Sales were made to the extent of practically 2,000,000 tons early in the year. The close of the year showed that most of the customers had taken only 80% of the coal for which they had contracted. Our average net return on lump coal was the same as the previous year; our egg coal showed an increase of 7c. per ton, run-of-mine, an increase of ½c.; slack, an increase of 15c. The combined grades showed an increased return of 3c. per ton.

The retail yard at Cincinnati was disposed of which completes the sale of all our retail yards, and we have already placed for the next year a greater tonnage in Cincinnati than we have ever handled through our yard.

Outlook for 1915—Our sales department has already booked a substantial tonnage, a great deal of it new business, and there is little doubt that we will close contracts aggregating 2,000,000 tons of coal. The mines are in condition to produce coal up to 2,500,000 tons.

OUTPUT AND EARNS. OF SUBSIDIARY OPER. COS. AND AMOUNTS THEREOF BELONGING TO NEW RIVER CO., YRS. END. MAR. 31

	Output (Tons)		Total Net Profits	
	1914–15	1913–14	1914–15	1913–14
White Oak Fuel Co.	372,030	373,709	loss $30,458	loss $33,258
New River Fuel Co.	....	....	20,823	18,172
Collins Colliery Co.	106,601	116,221	29,622	26,226
Macdonald Colliery Co.	68,533	63,814	4,224	loss 3,558
Cranberry Fuel Co.	194,508	184,618	loss 9,331	6,332
Dunn Loop Coal & Coke Co.	200,546	184,999	66,611	47,024
Harvey Coal & Coke Co.	169,263	133,988	48,295	29,613
Beckley Coal & Coke Co.	86,859	83,740	loss 12,373	loss 14,158
Prudence Coal Co.	139,959	123,852	19,309	1,816
Mabscott Coal & Coke Co	98,410	77,724	27,465	15,270
Price Hill Fuel Co.	....	6,956	loss 5,783	loss 22,958
Stuart Colliery Co.	174,718	133,059	loss 39,947	loss 27,189
Great Kanawha Collieries Co.	....	....	loss 575	loss 11,276
White Oak Coal Co. (wholesale)	....	....	8,283	18,172
White Oak Coal Co. (retail)	....	....	loss 5,726	loss 13,510
White Oak Railway Co.	....	....	1,353	1,507
Piney River & Paint Creek R.R.	....	....	14,461	13,412
Total	1,611,427	1,482,680	$136,253	$51,637
	1914–15	1913–14	1912–13	1911–12
New River Co. propor'n of profit and losses of oper. cost. net	prof. $127,174	prof. $46,255	loss $120,676	loss $132,697
New River Fuel Co., profits for year	....	....	....	27,730
New River Co., losses for year	109,636	103,677	91,239	90,822

There was charged off for depreciation $75,226 in 1914-15, against $57,445 in 1913-14, $84,797 in 1912-13 and $65,920 in 1911-12, and also in 1912-13, $11,251 for plants impairment.

COAL AGE

Vol. 8 NEW YORK, NOVEMBER 27, 1915 No. 22

The Unconsidered Cost

An address to mine owners, managers, superintendents and all who are interested in the cost of producing coal

* * *

DO YOU know where one of the most constant and unconsidered factors in the cost of your business exists—a factor of cost which injures you seriously enough in dull times, but which in prosperous seasons is less considered and is therefore still more harmful?

It is the cost of hiring and firing men. Don't you consider your payroll your greatest single current liability? Don't you have to hustle to get cash to cover your wage accounts oftener than you do to meet other current bills? You can get manufacturers and other large corporations to wait, but there must be no delay in the matter of satisfying your company's liability to its employees.

Your men also are vitally interested in your payroll. It represents to them their possibilities of reward for faithful service and assures creature comforts for themselves and their loved ones.

You are careful enough in some ways about your payroll. You get a good timekeeper and you bond him. But this is not enough. You must dig down and examine closely the composition of the payroll. Serious study must be given to the human elements that it comprises. If the tonnage divided into the gross roll shows a fair cost per ton, the result must be considered favorable. However, it is a poor management that stops here; for it is at this point that the unconsidered loss begins.

This loss is made up of the dollars in wages paid to new and inefficient men—for the training of poor workmen who have no intention of remaining permanently and for competent men whom your foreman through lack of tact or system either fires or lets get away.

This is a drain on the reservoir of resources that too many concerns allow to exist. Mine officials demand the very best machinery and material. They want wire ropes that will not break, locomotives that will not get out of order, mining machines that stand wear and tear, which are all very well. But that manager or superintendent who neglects the biggest factor of all—labor—will have a never-ceasing leak in his reservoir of earnings.

It costs something to hire and train new men, and this cost increases from common to skilled labor. Furthermore, it is an unproductive outlay unless the new men are retained in the organization as dependable productive units.

Each mine official should know how many men it requires to mine and convert any specified quantity of raw material into a saleable product. Using this information as a basis, a quota of men should be established for each department. The number of men employed by each foreman to keep his force intact should be watched carefully. It may be that certain foremen have to hire two or three men to keep one man on the job. What this costs can be ascertained, and it is probable that the result of such an examination will convince you that your foreman had better be replaced by another.

Discover how many efficient men you have by keeping a record of attendance over a long period of time. You can have employees of 80 or 90 per cent efficiency just as easily as you can those of 60 or 70 per cent efficiency.

It is only fair to the man you hire, as well as to yourself, that he be fit for the job he is to fill. *Coal Age* readers would like to hear from those mine officials who have given conscientious study to their payrolls and who have evolved a system or obtained results that are highly creditable.

Neutralizing and Softening Mine Drainage Water

By J. R. Campbell*

SYNOPSIS—Mine water contains temporary and permanent hardness and free acid. In the raw state it is therefore unfit for either coke quenching, boiler feeding or domestic purposes. It may, however, be so treated with lime and soda ash as to be available for these uses at times when other sources of supply become inadequate.

During the falls of 1914 and 1915 there was a scarcity of fresh water in certain sections of the Connellsville coke region, which depended upon impounded water for the operation of the plants. As the shutting down of the plants would have caused a loss of output, which was particularly undesirable in the latter part of 1915, and a high overhead charge, it was determined to utilize the so-called "sulphur water" for industrial purposes, after proper chemical treatment.

The scheme was carried out in its entirety at the United plant of the H. C. Frick Coke Co., where the treated water was used for "watering out" ovens, for boiler feeding, and, with a certain degree of success, for domestic purposes. At other plants, the mine water was simply neutralized and clarified for oven purposes.

The use of the raw water for this latter purpose in the past had always been attended with more or less trouble and expense on account of the "free acid" eating out the yard lines, valves, etc. Moreover, the coke was badly stained with the iron deposit, to which consumers objected. After neutralization and sedimentation, the mine water proved quite satisfactory for quenching purposes. Coke watered in this way could not be distinguished from that on which fresh water had been used.

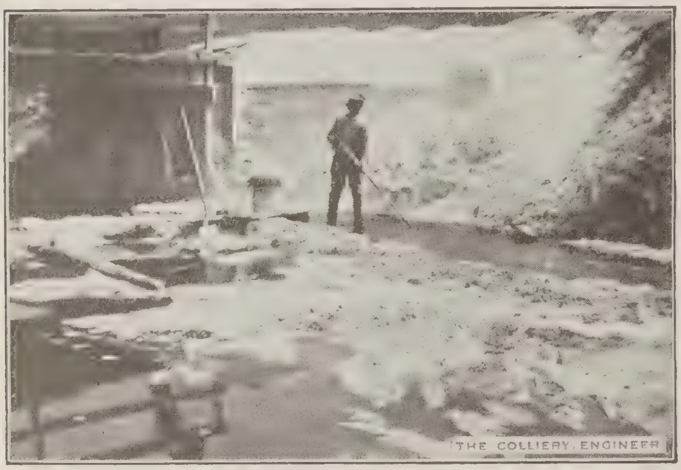

FIG. 1. METHOD OF INTRODUCING THE LIME

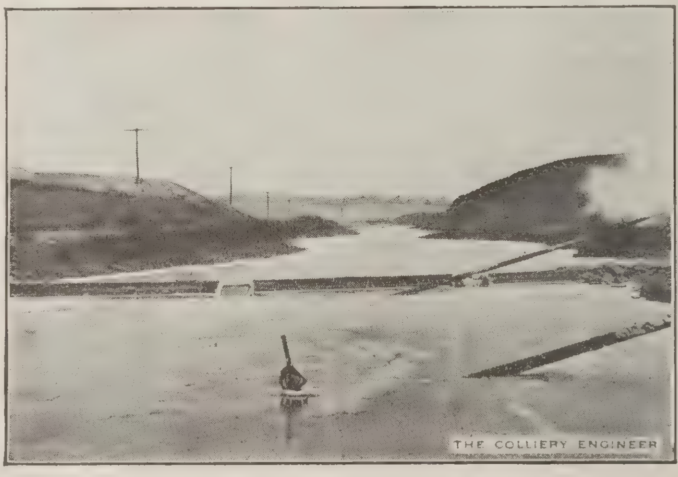

FIG. 2. SEDIMENTATION DAM

Good Sedimentation Was Difficult

The use of neutralized and softened water for boiler feeding was successful, but rather annoying at times, with the crude methods that had to be used. The greatest difficulty was in getting good sedimentation with the continuous method of softening employed. The softened water still carried considerable calcium and magnesium carbonate ($CaCO_3$ and $MgCO_3$) in suspension, which entered the boilers and caused priming. Furthermore, the sludge collected on the tubes and caused them to burn out. Quite a few were lost in this way. On the whole, however, the boiler plant emerged from its siege of mine water in pretty good condition and free from scale.

The completely softened and settled water was satisfactory for washing and scrubbing purposes in the town, but on account of the disagreeable taste caused by the large quantity of sodium carbonate or soda ash (Na_2CO_3) present it was not used for drinking purposes. If the barium carbonate or witherite ($BaCO_3$) method of softening instead of sodium carbonate (soda ash) could be put on a commercial basis, mine water could be freed from practically all objectionable minerals and should prove just as acceptable for drinking purposes as impounded water, certainly more so from a bacteriological standpoint. The neutralized and softened mine water was clear and sparkling. The taste was the only thing against it.

Chemistry of Mine Water Treatment

It is not the purpose of this article to enter into a technical discussion of the composition of mine water and the methods employed in treating it. In fact, no hair-splitting was permissible in this case. Jim Barr, the machinist at United, armed with a bottle of methyl orange and a pinch of soda ash, was the chemist on the job, and he never went far wrong. With the one he knew when the water was neutral, and with the other he could at least tell when enough soda ash was being used.

The well-known lime and soda ash method was employed—the lime to neutralize the "free acid" and to precipitate the iron salts, the soda ash to soften. The manipulation of this process is well illustrated by the method pursued at the United mine.

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*Chief Chemist, H. C. Frick Coke Co.

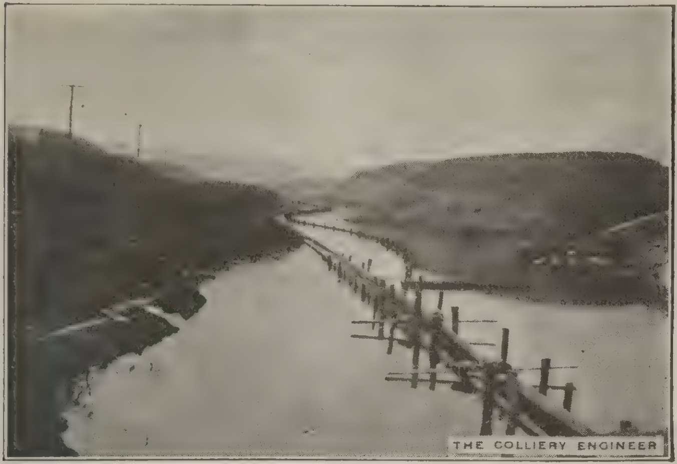
THE COLLIERY ENGINEER

FIG. 3. BYPASS ARRANGEMENT

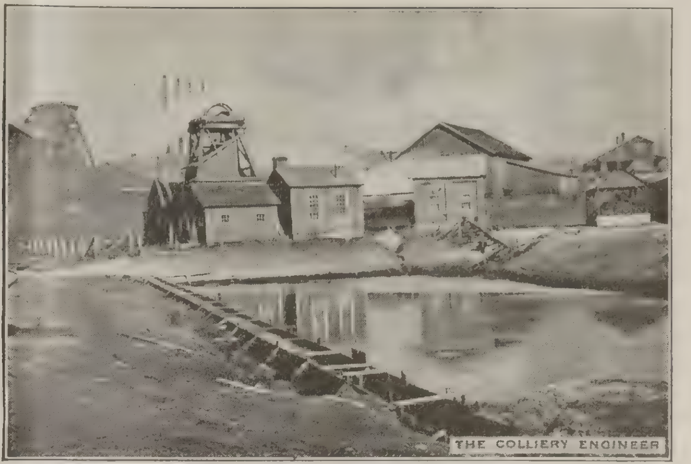
THE COLLIERY ENGINEER

FIG. 4. A TREATMENT FLUME

At this operation the acid mine drainage available was a stream that ran past the plant. Ordinarily it contained considerable fresh water, but in droughts was practically nothing but the drainage from the mines above.

The approximate analysis of the creek water was as follows:

	Grains per U. S. Gal.
Total apparent acidity....................	105
Lime required (80 per cent. CaO)..........	73

To determine the flow of water, a weir was used, which showed from one-half to three-fourths of a million gallons daily. To neutralize all this, on the basis of the analysis, required anywhere from 2½ to 4 tons of lime per day, depending upon the flow of water and its acidity. The lime used was not always well-burned, so there was a loss on that account.

The daily plant requirements were only as follows:

	Gal.
Ovens	170,000
Boilers	100,000
Houses	30,000
Total	300,000

Thus it is seen that to neutralize the whole stream took twice as much lime as was actually needed. During the fall of 1915, arrangements were made to bypass such raw water as was not needed, the arrangement for which is shown in Fig. 3. This bypass was merely a flume down the center of the stream. Similar arrangements were made at all plants using mine water.

Lime Was Introduced by Hand

Fig. 1 shows the "method" of introducing the lime. At the moment of the snapshot, the "mechanism" apparently was not working, but on the whole the method employed was satisfactory. He soon got to know what the bottle of methyl orange was for. The aim was to keep the water neutral to this indicator. The test of the neutralized water showed a permanent hardness ($CaSO_4$) of 228.3 grains per United States gallon.

By the lime treatment, the water is made harder as the lime combines with the free sulphuric acid and forms calcium sulphate ($CaSO_4$). The "free acid" is usually about 10 per cent. of the total acidity. Then again, the lime decomposes the sulphate of iron, forming additional calcium sulphate or permanent hardness.

It is best to go upstream several hundred yards to introduce the lime, then build a series of dams, the supernatant water flowing over the breast of each successively. The precipitate formed by the addition of the lime settles out rapidly. Provision should be made in the dams for sluice gates for flushing purposes, as the basins fill up in a short time with the iron precipitate.

One of these dams is shown in Fig. 2, in which the pump suctions are seen, one delivering neutralized water to storage tanks for "watering out" ovens only and the other sending a supply to a cistern to be further treated for boiler and house purposes. The pump suction should be just under the surface of the water. A good arrangement is to put a wooden box, perforated with holes on top only over the end of the pipe. Where it is possible, it is still better to locate the pump suction in the backwater from the dam.

Treatment Began with the Flume

The lime is added at the upper end of the flume. The treated water enters storage by the gate at the lower flume end. When not treating, all the water is bypassed around the storage dam by closing the gate. The pump suction is in the backwater at the upper end, where clear and neutral water is found longest.

As has been pointed out previously, the chemical reagent used to soften the neutralized water was soda ash—the cheapest and most efficient chemical. By its use, the sulphates of lime and magnesia are converted to sodium sulphate and lime and magnesia carbonates. The sodium sulphate, of course, is soluble, but the carbonates are precipitated.

The general reaction is as follows: $CaSO_4 + Na_2CO_3 = Na_2SO_4 + CaCO_3$. From this reaction, the amount of soda ash is calculated. One grain of calcium sulphate requires 0.85 grain of soda ash for a complete precipitation. On this basis, the daily requirement of soda ash for the water to be used in the boilers and the houses, was from 3,000 to 4,000 lb. in 24 hr.

The method of feeding the soda ash is shown in Fig. 5. It is simply a barrel holding approximately 100 gal. of water, with a spigot at the bottom, allowing the soda ash solution to run into a pipe tapped to the pump discharge.

Fig. 6 shows the cement cistern, of 150,000-gal. capacity, used for storing the softened water. The soda-ash feeder is kept supplied with softened water by a small hand pump. The pump discharge into the cistern is just below the man standing (see Fig. 6). There is a boxlike arrangement over it to direct the discharge toward the bottom of the cistern, to prevent too much agitation.

The outlet for the softened water is a floating valve, shown in the left of Fig. 6, fastened to a raft. This carried off only supernatant water for boilers and houses. The nearer the cistern was kept full the better were the results on account of a greater precipitating depth.

The following tests are self-explanatory:

	Grains per U. S. Gal.		
	Aug. 28	Aug. 30	Aug. 31
Temporary hardness ($CaCO_3$)......	16.149	33.231	28.684
Permanent hardness ($CaSO_4$).......	69.027	13.292	13.992
Total hardness	85.176	46.523	42.676

It will be noted that sufficient soda ash was not used for some little time. While the amount was calculated as closely as possible, the matter of practical test was left in the hands of the machinist, who was instructed to try out the water with a pinch of soda ash in a bottle. As long as a white precipitate appeared, he was to increase the soda ash. In this way numerous chemical analyses were avoided. Under conditions like these it is not possible to make a full mineral analysis.

The completely softened water is shown in the following analysis:

	Grains per U. S. Gal.	
	Sept. 2	Sept. 11
Temporary hardness ($CaCO_3$).............	36.146	28.480
Permanent hardness ($CaSO_4$).............	0.0	0.0
Soda ash (Na_2CO_3)......................	12.360	10.728
Total hardness	36.146	28.480

From this it will be seen that the water was overtreated with soda ash, there being an excess of 10 to 12 grains to the gallon, which was remedied by chemical control instead of the crude method previously outlined, which at the best only showed when enough soda ash was being used. It will be further noted that the total hardness was reduced from 228.3 grains per United States gallon in the neutralized water to 28.48 grains in the softened water—quite a creditable showing under the circumstances. A regular water softener probably would not have shown hardness lower than 6 grains per United States gallon.

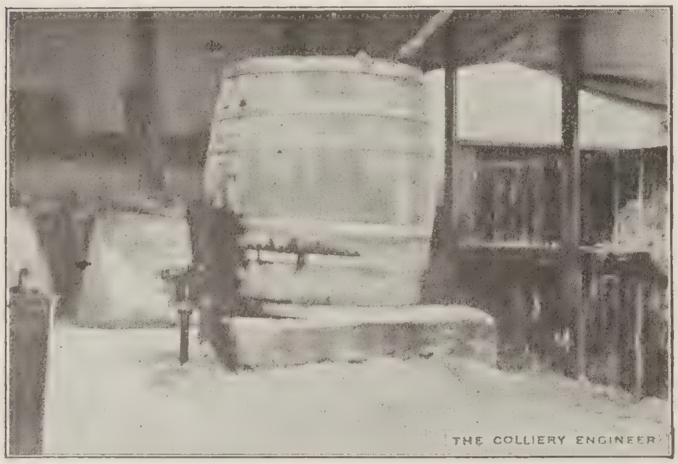

FIG. 5. METHOD OF FEEDING THE SODA ASH

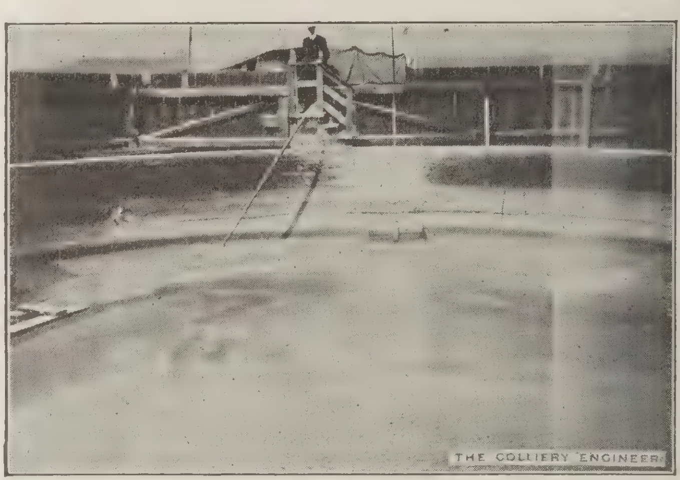

FIG. 6. CEMENT CISTERN FOR SOFTENED WATER

Unremoved Precipitate Was Objectionable

The amount of precipitate still floating in the softened water was objectionable in the boilers, since it caused priming and bagging unless carefully watched. It was possible to keep the sludge out of the boilers by frequent cleaning and blowing off every two or three hours.

If the facilities for softening are good, there should be no reason why mine water could not be used continuously with good success for feed-water purposes. For instance, a small sand filter installed in the case cited would have been a great help in removing the temporary hardness ($CaCO_3$) remaining in the softened water, which was not removed by sedimentation in the cistern; or another settling tank, the size of the one used, would have been beneficial, since it would have permitted the use of completely settled water.

Cost of Treatment

The cost of treatment will be considered under two heads—(a) cost of neutralizing with lime and (b) cost of softening with soda ash for boilers and house use.

Lime is usually figured to cost ¼c. per lb., or about $5 a ton delivered. Thus the chemical cost for neutralizing one-half to three-fourths of a million gallons of mine water daily is approximately $15, to which must be added the labor of stirring it in. Two shifts of men may be necessary. If there are available limestone and fuel in the immediate vicinity, it will pay the operator to burn the lime himself, saving freight.

In the examples cited throughout this article the cost of neutralizing would have to be based on the water used for the boilers and houses as well as for the ovens. From the preceding tables, it will be seen that almost as much was required for the former as for the latter. Had there been an available fresh-water supply for the boilers, the cost of neutralizing would have been comparatively small. Approximately 2½ tons of lime would have been required per day. The total cost for oven water would probably never exceed 2c. per ton of coke.

Soda ash is usually figured at 1c. per lb. delivered. As stated previously, from 3,000 to 4,000 lb. was required daily to furnish a supply of softened water to the boilers and houses. To this cost must be added the labor of introducing it. In round numbers, to soften mine water will cost in the neighborhood of 4c. per ton of coke, under average conditions.

As a general proposition, it would appear that mine water can be neutralized and softened at a cost of from 5c. to 7c. per ton of coke produced, which includes the cost of the chemicals and the labor for introducing them. The cost of installation is not figured in. It usually does not amount to much, if only dams across streams have to be constructed.

The chief thought in presenting the facts enumerated above is to point out the way to other operators who have experienced inconvenience on account of scarcity of water during droughts. It has been the intention to describe the methods and chemicals in such a manner that the scheme can be profitably followed by others. The use of treated mine water for industrial purposes certainly ought to prove more economical than shutting down the plant or hauling in fresh water in tank cars, as has been the practice in the past.

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Extracts from a Superintendent's Diary

Today has been one of those days when everything seems to have gone wrong. Several times during the day I was on the verge of pulling down my rolltop and going home in disgust, but I did not really do that until about 10 minutes before quitting time; then I pulled it down with a slam and went home in a great huff. Had I known what awaited me there I probably would have loitered by the wayside instead of hurrying as I did, but fate has a way of letting things take their course without troubling itself with friendly premonitions.

Arriving home, I jerked open the front door with a wrench that made the hinges groan; and lo and behold, just inside stood my wife awaiting my arrival. My troubles were only beginning.

I am fully aware of the fact that life in a mining camp as wife of the superintendent carries with it for any woman experiences that make the heart bleed, but it is only on rare occasions that I stop to consider that the conduct of the superintendent himself is intimately connected with many of the wife's heartaches, especially the certain wife about whom I am best qualified to speak.

Most of the day I had been so absorbed in my own affairs that I had not given my wife's affairs a thought, and being brought thus suddenly face to face with her, my thinking apparatus seemed to snap; my tongue became useless, and I stood staring at her with such a simple expression on my face that she completely lost control of herself forthwith.

Now that the storm has passed and I have escaped to the quiet of my room to set down on paper my recollection of it, it is hard to realize that it was so serious after all; in fact, part of it seems really ridiculous, especially the stage setting. We never did close the front door, and any of the neighbors who happened to pass must have taken in the speaking part of the entire performance at least.

The tongue lashing that I had to submit to must have lasted about 15 minutes, and in that time my wife crowded a review of hardships endured reaching back over all the years spent in mining villages. Then, getting down to present tense, she heaped coals of fire on my head by recalling that I had completely forgotten all of the orders she had given me that morning, and as a result her sister would not be with us on the morrow, the new Sunday school literature would not arrive in time for next Sunday's use, nor would my wife's letter on "Women's Suffrage" reach her club president in time to be edited and published on the Women's Page of the Sunday edition of the metropolitan daily.

And the end was not yet. It was bad enough to be subjected to all kinds of inconveniences that were chargeable to forgetfulness, for they might be forgiven. But how could one overlook indifference and neglect. The idea of a man taking a woman away from her friends and kindred to an isolated community where all of the dreams of her youth had to be smothered, and then allowing her image to get out of his thoughts for an entire day. Surely nothing more terrible could be imagined.

It will be several days before normal peace and quiet will be restored in our household, and in the meantime I won't overlook any instructions because I won't be intrusted with any.

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Estimated Fuel Consumption of New York City in 1916

The Board of Aldermen of New York City is conducting hearings now on the budget for 1916. The tentative budget has already been passed by the Board of Estimate and Apportionment and is now before the Board of Aldermen for its consideration. The following tabulation shows the tentative appropriation to the various city departments for "fuel" for next year and the value of the coal consumed by the same departments from June 30, 1914, to June 30, 1915:

Department	1916	1915
President, Borough of Manhattan	$77,980.00	$76,224.59
President, Borough of the Bronx	6,300.00	8,773.43
President, Borough of Brooklyn	63,746.00	66,448.20
President, Borough of Queens	24,762.70	16,448.20
President, Borough of Richmond	6,907.00	3,583.51
Board of Education....................	553,659.17	625,986.17
College of the City of New York........	18,291.00	20,321.31
Hunter College	1,598.00	2,399.37
New York Public Library..............	13,000.00	15,203.76
Brooklyn Public Library..............	7,298.00	9,331.40
Queens Public Library.................	1,674.00	1,854.96
Parks, Manhattan and Richmond........	13,005.00	14,951.54
Jumel Mansion	225.00	210.60
Metropolitan Museum of Art...........	11,818.84	11,274.46
New York Aquarium..................	4,500.00	4,458.41
American Museum of Natural History...	2,940.00	2,982.00
Parks, the Bronx......................	4,736.36	5,111.35
New York Botanical Garden...........	10,000.75	11,349.85
New York Zoölogical Garden...........	9,600.00	10,270.14
Parks, Brooklyn	11,100.00	8,041.66
Brooklyn Museum of Arts and Sciences..	6,500.00	6,988.94
Children's Museum, Brooklyn...........	375.00	429.00
Botanical Garden and Arboretum......	1,575.00	1,555.65
Parks, Queens	2,588.00	2,735.11
Staten Island Assn. of Arts and Sciences	150.00	148.50
Police Department	44,305.00	54,570.32
Fire Department	148,285.00	129,108.72
Armory Board	18,296.00	17,500.00
Department of Health.................	75,660.00	88,217.88
Public Charities	243,694.00	271,617.26
Bellevue and Allied Hospitals..........	88,730.00	85,278.63
Water-Supply, Gas and Electricity.....	154,840.00	144,176.00
Street Cleaning	9,033.38	8,808.97
Correction	75,000.00	85,293.52
Department of Bridges................	1,900.00	11,024.47
Docks and Ferries.....................	10,000.60	268,628.18
Sheriff, New York County.............	650.00	721.80
Supreme Court, Appellate Division Court House	1,500.00	1,511.25
Sheriff, Richmond County.............	1,400.00	1,361.00

The Board of Education in its estimate for the year 1916 asks for $553,659.17 with which to buy 116,996 gross tons of coal. In the year ending June 30, 1915, the estimate shows that 112,957 tons of coal was consumed, at a value of $625,986.17. The board also asked for an appropriation of $70,000 to provide for installations for economizing fuel in 70 buildings.

The tentative budget also contains an appropriation of $270,120 for the Department of Docks and Ferries "to be available only for the purpose of making changes on boats affecting the method of firing boilers or for the purchase of fuel for boats and terminals and to provide salaries of stokers employed pending the changes to be made in the boats and terminals."

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Don't ever forget that the man who is asking a small favor today may be the one you will be looking to for aid tomorrow.

A Southern Indiana Washery

By E. P. Stewart*

SYNOPSIS—Abnormally wet conditions and a fireclay floor render the small sizes of coal produced too dirty to be marketable. They are consequently carefully washed and screened before being shipped.

The Ayrshire Coal Co., located at Oakland City, in the southern Indiana field, has recently put in successful operation a modern coal washing and screening plant, designed to carefully prepare into marketable sizes its 2¼-in. screenings. This installation has been made at the company's No. 7 mine, situated at Ayrshire, by the Roberts & Schaefer Co., of Chicago.

The coal bed worked lies close to the surface, resulting in abnormally wet mining conditions. As the coal is undercut by machines and the floor is fireclay, naturally the finer sizes produced contain a great deal of this material. This results in screenings rather difficult to market, especially so in certain seasons of the year. The lump and egg sizes produced are remarkably clean and meet a ready sale, but production of these sizes has been limited because of the difficulty in marketing the slack.

To remedy this condition, a Stewart washer installation was decided upon, with the result that now four sizes of washed coal are produced from the former screenings. The refuse remaining amounts to from 6 to 8 per cent. of the raw screenings and consists of fireclay, slate partings, sulphur and heavy high-ash bone coal. This washed coal is carefully sized.

Chestnut, pea and slack coal are produced in practically equal amounts. There are about two cars of each of these to one of nut coal. The nut coal is the most valuable size and is sold for domestic purposes. The other sizes are used as steam coals and command good prices. Pea and slack sizes are sold for use with stokers.

The washing and spraying process to which the coal is subjected entirely removes the fireclay, leaving the product clean and bright. This coal finds a ready market in competition with Illinois washed coal, and its preparation has brought about the steady operation of the company's mine. A brief description of the plant follows:

The slack is conveyed from the tipple shaker screens to an unwashed-coal storage bin having a capacity of 250 tons. From this bin the material is fed by a screw conveyor to a short elevator, which delivers to one large size Stewart jig. Refuse produced by the washing process is delivered into a small bin and from thence to a refuse car running on a long inclined trestle to the waste pile. The washed coal is settled in a large tank and elevated to the washed-coal sizing screens, located above a 250-ton capacity washed-coal storage bin, divided into four compartments. These screens produce four perfect sizes of washed coal, each size being delivered to its compartment in the storage bin. The sizes are: Through 2¼-in. and over 1¾-in., or nut coal; through 1¾-in. and over 1¼-in., or chestnut; through 1¼-in. and over ½-in., or pea coal; through ½-in., or slack coal.

Each size of coal is thoroughly sprayed and fine coal and fireclay thus removed.

COAL WASHERY OF AYRSHIRE COAL CO. IN INDIANA

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*Chicago, Ill.

The screens are supported by flexible wooden hangers and are driven by wooden connecting-rods from the shaker shaft.

The entire operation requires from 60 to 70 hp. The main washer and screening equipment is driven by a 50-hp. motor. There are two 10-hp. motors driving raw-coal conveyors which transport screenings from tipple to washer. The labor required for operating the plant is usually three men—one at the jig, one looking after machinery in general and oiling and one on the cars loading coal. With the exception of the jig operator there has been no increase in the company's payroll. The cost of washing, taking everything into consideration including power, interest, depreciation, labor, repairs, etc., is approximately 10c. per ton. The cost of the plant was a little under $25,000.

The plant is designed to have a capacity of 45 tons per hr. of unwashed screenings. It has, however, steadily handled upward of 55 tons per hr. The entire equipment and all structures are well-built, and the plant should give satisfactory service for many years.

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Concrete Arches Built Without Wooden Centers

The Clearfield Bituminous Coal Corporation builds small concrete arches without the use of wooden centers. First a stiffened metal lath, such as Self-Centering or Hy-rib, is bent into the form of the arch and supported in place. Then a layer of concrete about 1 in. thick is applied to the upper side. This is allowed to set, and this thin arch of metal lath and concrete constitutes the center of the concrete arch and becomes a part of it. The arch can be finished on the under side by applying a thin layer of concrete with a trowel.

⁂

A Coal-Arch Roof Support

Probably no person connected with the mining of coal is more keenly alive to the difficulties and dangers which surround the daily life of the miner than is the fireboss. It is no surprise therefore, especially to those who know the man, to learn that an important improvement in the method of mining coal has been proposed by Joseph Weatherly, fireboss at the mines of the Consolidated Indiana Coal Co., of Sullivan, Ind.

Consideration of the safety of men and machinery and of the problems of ventilation arising from the resistance to the flow of air offered by irregularities of roof and rib forces the practical mine man to a study of methods of supporting the roof of entries and aircourses. The ideal condition would probably be achieved by a semicircular brick arch, but the cost of such construction puts it entirely out of the question.

Mr. Weatherly has devised a method of roof support using such an arch, not of brick, however, but of coal.

By this system the coal is overcut by an adaptation of the top-cutting mining machine, arranged to form a curved kerf at the elevation of the roof. When the coal below this kerf is removed, that above it is left unshattered and forms a roof-supporting arch of sufficient depth at the ribs to support the overlying stratum and with only enough thickness at the middle to protect the slate from air slacking. This not only produces an ideal entry, having a smooth, safe roof, well-adapted to the economical ventilation of the mine, but effects a great economy in the amount of coal sacrificed to the support of the roof.

Mr. Weatherly has applied for patents to cover this method of roof support and has arranged with the Jeffrey Manufacturing Co., of Columbus, Ohio, for the manufacture of machines to carry out his system.

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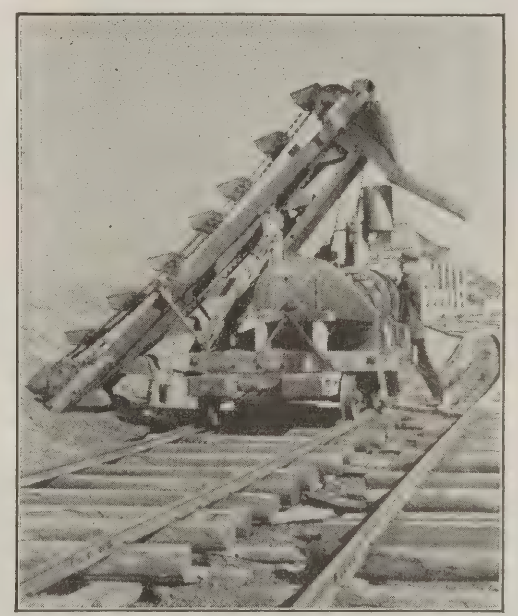
Gasoline Coal Loader

Some time ago the railroads hauling coal out of the Lehigh district made such changes in their stocking arrangements at tidewater that the G. B. Markle Co. found it necessary to stock coal to some extent at the mines. This firm did not wish to make a large investment in equipment and therefore devised means to do the work so far as possible with the machinery on hand.

To reload the coal from the stockpiles a loader driven by a gasoline engine was built. This consists of a chain elevator carried on a boom about 15 ft. long which is hinged at the top. The lower end is raised or lowered by screws on either side operated by bevel gears on a shaft turned by a crank. This boom is made of wood, with the outside faces of the long timbers covered with sheet steel. The shaft at the lower end is adjustable to take up slack in the chain. The whole machine is set on a wood frame and mounted on a mine-car truck.



THE LOADER IN POSITION AT THE STOCKPILE

The loader is driven by a gasoline engine of about 5 hp. There is one reduction by gears and another by the sprocket-chain drive. The machine loads per hour from 10 to 12 mine cars holding 5 tons of coal, the average being about 10 cars. It uses 6 gal. of gasoline in a 9-hr. day.

To keep spilled coal out of the machinery a second chute has been put on. This catches pieces of coal which do not get into the loading chute and carries them back to the stockpile.

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Don't Use Long Words when you write or talk. Short words are best, for they are clear and plain and are known by all. We don't have to think much when we hear or read short words, and that is what we all want. We don't like to think when we don't have to. We like ease. Most great men are great in that they know how to make things plain.

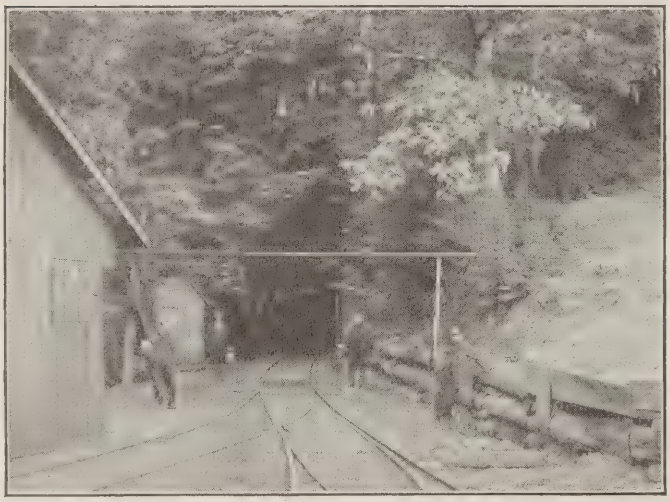
Accident Near Coaldale, Penn.

SYNOPSIS—Details of the rescue of nine men from Foster's Tunnel, near Coaldale, after an entombment of over six days. The men were blindfolded as they left the mine to ease their eyes and avoid undue excitement.

A break occurred in Foster's Tunnel, near Coaldale, Penn., on Sept. 27, at about 11:30 a.m. As a result of the caving of chute No. 24, East Mammoth, bottom split, 11 men were entombed, two of whom were rescued after a 22-hr. imprisonment, while the other nine were entombed for six days and five hours, with no food except that which remained in the dinner pails of six of the men who were fortunate enough to have them practically within their grasp when the break occurred.

Two of the men were working in a slant chute driven eastward off No. 24 straight chute, and the break occurred at the face of this slant working. The men had a few moments' warning and were able to run down the slant chute, but before they could climb up the straight chute the water had risen to their hips. They were able to pass from this point through a crosscut to another chute, where they remained for 22 hr., until the rescue party found them.

The air and water were driven so forcibly by the action of the cave that the sides of chutes Nos. 24, 23 and 22 were washed out, and the water carried rocks, coal, dirt and timbers into the gangway, filling it from chute No. 2 to chute No. 19, to a depth of from 2 to 6 ft. From chute No. 19 to chute No. 26, the gangway was entirely blocked with the timbers and material, and these were wedged in so tightly that they held the water behind them.



MOUTH OF FOSTER'S TUNNEL

Men Shut Off by Cave Climb into Safety

When the mine cave occurred, a loader, driver, chuteman and switch boy were unloading timber in the gangway in the vicinity of chute No. 29, three men were working at the face of the gangway, and two other men were working in chute No. 29. Upon hearing the fall and rushing wind, they hastened to chute No. 26; but finding the airway, or "monkey," completely blocked, making their escape impossible, the nine men climbed into chute No. 27—the longest chute in the workings—and remained there until found by the rescue party.

Between chutes Nos. 26 and 27 the vein had entirely pinched out, and the airway was being driven outward from chute No. 27 to chute No. 26, there still remaining but 6 ft. to be driven. It was due to this fact that the men were protected from the blackdamp which later found its way into chutes Nos. 26 and 25. From chute No. 26 inward the water in the gangway steadily rose until it was above the collars, thus making a water-seal at the bottom of chute No. 27.

When the men were found by the rescue party, their physical condition was better than expected, although they were suffering from hunger and the numbness due to the wetting of their clothing. A light had been kept burning for about half of the time, or until their supply of paraffin ("Sunshine") had become exhausted.

The rescue party was composed of about 300 men, who worked in three shifts. While the débris was being cleaned up from chutes Nos. 2 to 19, so that mine cars could be operated, a small opening about 4 ft. square was being advanced from No. 19 chute. At chute No. 20 two steel mine cars were found jammed in with other wreckage, and these had to be cut apart with oxyacetylene burners. The water was working its way through the débris in considerable volume, and 3-in. pipes were driven through the rubbish in order to permit the rescuers to tap the water. Two electric pumps were used, and later two additional air pumps were installed to keep the water away from the rescuers at the face. Electric lights were installed wherever the rescuers worked, and an additional compressed-air line was laid to operate drills and to improve the ventilation.

Reopened Airway with Bucket Brigade

The airway, or "monkey," 30 ft. above the gangway, was also entirely closed to chute No. 19, and was reopened with great difficulty. It was necessary to handle the material in water buckets, at times more than 50 men being employed on a shift passing these buckets from one to the other. In addition to this, a crosscut was driven from the top of chute No. 17 to chute No. 22, about 200 ft. above the gangway, in the hope that the upper portions of some of the chutes were open and that it would be possible to get down into them and find a way to the men entombed.

When chute No. 25 had been reached through the airway, a heavy body of blackdamp was met, which had to be removed by compressed air conducted to this point through 500 ft. of 2½-in. fire hose. After the blackdamp was removed, it was possible to travel down chute No. 26, which was partly filled with débris, and it was found that the water was standing in the gangway as high as the collars. During the next 8 hr. the depth of this water was reduced by about 3 ft., and several of the rescuemen traveled through the water from chute to chute to make a search.

As soon as the entombed men were found in chute No. 27, a platform was quickly constructed along the legs of the gangway timber sets. The men were assisted down No. 27 chute to this platform, taken up chute No. 26, and then outward through the airway to chute No. 19, about ½ hr. being consumed in transferring the men in their weakened condition through this route.

Careful Treatment of Rescued Men

The entombed men were given stimulants in chute No. 27 before they were moved and again as soon as they reached the gangway at the foot of chute No. 19. All the time the men were entombed several doctors were in attendance to render first aid whenever needed. There was also a first-aid and helmet corps of trained employees in continual attendance, who were supplied with lungmotors, pulmotors and all the medical equipment that could possibly be required. The stimulants were hot, clear coffee, and only small portions were administered at one time.

Not a word of the rescue had been allowed to reach the outside world. Consequently the public did not know that the men had been reached until the first man appeared at the mine opening on a stretcher supported by willing helpers. The assemblage of about 5,000 people at the tunnel mouth had no notice that something unusual was about to happen until the ambulances arrived. This was only a few minutes before the appearance of the rescued men at the tunnel mouth. These men had been covered with blankets, and gauze had been placed over their eyes to prevent the light from affecting their sight and also that they might not become unduly excited by the presence of the spectators.

RESCUED MEN LEAVING THE PANTHER CREEK VALLEY HOSPITAL

Reading from left to right: Top row—Joe Lagonis, Michael Cutodi, Peter Lahonnick. Second row—Charles Matokas, John McAndrew, Domnic Hotcheck, William Watkins. Bottom row—John Bonner, Joseph Murphy, Elmer Herring, George Hollywood

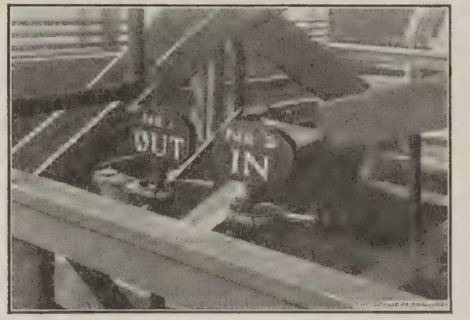
Ropes had been drawn around the tunnel mouth to prevent the people from getting within a radius of 125 ft. of the entrance; and when the first of the men was brought to the outside hardly a murmur could be heard, and this quietness continued until the last man had been taken away. The transference of the men was performed with all the silence, precision and decorum of a great funeral, the removal being witnessed quietly by the great crowd, as everyone realized that any outcry would have a dangerous effect on the men.

Despite the feeling that the rescue was the great event in the history of the Lehigh Coal and Navigation Co.'s mines, the interested spectators, in order to meet the urgent needs of the victims, restrained their ardor in a most commendable manner. The rescued men were at once removed to the State Hospital at Coaldale, where they were detained for about a week, until Dr. Shifferstine, the superintendent, decided they had fully recovered from the effects of exposure.

Safety in Loading Coal

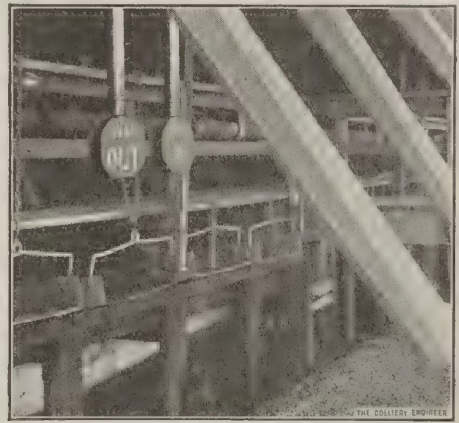
In anthracite breakers large hoppers or pockets are constructed to receive the different sizes of coal. The railroad cars are then loaded direct from these pockets.

To prevent a man who for any reason is down in a pocket from being drawn down by the action of coal being loaded from that pocket, the Susquehanna Coal Co. has adopted the scheme shown in the illustration.



INDICATORS ABOVE BINS

The upper photograph illustrates the top of the pocket. The one on the left has no one in it and the sign reads "Out." Should a workman have occasion to go down into the pocket, he turns the signal by the handle to the "In" position. These signals are connected to the ones at the chutes below by a continuous shaft or pipe. With these signals in use, coal is only drawn from those pockets registering "Out."



INDICATORS BELOW BINS

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A Particularly Despicable Form of Theft is practiced in coal mines both here and in Great Britain. In the mines of both countries it is the custom of the miners to attach numbers to the full cars for identification purposes on payday, payment of course being made according to the amount of coal got. These numbers have been known to be changed, with the result that scamps disinclined to work themselves have got the credit and the cash due to the hard-working miner. The latter on searching the surface has often been puzzled to know how he only filled four cars when he himself had counted, say, five, but the evidence of the number is final until the thief is caught red-handed.

Superior Coal Co.'s Mines

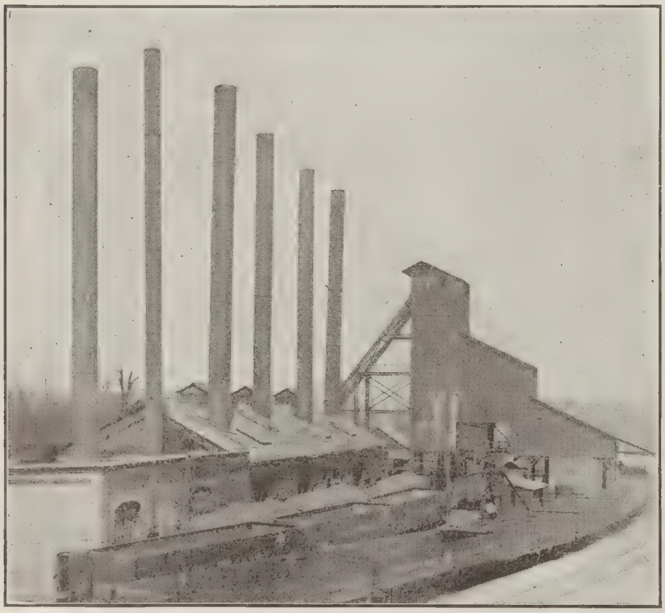
The Superior Coal Co. of Illinois has three of the largest coal-producing mines in that state and one of the largest coal washers in the country. These mines are numbered 1, 2 and 3 and are located about 45 mi. northeast of St. Louis, on the Chicago & Northeastern R.R., to which they are subsidiary.

The mines, which were opened about 10 years ago, are similar in nearly every particular. The method of mining is the two-entry room-and-pillar system. The rooms are driven 30 ft. wide on 50 ft. centers. The entries are driven 21 ft. wide on 60 ft. centers, where they are intended for main ventilating and haulage roads. Where they are butt entries they are driven 50 ft. apart. The seam mined is No. 6 and it averages 7½ ft. in thickness.

No. 1 mine operated only 202 days in the year 1914 and produced 748,463 tons of coal, thus making a daily average of 3,688 tons per day. Its record is 4,530 tons for a single 8-hr. shift. The mine is equipped with two 12-ton Jeffrey locomotives on one side of the workings and one 12-ton and a 6-ton Jeffrey on the other side. None of these do any gathering. A 6-ton Goodman gathering locomotive is used to take the coal from the men in the rooms and place it on a parting for the big locomotives to bring to the shaft bottom. About 600 men and 30 mules are employed. The mine has 90 entries under development and 230 rooms working.

LARGER RUN THAN ANY OTHER MINE IN STATE

No. 2 mine operated 208 days in 1914 and produced 843,820 tons, making a daily average of 4,049 tons. Its record run was 5,133 tons in an 8-hr. shift, which has not been exceeded by any other shaft in the state. On one side of this mine two 12-ton Jeffrey locomotives are in use, and on the other side one 15-ton and a 6-ton Jeffrey are installed. Thus four locomotives are used to bring cars to the bottom. There is also a gathering locomotive of Jeffrey make and 27 mules which together gather the coal to the partings. The mine employs on an average 675 men. It has 88 entries and 250 rooms.


POWER HOUSE AND TIPPLE OF SUPERIOR COAL CO. AT SAWYERVILLE, ILL.

No. 3 mine only operated 195 days. It produced in that time 785,508 tons, making a daily average of 4,011 tons. The maximum output hoisted in a day of 8 hr. was 5,116 tons. The mine has two 15-ton Jeffrey locomotives, one on each side of the workings, which bring the coal from the inside partings to the foot of the shaft. A 6-ton Jeffrey locomotive is used for relaying coal from several small partings. Two 5-ton Goodman locomotives gather the coal from the miners in their rooms and bring it out to a large parting, from which it is hauled to the shaft parting by one of the big locomotives. In the work of gathering, the Goodman units are aided by 29 mules. The mine employs on an average 680 men. It has 86 entries and 250 rooms.

SUPERIOR COAL CO.'S WASHERY, ONE OF THE LARGEST IN ILLINOIS

The coal in these mines is undermined by shortwall breast machines and punchers, 107 in all. Jeffrey, Ingersoll-Rand, Sullivan and Harrison types of cutting machines are all represented. Near each shaft bottom a switchboard is located with four switches, one for the machines and one for the locomotives on each side of the shaft. The feed wire for the machines is on the main roads with a separate switch for each entry.

WASHER CAN HANDLE 3,000 TONS PER DAY

Only one-half of the washer was operated last year. A daily average of 1,359 tons of washer coal per day was maintained. The record is 1,530 tons in 8 hr. The building was erected and equipped by the American Washer Co. and, as has been said, is the largest in the United States. There are eight jigs of the Stewart type. The screenings are unloaded into the bins over the jigs by a combination spiral-drag and bucket-elevator system.

The mines were opened to produce only 2,500 tons per day, but by building up an excellent organization the remarkable excess over expected capacity has been reached. John P. Reese is general superintendent, and he is assisted in his work by John H. Ross, superintendent, and P. H. Shanahan, assistant superintendent.

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The Best Raw Coal in Brazil contains about 35 per cent. of ash, of which 6 per cent. is sulphur, according to I. C. White, of Morgantown, W. Va., who was chief of the Brazilian Coal Commission from 1904 to 1906. A cargo of coal shipped to Kalk, Germany, was crushed and washed and yielded 33 per cent. of briquetting coal containing only 10 to 12 per cent. of ash (of which 1 per cent. was sulphur) and 42 per cent. of slack coal, with 25 per cent. of ash and low in sulphur. So only about one-third of this coal could be converted into coke of a fair quality. The coal is located 1,000 mi. away from the iron-ore and limestone deposits of Brazil, and the country to be traversed is extremely difficult, there being a great wall of granite 2,000 to 3,000 ft. high to be surmounted by the use of deep cuts and tunnels.

Work Accomplished by the Illinois Miners' and Mechanics' Institutes

SYNOPSIS—The following address, delivered by R. Y. Williams, director of the Institutes before their abandonment, gives a brief but succinct outline of the results attained in a year and a half since the organization was formed. The address was made before the Mine Inspectors' Institute of the United States of America, at its eighth annual meeting, St. Louis, Mo., June 8-11, 1915.

It is my privilege during the 10 minutes which has been allotted to me, to address you on the new educational endeavor that was recently begun in Illinois by the Miners' and Mechanics' Institutes. It is a pleasure for me to address you on this subject because the mine inspector, probably more than any other individual, spends the greater part of his time in the consideration of mining methods that will bring about the prevention of accidents and the conservation of natural and created resources. It is my hope that you will have suggestions to make that will assist me in bringing about the maximum of efficiency in this new work.

Before an audience of this kind, it is hardly necessary to draw attention to the need of educational work among coal-mine employees. Suffice it to say that the state, by legal enactment, requires applicants for the position of mine inspector, mine manager [foreman], mine examiner [fireboss] or hoisting engineer to have a certificate of competency certifying that the candidate has passed a combined written and oral examination given by the mining board. Every miner, also, must have a certificate issued by the miners' examining board, based on an oral examination to determine his qualifications as a practical miner. It seems only consistent, therefore, that the state should furnish the means whereby miners may obtain the education necessary to pass such examinations. If those who are to be responsible for the acts of the men under them are required to have certain technical qualifications, it is evident that the desideratum would be accomplished if the men at the face had similar technical ability.

The statement is often made that one of the necessary things about a mine is discipline. In this connection discipline means "training resulting from a course of study in coal mining designed to qualify employees for harmonious and effective action." If all the records were known it would be found that "familiarity" instead of "breeding contempt" breeds efficiency.

Attitude of State Mine Inspectors Toward Educational Work

An inspector from West Virginia has said "education is the best preventative of mine accidents" and an Oklahoma inspector has thought that "it should be made a criminal offence to employ inexperienced men." In the printed proceedings of the past meetings of the Mine Inspectors' Institute, it is clearly evident that the mine inspectors of the United States believe that the general causes of mine accidents are ignorance and carelessness, and that the remedies for this are education, discipline and prosecution.

In Illinois, an appropriation of $15,000 per annum became available Jan. 1, 1914, for the promotion of the technical efficiency of all persons working in and about the mines of the state. In order that this appropriation might be used to assist in removing the general causes of mine accidents, a careful preliminary study was made of the specific causes of those accidents that appeared to result from ignorance and carelessness. In the following table there are given the ten specific causes of such accidents, in the mines of Illinois, during 1913 and 1914. The relative importance of these causes is shown by the proportion of accidents they produce and the educational courses in the Miners' and Mechanics' Institutes are designed to cover these subjects.

What the Course Includes

As given by the Institutes, the educational courses named below include a detailed study of the proper methods of procedure in each case; a consideration of the wrong ways of doing things, which invite accidents; and a statement of the state mining law governing the point in question. A man who is faithful to the work of the night schools is able to free himself from the blight of ignorance and to cope successfully with the dangers of mining.

MINE ACCIDENTS IN ILLINOIS, 1913 AND 1914

Causes of Accidents	Number Killed	Percentage of Fatalities	Educational Courses Methods of Mining Coal
Falls of roof and coal........	168	50.3	Geology Surveying
Cars, motors and mules......	92	27.5	Haulage Drainage
Gas........................	16	4.8	Mine Gases and Safety Lamps Ventilation Fire Protection
Blasting and explosives.......	16	4.8	Explosives
Shafts, cages, etc............	14	4.2	Hoisting Surface Plant
Machinery, R.R. cars, etc....	13	3.9	Coal as Fuel
Electrocution...............	12	3.6	Electricity applied to mining
Drowned....................	2	0.6	Drainage
Steam......................	1	0.3	Steam
Total.....................	334	100.0	

The list of topics and the time devoted to each topic in the two-year course is as follows:

Group	Number of Course	Subject	Number of Evening Sessions
A	1	Methods of mining	10
	2	Timbering	5
	3	Ventilation	8
B	4	Mine Gases and Safety Lamps	5
	5	Special underground rooms	2
C	6	Geology	5
	7	Surveying	10
D	8	Coal, a fuel	5
	9	Surface plant	5
	10	Steam	5
E	11	Hoisting	7
	12	Haulage	8
F	13	Fire protection	5
	14	Electricity	10
G	15	Drainage	6
	16	Explosives	9
		Review	7
		Total...............	112

In order that the men who work hard at the coal face in a mine during the day may not be discouraged by attempting too much study, it has been the plan at each town where classes have been organized to hold two meetings each week and to spend two hours at each meeting. By dividing the general subject of coal mining into 16 topics, and by allotting such time to each topic as will cause the complete course to extend over a period of two years, the Institutes have offered a plan by which men are able to continue full time at work, while obtaining the desired technical knowledge. In this way, the student increases his practical experience at the same time that he gains a knowledge of the theory of mining and he finds that both the practical and technical work are advantageous to him in the position of enlarged responsibility for which he is striving.

EQUIPMENT PURCHASED FOR THE WORK

In order that these courses may be of practical value to the men, a very complete equipment of apparatus and books has been purchased for the demonstration of the fundamental principles of chemistry, physics, mechanics and electricity as applied to mining, and in order that the men may become skilled in the use of safety lamps, surveying instruments, drafting appliances, hygrometers, water gages, dynamos, motors and electrical meters. The use of this equipment has met with a great deal of success in the conduct of the courses.

The towns at which two-year courses have been inaugurated, the date of organization, the total number of evening sessions, and the attendance at each place, are as follows:

Towns	Counties	Date of Organization 1914-1915	Total Number of Evening Sessions	Attendance Average	Total
Belleville	St. Clair	March 18, 1914	77	16	1,246
Benton	Franklin	October 7, 1914	53	13	698
Carterville	Williamson	January 9, 1915	36	22	806
Centralia	Marion	October 7, 1914	39	21	826
Collinsville	Madison	April 2, 1914	84	24	2,042
Duquoin	Perry	March 29, 1915	10	22	219
Gillespie	Macoupin	October 9, 1914	61	25	1,546
Harrisburg	Saline	March 23, 1914	101	16	1,652
Herrin	Williamson	March 26, 1914	134	20	2,745
O'Fallon	St. Clair	February 6, 1915	14	19	261
Pana	Christian	January 12, 1915	24	32	758
Pekin	Tazewell	October 1, 1914	33	13	422
Peoria	Peoria	October 1, 1914	64	23	1,436
Springfield	Sangamon	October 5, 1914	62	28	1,710
Staunton	Macoupin	May 4, 1914	85	28	2,343
Thayer	Sangamon	November 2, 1914	64	15	957
Troy	Madison	October 8, 1914	56	22	1,240
Worden	Madison	January 21, 1915	34	6	207
Total					21,114

The total enrollment during the year was 1,432 students.

Arithmetic is a study in which a large majority of the men in the classes are interested; during the past year nearly one-third of the time of each lecture has been devoted to a consideration of this subject, and in some towns separate classes have been organized to pay special attention to it. One student, who is 50 years of age, was unable at the time of enrolling in the class to perform simple addition. At the completion of the first course he was able to work in fractions. Because of the large amount of attention that must be given to arithmetic, it has been found that the classes in many towns require a period in excess of 2 years to complete the entire mining course.

COÖPERATION WITH PUBLIC SCHOOLS

This large number of night schools has been possible because of the coöperation of the Institutes with high and graded schools. Many public schools are located in districts where coal mines offer practically the only employment and where many of the pupils are looking forward to work in the mines as soon as the law will permit them to enter. Before the establishment of the Institutes, some high schools in these districts had requested assistance from the Department of Mining Engineering at the University of Illinois, but were unable to receive such help because of the lack of funds. Agreements have been made with a number of these schools by which the Illinois Miners' and Mechanics' Institutes offer evening classes for men who are employed during the day in the mines, in order that they may be fitted for more efficient service and more profitable employment.

The school boards have allowed the classes to meet without charge in the school buildings and also to use the chemical and physical equipment provided. In most cases, light, heat, and janitor service have also been provided free to the students.

The Institutes heartily acknowledge their indebtedness to the various school boards, superintendents and teachers who have thus coöperated in the organization and conduct of evening classes, and who have been coequal with the Institutes in bringing about local interest and in maintaining successful courses.

In addition to the work outlined above, the Institutes have held special meetings for the illustration of safe methods of mining coal. At twelve of these meetings the attendance was 7,905. The Institutes also have published 3 bulletins, 4 circulars, 3 instruction pamphlets and 1 annual report. They have held two six-weeks' short courses, at the University of Illinois. At the last short course, 28 men from the mines took the entire course in coal mining.

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Outlook in Coal Mining

In the Oct. 9 and Oct. 16 issues of *Coal Age* we printed several columns of comments from prominent coal-mining people relative to the prospects for business in the coal industry this fall and winter. Additional opinions are here given:

ALABAMA	
W. D. Leake, Gen. Mgr., Caledonia Coal Co., Jasper	Good
ARKANSAS	
C. P. Wilson, Secy. and Treas., Harper Coal and Coke Co., Fort Smith	Much better than previous years
CANADA	
W. B. Christie, Red Deer Valley Coal Co., Ltd., Calgary, Alta	Extra good
COLORADO	
James E. Brooks, Pres., Brooks-Harrison Fuel Co., Louisville	Good
W. O. Sherman, Gen. Mgr., Baldy Coal Co., Trinidad	Improved
Louisville Coal and Land Co., Firestone	Fair
M. B. Nequhart, Denver	Good
ILLINOIS	
Silver Creek Colliery Co., Farmington	Good
KENTUCKY	
H. D. Parrish, Pres., Sturgeon Creek Coal Co., Beattyville	Excellent
MICHIGAN	
Jewett, Bigelow & Brooks, Detroit	Good
MISSOURI	
Grand River Coal Co., Cainsville	Very good. We have operated every day since Aug. 19, with prospects for running every day until spring.
C. B. Moore, Northern Central Coal Co., Higbee	Good
MONTANA	
George W. Wilson, Pres., Carbon Coal Co., Sand Coulee	Improved prospects
NORTH DAKOTA	
McClure Coal Co., Minot	The best in 5 yr.
PENNSYLVANIA	
Standard Coal Mining Co., Grove City	Good. Shortage of miners will make coal scarce
VIRGINIA	
Lee Long, Gen. Supt., Clinchfield Coal Corp., Dante	Good
WYOMING	
John Martin, Gen. Mgr., Bear River Coal Co., Evanston	Good. Wyoming has immense quantities of high-grade coal
H. S. Hopka, Gen. Mgr., Sheridan Coal Co., Dietz	About normal. A cold winter means big output

A Power-Driven Coal Auger

In the past the drilling of coal has been done mostly by hand, or more recently by portable electric or compressed-air augers. The hand method requires from 20 min. to ½ hr. to bore a hole of the ordinary depth, which means a considerable loss of the miner's time.

Portable machines, operated by either electricity or compressed air, have been introduced and are used to a certain extent. The operators of such machines are usually paid at a specified price per ton of coal produced or at a given rate of wages per day. Such augers will generally bore a hole in about 1½ min., and if the time of drilling were the only point to be considered, this type of machine would doubtless have been generally adopted long ago.

The amount which may be deducted from the coal loader for having the drilling done by power has been determined and agreed upon in various mining districts. The rates fixed are such that when the total expense is taken into consideration the reduction in cost of coal is at best small. It is therefore apparent that the only kind of power auger which will be of any considerable value must be of such construction that it can be operated with a small amount of labor and low cost for repairs. These results are claimed for an auger manufactured by the Fairmont Mining Machinery Co., of Fairmont, W. Va.

This auger is used in connection with an undercutting machine, and both are operated by the same motor. The time taken to drill a hole 7 ft. deep is about 1 min., while no time is consumed in moving the auger from place to place, since it is attached to and made a part of the machine and moves with it from room to room.

The only time to be paid for by the mine owner is that actually occupied by the machine runner in adjusting the auger and boring the hole. The flexibility of the auger, with the small number of working parts, enables the runner to adjust it quickly, and but little time is occupied in the entire operation of setting up the auger and boring the hole. The necessity for high rates of wages for this part of the work is accordingly overcome, and the mine owner may share the gain with the regular machine runner. This does not in any way change the relation of the loader to the mine owner, and the reduction provided for by the scale can be properly made, the same as is done in the case of the portable auger.

The auger is attached to the machine, but is so arranged that the hole may be placed wherever desired. The auger, frame and driving mechanism may be laid flat on the top of the motor when the cutting machine is being moved from place to place. The drilling may be done properly and the cutting machine moved without any appreciable loss of time on the part of the machine runner.

It has also been demonstrated that more coal is produced at each cutting when the machine runner does his own drilling than when the loader does this work. This in itself is a source of increased revenue to the machine runner and has proved to be one of the most important advantages in the adoption of the auger by the mine owner. It has been found also that a rate not to exceed ½c. per ton wholly compensates the machine runner for the time occupied in doing this drilling.

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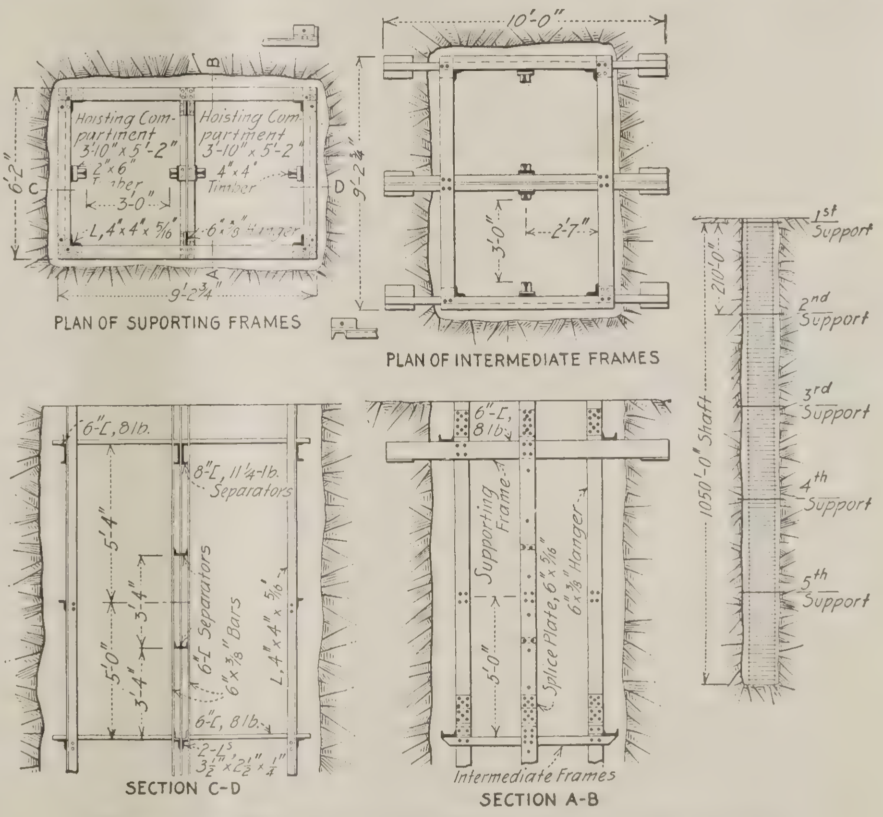
Shaft Timbering of Steel

R. H. Cromwell in the *School of Mines Quarterly* of Columbia University describes a steel shaft lining, and from his account the following is abstracted:

At the Los Ocotes copper mine in the State of Oaxaca, Mexico, an 800-ft. shaft was timbered with steel, the details of the shaft-set being shown in the accompanying sketch. Supporting, or bearer, sets made up of 8-in. steel channels were cemented into hitches cut in the side of the wall. These supporting sets were installed just below the collar and at 210-ft. intervals in the shaft. All the steel, before being placed, was painted with a mixture of coal-tar and turpentine. From the surface to the 600-ft. level, sets were put in 10 ft. apart. From the 600- to 800-ft. level, because the ground showed a tendency to cave, the sets were put in every 5 ft. The lagging of 2-in. planks was laid lengthwise between the sets.



DETAIL OF STEEL-SHAFT TIMBERING, LOS OCOTES MINE

For timbering this shaft about 73 tons of steel was required, costing approximately $100 United States currency per ton laid down at the mine. A steel gallows frame was erected containing 15 tons of steel, which cost about $140 United States currency per ton delivered on the ground. This is at the rate of 5c. and 7c. per lb. and does not include the cost of erection.

How Heat Affects Concrete

In the University of Illinois bulletin entitled "Influence of Temperature on the Strength of Concrete," A. B. McDaniel, assistant professor of engineering, reaches the following conclusions regarding his experiments with concrete:

1. Under uniform temperature conditions there was an increase of compressive strength with age within the limits of the tests. In no test was the concrete matured for more than 44 days, and in many of the tests no specimen was crushed after a period of 28 days. For any given temperature the rate of increase in strength declines as the specimen becomes older. For the specimens tested under normal and uniform hardening temperature conditions of from 60 deg. to 70 deg. F., the compressive strength of the concrete after 7, 14 and 21 days is approximately 50 per cent., 75 per cent. and 90 per cent. respectively of the strength attained after 28 days.

For low temperatures the percentage values are less, and for higher temperatures the percentages are higher.

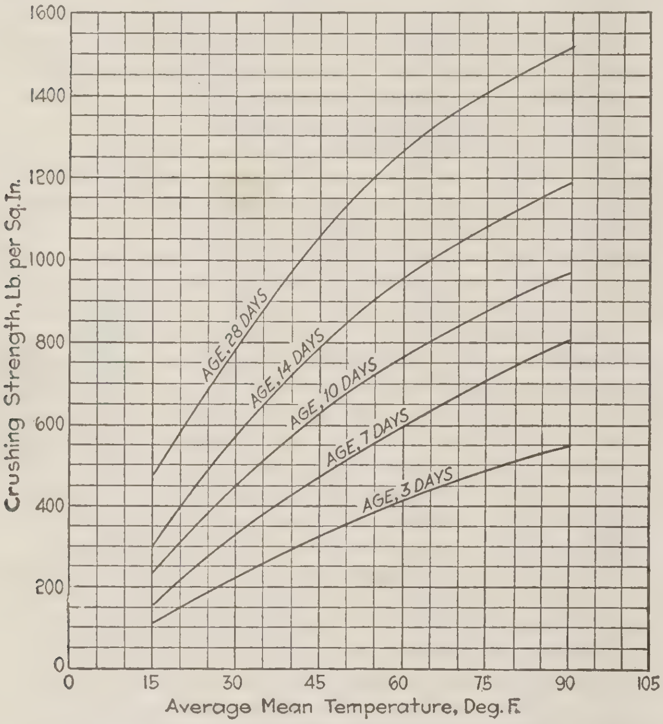


FIG. 1. RELATION OF STRENGTH TO TEMPERATURE FOR DIFFERENT AGES OF CONCRETE

The relation between the percentage values at the ages of 7, 14, 21 and 28 days is nearly the same for temperature conditions from 30 deg. to 70 deg. F. However, the values for the lower temperatures should be used with caution.

2. Concrete maintained at a temperature of 60 deg. to 70 deg. F. will at the age of one week have practically double the strength of the same material which is kept at a temperature of 32 deg. to 40 deg. F.

3. Figs. 1 and 2 may be used to determine the representative strength of concrete similar to that used in the tests for various temperature conditions and for ages up to 28 days. The concrete used in the tests consisted of 1 part cement, 2.2 parts sand and 3.6 parts broken stone by volume. It should be noted that in the investigation the specimens were stored at temperatures which were nearly uniform.

When there were a number of alternations above and below the freezing point, the specimens were seriously injured. In fact, in aging from 14 to 28 days under such conditions with a mean temperature of 27.1 deg. F., there appeared to be a loss of about 30 per cent. in compressive strength, and one of three concrete cylinders was so weak at the end of 28 days that its strength was only about 45 per cent. of that of a cylinder tested after 14 days.

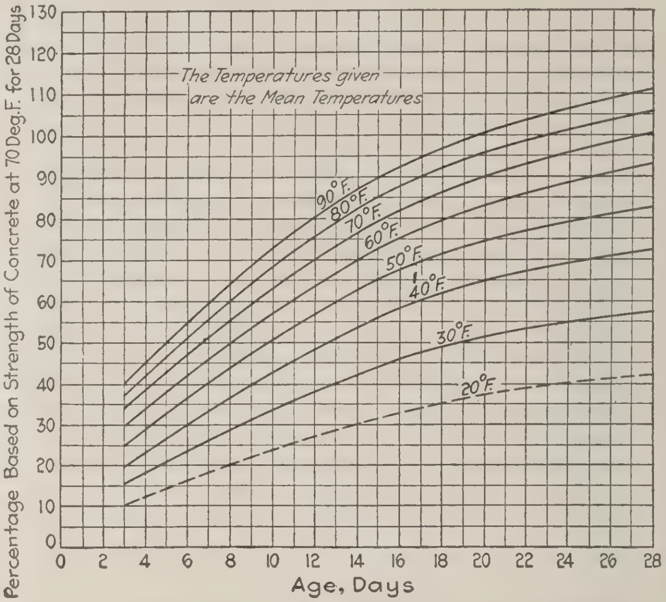


FIG. 2. PERCENTAGES OF STRENGTH FOR DIFFERENT TEMPERATURES

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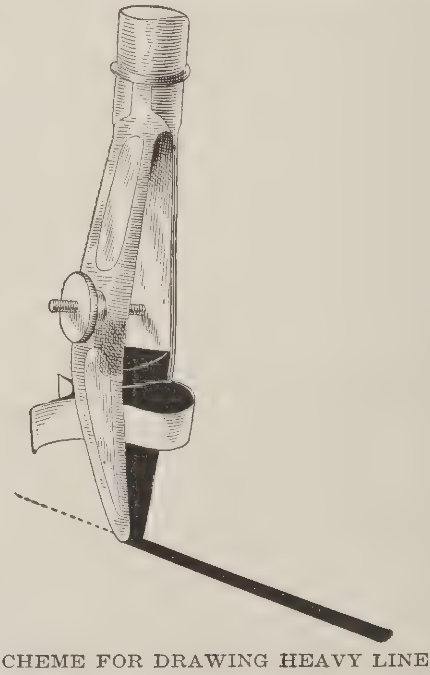
A Pen Kink for Draftsmen

It is often necessary in drafting to draw heavy lines. By placing a bent piece of drawing paper between the blades of a tracing pen, as shown in the illustration, the capillarity of the pen and the flowing friction of the ink can be increased, very heavy lines can be drawn, and the annoying blot at the end of a line can be avoided. The pen will also under these conditions convey more ink.—*Engineering and Mining Journal.*



SCHEME FOR DRAWING HEAVY LINES

New Safety Signal Indicator

A safety device to guard against an engineer's moving a cage until he has received signals from both the top and the bottom of a shaft has recently been invented by Bernard Reilly, a hoisting engineer of near Wilkes-Barre.

The first device along this line was patented by Mr. Reilly about seven years ago, at which time one was placed on an engine at the No. 3 shaft of the South Wilkes-Barre Colliery of the Lehigh & Wilkes-Barre Coal Co. It has been in constant operation since that time, and in the seven years there has not been an accident in the shaft caused by moving the cage without the proper signals.

Under the present system of signaling, an engineer does not move his engines until he receives a signal to do so from both the top and the bottom of the shaft. He is under a constant strain listening for the signals, and if both are rung at the same time he is left in doubt and must wait until they are repeated. Should he be deceived and move the cage thinking that both signals had been given when really only one had been given, an accident might readily result.

The Reilly indicator removes all this doubt by its positive operation. It is worked from the drum or engine, to which it is attached, and when the cage reaches the top a red disk appears, a bell rings and two indicator hands go to the top of the dial. These hands represent bells at the top and bottom of the shaft, and remain pointing to the red danger disk until the bells are rung.

One hand is operated by the bell at the bottom of the shaft, and when this signal is rung the hand drops to the safety position, but the other hand and the disk remain indicating danger until the second bell is rung, when the hand drops and the disk shows white. Thus the engineer can see at a glance whether one or both signals have been given.

Winter Meeting of Kentucky Mining Institute

The Kentucky Mining Institute will hold its winter meeting Dec. 3 and 4, 1915, at Lexington, Ky. On Friday afternoon at 2 o'clock in the Mining Building of the College of Mines and Metallurgy, State University of Kentucky, the following papers will be presented: "New Workmen's Compensation Bill," by K. U. Meguire, president of the Harlan Coal Mining Co., Coxton, Ky.; "Safety Plans in Kentucky Mines" (author unknown at present); "Experience with Fires in Mine No. 4 of the Stearns Coal and Lumber Co., Stearns, Ky.," by Joseph Cain, mine superintendent of the Stearns Coal and Lumber Co.; and "Systems of Coal Mining in Eastern Kentucky," by Prof. C. J. Norwood, dean of the College of Mines and Metallurgy, State University of Kentucky.

In the evening at 6:30 there will be a banquet in the main dining room of the Phœnix Hotel, to which the ladies are invited. Moving pictures of the Hazard coal field will be shown during the evening. On Saturday morning at 9 o'clock an automobile trip will be taken through the Blue Grass country of Kentucky. In the afternoon at 2 o'clock in the Mining Building the following papers will be read: "The Coals of Eastern Kentucky," by Frank Haas, of the Consolidation Coal Co., Fairmont, W. Va.; "The Future of Coal-Mining Plants from an Engineer's Standpoint," by O. G. Peterson, president of the Associated Engineering Co., Somerset, Ky.; "The Ohio Situation" (author unknown at present); and "Cost Accounting" (author unknown at present). On Saturday evening at 8:15 the members will attend the musical comedy, "When Dreams Come True."

The Price-Cutting War at Down East Points

There is no reason to suppose the price war for 1916 contracts on cars Boston has in any way subsided. Consumers who have not closed find themselves in favorable position to negotiate, and the opinion seems to be that the end is not yet. Within a week $3.30 has been quoted, so that prices have softened 30c. since the "campaign" began. Further instances have come to light where fair-sized contracts at points away from Mystic Wharf but accessible to steamers have been closed at 15@20c. less than for the current year. Certainly a larger tonnage has been sold for a farther period in advance than has been the case before. One result of the low prices for next year is a natural tendency of consumers to stock up rather less heavily this winter and rely on getting the full benefit of low prices to be effective Apr. 1. Should there be a marked shortage of steam coals at that time there would be some interesting developments.

Susquehanna Safety Button

The accompanying illustration shows the enameled button of the safety organization of the Susquehanna Coal Co. and the Lytle Coal Co. The reproduction is the exact size of the original. All letters and outlines are in gold. The outer belt is black, the next green and the horizontal space and inner circle white. The central cross is red. This button is given to members of the office and field forces interested in safety, rescue and first-aid work.

Telling Time with a Compass

It is commonly known that points of the compass can be determined by the use of a watch. By pointing the hour hand toward the sun, a bearing halfway between the hour hand and 12 o'clock on the watch is true south.

It is not generally known that time can be told by the compass with equal facility. Take the true azimuth or bearing of the sun and subtract from it 180 deg.; multiply the remainder by the fraction $^1/_{15}$, and the result will be the hours before or after 12 o'clock noon.—*Engineering and Mining Journal.*

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Damages Recoverable for Personal Injury—For injury to a coal miner, caused by a gas explosion for which his employers were liable, where his sight and hearing were permanently impaired, $3,000 is not excessive recovery. (Kansas Supreme Court, Hartman vs. Dickinson, 148 Pacific Reporter, 743.)

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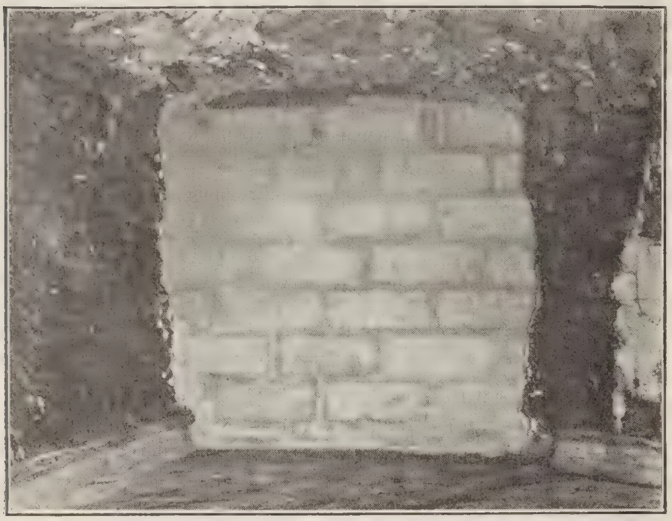
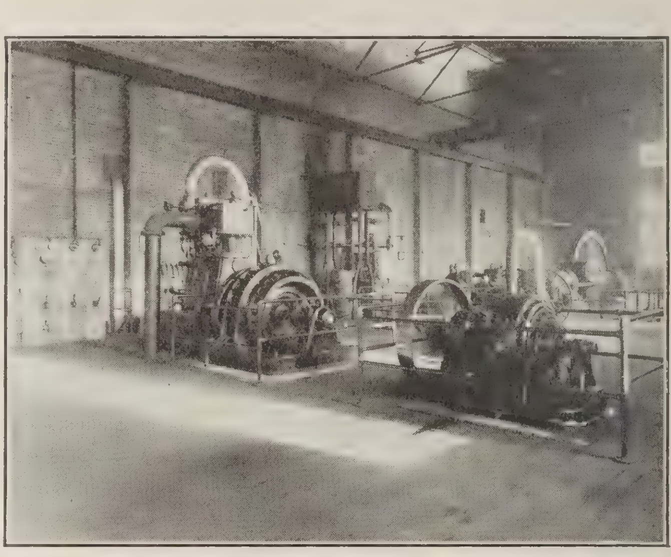
Relation of Fireboss to Operator in Pennsylvania—So far as a fireboss discharges his statutory duties he acts as a state official and not as a representative of the operator. Hence, assurances of safety given by him to a miner are not binding upon the operator. But he may become the representative of the operator by performing duties beyond those required of him in an official capacity. (United States Circuit Court of Appeals, Second Circuit, Calausky vs. Lehigh Valley Coal Co., 222 Federal Reporter, 664.)

Snap Shots in Coal Mining

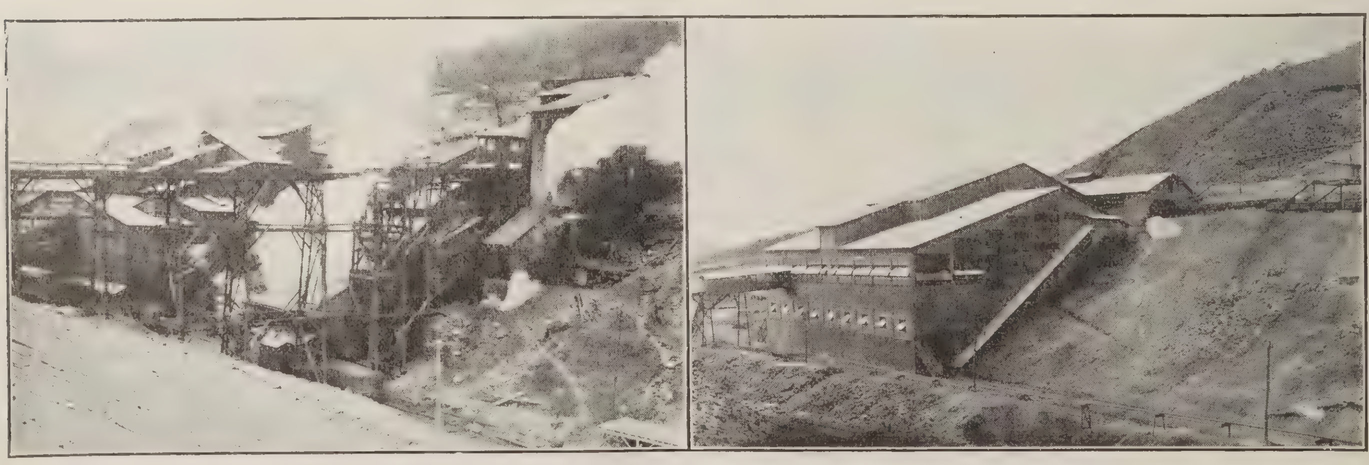


A PYROBAR (GYPSUM BLOCK) STOPPING IN NO. 8 MINE OF THE MADISON COAL CORPORATION IN ILLINOIS



INTERIOR OF ENGINE ROOM AT LETHBRIDGE COLLIERY, LETHBRIDGE, ALTA., CANADA

PITTSBURG COAL CO.'S FUEL LIGHTER "PITTSBURG," DISCHARGING COAL INTO THE BUNKERS OF A LAKE FREIGHTER



HANDLING STEAM, SMOKE AND DUST IN THE ANTHRACITE FIELD

The old way

The new way

The Labor Situation

SYNOPSIS—The railroads decide that the poverty of the Ohio miners alone appeals to them and propose to raise ton-mile rates in Pennsylvania, where they are high, as much as in West Virginia, where they are low. More button strikes in the anthracite region. In Ohio the court resentences strikers for violating injunction.

Most of the Ohio coal miners are now back at work, and it is stated on good authority that not more than 5,000 out of the 40,000 miners in Ohio coal fields are now idle. Governor Willis has made a careful inquiry to determine if there is any probability that this year's calamitous stagnation will be repeated in the coming year.

According to reports made to him, the only large body of miners now idle are those who were formerly employed by the Sunday Creek Coal Co. in the Hocking Valley district, and these amount to about 4,000 men. Operators in general believe that the demands for coal from the big steel mills and plants that are making war munitions will prevent any depression in the coal business this winter.

The New York Coal Freight-Rate Conference

But while the war may bring temporary relief, there is need for some permanent improvement, which it is hoped will make operation always profitable and not dependent on abnormal conditions. This steady relief is expected from lowered freight rates.

It is stated that at a meeting of the traffic officials of coal-carrying roads in New York City it was decided to increase the rate on shipments of coal 15c. a ton when shipped from near-by states to points in Ohio, eastern Indiana and eastern Michigan. It is said that the new tariffs will be filed with the Interstate Commerce Commission at an early date. The filing of the tariffs is expected to start a bitter fight by operators in West Virginia and Kentucky against the establishment of the advanced rates.

At the New York meeting the following roads were represented by their presidents or vice-presidents: The Pennsylvania R.R., the Chesapeake & Ohio Ry., the Baltimore & Ohio R.R., the Norfolk and Western Ry., the Louisville & Nashville R.R., New York Central & Hudson River R.R. and the Pennsylvania Lines West of Pittsburgh. Banking interests which exercise a strong influence in some of those systems were also represented and the session had its strenuous moments.

Pittsburgh Freight Rates West to Be Increased

It seems that of the lines serving the West Virginia fields the Chesapeake & Ohio Ry. held out most vigorously against the proposed increase, in which the other lines had recently acquiesced. But President George W. Stevens finally yielded only on the condition that the Pennsylvania R.R. also increase its rates from the Pittsburgh district, a concession which the latter road is said to have made most reluctantly.

The men who participated in the conference explain that the advance is made to prevent the rates from coal mines in Ohio to consuming points in the state being lowered the same amount (15c. per ton) as the railroads now propose to raise them on coal from West Virginia.

Until the meeting it had not been intended to raise the rates on coal from Pennsylvania mines, but the maintenance of the old rate while the West Virginia rate was changed would have given Pennsylvania an advantage over West Virginia and Kentucky. Consequently as explained, the Chesapeake & Ohio Ry. refused to acquiesce in the increase unless the Pennsylvania R.R. also agreed to lay a freight burden on the Pittsburgh coal. This feature of the situation caused much friction among the carriers, which heretofore have worked in harmony in the treatment of coal rates.

As indicated, the Chesapeake & Ohio Ry. in particular objected to the proposed advance as affecting the mines on its lines and at previous conferences with other roads declined to join in the plan. The rates from West Virginia and Kentucky to Ohio points are now 25c. higher than from Ohio mines to the same destinations, and it is now proposed to make them 40c. higher, so as to enable Ohio producers to do more business in their home state.

To preserve the graduation of rates, Indiana and Michigan destinations near the Ohio state line would have to be advanced, so that a horizontal increase of 15c. a ton will be placed on practically all coal moving from Pennsylvania, West Virginia and Kentucky mines to consuming points in Ohio, eastern Indiana, eastern Michigan, and possibly the Province of Ontario.

Railroads Attacked for Restraint of Trade

The producers in West Virginia and Kentucky are already organizing to fight the advance and have asked the support of their senators and congressmen in an investigation, which will bring up the question of the reasonableness of the advanced rate, the interest in coal lands held by the carriers making that rate, the control of said carriers by other lines serving competitive coal territory and the restraint of trade in West Virginia and Kentucky to promote coal production in Ohio.

The Interstate Commerce Commission can deal with the first three questions, but is not charged with the enforcement of the Sherman act, and the fourth question may come up in Congress shortly after it convenes next month, should the carriers file the advanced tariffs, as is now anticipated.

The points that will be considered by the Interstate Commerce Commission when the new tariffs are filed can be summarized as follows:

1. The right of the State of Ohio to force by statute the production of Ohio coal at excessive labor cost and the proposition to equalize this handicap by reducing the charge for transporting it to an Ohio market.
2. The right of the carriers in West Virginia, Virginia and Kentucky to restrain trade on their lines in those states by adding 15c. to the coal rates into Ohio, so as to relieve the Ohio carriers from a reduction of that amount. The West Virginia and Kentucky operators claim that this is "unionizing their mines by proxy," and the controversy between these two competing fields has waged largely over this special point.
3. The right of carriers in West Virginia and Virginia to control coal lands through the ownership of stock in corporations owning coal properties, said carriers being subject to the act to regulate commerce, but maintaining subsidiary holding corporations which are not.
4. The right of coal carriers in the State of Pennsylvania to control rates from competing mines in West Virginia, Virginia and Kentucky through the ownership of stock in the carriers serving those fields.

Frequent Strikes in the Panther Creek Valley

There has been some trouble at the mines of the Lehigh Coal and Navigation Co., where a retrenchment policy has been put in force. Several men who were engaged in dead work were laid off either for a few days or indefinitely, and it was noted that the newer men were retained in some instances and the older hands laid off. It was also declared that the discrimination appeared to be exercised against leading union men, and 2,600 men at Nesquehoning No. 10 and Spring Tunnel collieries went on strike Nov. 17.

At the same time the 3,100 employees at collieries Nos. 4, 5, 6 and 11 who struck in the previous week returned to work without any concessions. This strike arose because some of the men went to work without their union buttons. The electricians appear to have been leaders in the disaffection, their grievance being that several of them had been suspended.

Judge Dayton's Injunction Again in the Courts

Judge Alston G. Dayton, of the United States court, has pronounced new sentences at Philippi against four labor organizers who were convicted last spring of violating Judge Dayton's injunction prohibiting strike organizers or their sympathizers from interfering with the operation of coal companies at Wellsburg, W. Va., during a strike which was then taking place.

The persons, when sentenced before, entered immediately on their terms of imprisonment. They were released later on bond to ask for an appeal, but this appeal was denied them. They were sentenced on Nov. 16 for the balance of the time yet to be served. Fannie Sellers, Pittsburgh, Penn., James Oates, Charleroi, Penn., and Fred Ledvinka were each sentenced to serve three months and 15 days; Hiram Stephens, Wellsburg, W. Va., received two months and one day. A writ of error has been issued for Fannie Sellers and she has furnished bond to appear at the next term of the United States district court.

Editorials

Perversities of Human Nature

The workmen's compensation bill is revealing some of the worst sides of the more undesirable of us. Sometimes it seems as if it would be better for the industry to hide the crooked tricks of some of those who would take advantage of the compensation acts. For we need to keep firm hold on the sheet anchor of our belief that the average workingman is a sterling good fellow and ill-disposed to take advantage of anyone. Only by confidence can we inspire confidence.

As an illustration of an unfair attempt to take advantage of the law a case in the Bell County Circuit Court of Kentucky may be instanced. Godfrey Jackson worked for the Elk Coal Co., and after he had left its employ for a year he committed suicide. His family brought suit, saying that the bad air in the mines had so affected him that in a moment of depression he had laid violent hands on himself. Of course the court gave a verdict for the defendant company.

But after all is not this suit, unjust as it was to the Elk Coal Co., really only a natural outcome of the compensation act? Here is probably a widow—the report does not state specifically that it was a widow—deprived of her source of livelihood and needing compensation. She naturally and rightly reasoned that she needed it as much as if her husband had been killed by a shot in the mines or a fall of roof.

But the Kentucky laws say that the accident of death determines the whole matter. If a cancerous growth is the cause, there is no recovery, even though that disease is common enough. But if a roof fall is the cause, the widow must be compensated even though the mines of Kentucky are so safe as hardly to modify in any degree the duration of life. In fact they may even extend its span, so free are they all from accident and so conducive to health are so many of them.

Why is an occupational disease or accident singled out for consideration? Are we not all in Uncle Sam's big dwelling, and if he fails to take care of us or we fail to take care of ourselves or if we are unable to protect our own lives, surely in any event Uncle Sam is just every bit as liable for a compensation as the coal operator? The widow is just as much a widow whether the so-called horrid mine or the so-termed pleasant village street is the scene of the demise. That is why workmen's compensation leads inevitably to state insurance.

These are facts. Though there has been poetry written about beautiful trees and happy homes and little or none about the works or the mines, nevertheless it is not any more pleasant for the widow to have her husband killed by a thunderbolt under the spreading chestnut tree or to have him strung up by the neck to the roof beams of the home till he is dead than to have him crushed by a roof fall in the mines or by a crane in the factory. A lot of thoughtless nonsense, written about the mines and the factory, has caused us, however, to take a different view.

Cases there will always be in which companies are victimized; in fact, to have to pay any compensation at all where a man is himself to blame is unfair. Still there is a larger measure of justice than of injustice in compensation, and we must keep our minds firmly set on its brighter aspects, endeavoring always to lead the public and the employee to a clear apprehension of what is right and best for all concerned.

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Why Different Grades of Coal Fluctuate Independently

There is always a tendency to believe that all the grades of a product should fluctuate in price proportionately, for the cost of production of all sizes usually advances and falls in a given proportion and that fact, it is argued, should make the mutations in selling price uniform. Unfortunately demand is at least as important as supply, and some people do not want any one product so badly that they can be trusted not to purchase a substitute. So as the traffic in the one product will not permit of a higher price, the schedule cannot be changed for that item, and all the advance in production cost must be charged against the business which refuses a substitute.

"What the traffic will bear" is frequently a correct basis for charges, often as that has been denied. It discourages the manufacture of products not desired, and where their production is unfortunately inevitable, it provides an outlet for them which prevents their being wholly wasted. These are the eternal laws of trade not peculiar to this time nor to the coal business nor to this country, though they have a peculiar pertinency when changes are likely to take place in the production cost of an article like anthracite coal.

The demand for anthracite in the larger sizes is still almost without a rival, whereas in the lower sizes only past use and the type of boiler-furnace grates already installed prevent many users of anthracite coal from deciding to make a change in fuel. Such customers once lost might not be regained even if the price of the anthracite fuel were much reduced. Many a manufacturer hesitates to change to a soft fuel and face the possibility of conflict with the smoke ordinance officers. Once the trick is turned he will feel a confidence that will make it difficult for the hard-coal salesman thereafter to reconvert him to the use of an anthracite fuel.

It has been said that the poor are the biggest purchasers of large coal and the rich manufacturers buy the smaller grades and that if any distinction is made the rich man should suffer, not his poorer fellow. But the costs of fuel are ultimately always added to the manufacturer's selling price, and any marked increase in the price of small sizes would unquestionably be reflected in higher prices to the workman for manufactured articles.

So it is a condition not a theory which confronts us. If the operator can only sell to the manufacturer by keeping his price down, then he must keep that price at the low level or not sell at all. If he fails to market any of his smaller coal, then the consumer of the preferred sizes must pay for all that is thrown away as if it were so much rock. That is an economic necessity, and it is better that the discriminations which exist in any mixed product should continue. Who pays for straw as if it were grain or for bran as if it were flour? They are all products of one and the same field, but they cannot bear the same price per unit weight or measure. Stable litter must rise or fall in price with the bedding market, and chicken feed will not rise and fall concurrently with the material for making fine bread.

Anthracite Operators' Burdens

In the coming spring there will be an attempt made to put a most unreasonable burden on the anthracite operator—a burden which he can hardly hope to transfer to the back of the consumer who should carry it. The public is not a keen observer of first causes and tends always to lay the blame for increased prices on the operator who pays the bills and not on the parties who receive the money. So it is well to point out just where the necessity will arise for an increased rate for coal at the mines, and to label the burden so that the public will know just who it was demanded that it should be carried.

And burdens are burdens, be they just or unjust. The operators have on Jan. 1 to face the cost of compensation. Hitherto there has been practically none obtainable. The miners have worked under foremen certificated by the state, and therefore the courts have decided that the foremen and not the operators have been to blame when an accident occurred. This has all changed. The operator must shoulder the whole burden and rightly so, but because the load is rightly laid on the shoulders of the operator, and even with his good will and assistance, is no reason why it is not burdensome to him nor any reason why the consumer of the product should not accept the load as his own. For it is for the benefit of the consumer that the coal is dug, and the toll of the industry should be paid cheerfully by those whom the industry benefits.

Another item of increased cost is that of taxation. The taxes, including the 2½-per cent. valuation tax, which is, it is true, of doubtful validity now the Roney bill is declared null and void, have increased 150 per cent. since 1910, and concurrently the assessed valuations have increased and even in some cases doubled. This is a burden constantly increasing, but of course not wholly one which will be new in the coming year.

The demands of the union will of course form the biggest item. It is almost impossible to believe that they will be granted. They amount to nearly 67c. per ton of an increase on the domestic sizes. With the cost of compensation, the increase may have to be 75c. per ton.

So the question is pertinent, Will the consumer willingly pay it? If he will, no one will be better pleased than the operator. Higher wages for his men, shorter hours, compensation, liberal payments to the state for roads and hospitals are all pleasing to him if the consumer is willing. The fight is made by the operator, not because he does not want the miner, the day laborer and the state to benefit, but because he doubts whether the consumer is willing to pay for the costs which too often he is ready enough to require. In short, the complacent public is willing enough to give its orders to the waiter, but it is singularly quiet when it becomes time to settle the score. Cheerful it always is in ordering the best on the bill—taxes, compensations, shorter hours, better pay—but it scans with a suspicious eye the lengthy items on the score when the time arrives at which to make payment, quite forgetting the prodigal menu it has ordered and enjoyed.

Pennsylvania Coal and the Last Navy Contracts

The statement in the latest report of the paymaster-general of the navy that the department saved from 20 to 25c. per ton on fuel last year is so unusual that it is attracting notice outside the coal industry. While 1914-15 was a dull season, that of itself would not account for so significant a margin. The answer is that for the first time, in June, 1914, coal mined in Pennsylvania was recognized as strongly competing for an order which had come to be regarded as peculiarly a perquisite of coals loaded at Norfolk and Newport News. Not only were Pocahontas and New River favored, but no other coals, Big Vein Georges Creek alone excepted, were considered on anything like a parallel basis. Armored boats with their high-speed requirements seemed absolutely dependent on West Virginia steam coals of the highest grade; and further, it was the opinion that only at Hampton Roads and Curtis Bay could naval colliers load safely and get suitable dispatch. That was the general impression of naval men, and that as it proved was the general expectation of the Southern agencies when bids were submitted in June, 1914.

Thirteen of the 19 Hampton Roads shippers who bid (practically all Pocahontas and New River operations were represented) submitted $2.90 f.o.b., the six other proposals ranging from $2.88 to $2.80, the latter being the lowest Hampton Roads price named. This was when $2.65 was a high price for spot coal and the market was as near demoralization as at any time since 1909. Of course the bids were for the year ending June 30, 1915, but it must have been with some sense of relief that the authorities turned to Pennsylvania tenders ranging from $2.42 to $2.70 f.o.b. Philadelphia. An award of 200,000 tons at $2.65 was made on a B-vein Cambria County coal that had been thoroughly tested in ships of differing types, and so far as is known the coal proved satisfactory throughout the year. On the 200,000 tons, at least, there was a nominal saving of 35c. per ton as compared with most of the Pocahontas and New River submitted at the same time, and he would be a hard critic who would say there was that difference in efficiency. And it was conclusively shown that the largest colliers could be given adequate dispatch at Philadelphia.

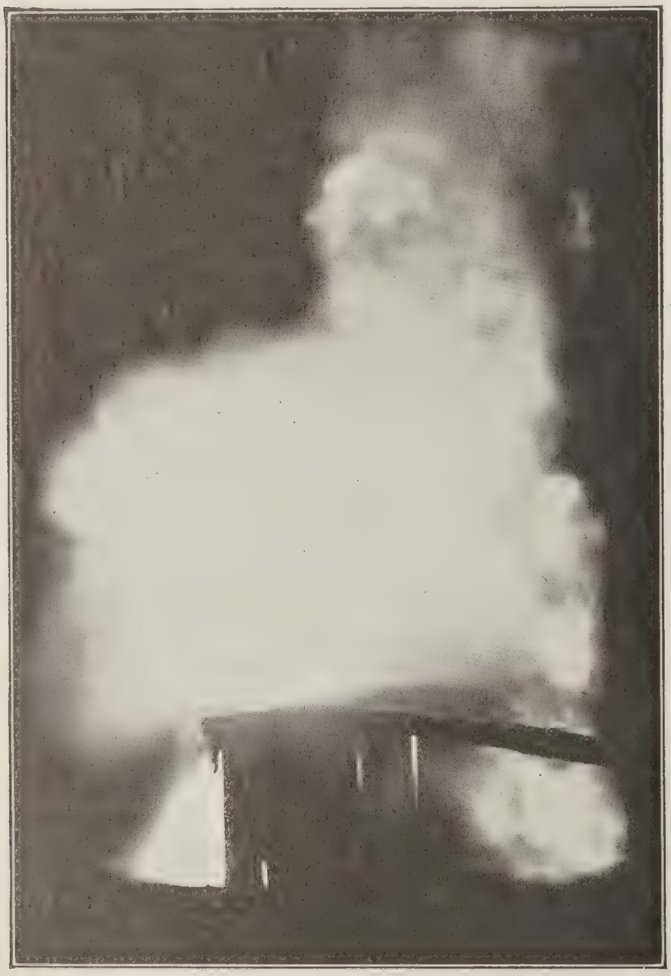
Moreover, a year later, with Hampton Roads coals fairly firm at $2.75 to $2.85, the same contract, this time for 400,000 tons, was placed on Pocahontas coal at $2.60, or 5c. less than the department paid for Pennsylvania coal in 1914. This not only reflected a determination on the part of West Virginia operators to stay in competition, but as emphasized again in September in the case of the Panama R.R. (see contract No. 1327, Vol. 8, pp. 367, 446, 532), it made plain that the Government's former dependence on Hampton Roads was now a matter of price.

Sociological Department

Indiana State First-Aid Meet

SYNOPSIS—The union and operators in Indiana combined to make the first-aid meet at Bicknell a success. The spectacular explosions, inexpensively arranged, exhibited more forcibly than ever the dangers of coal dust. Only full-team events were contested. A team of boys, the Bureau of Mines instructors and the Kiltie band received special honors.

Marking a rare occasion in the history of the coal industry in which operators and miners worked together in a cause of mutual benefit, Indiana's State-Wide First-Aid Meet held at Bicknell, Saturday, Oct. 30, set a mark that will be difficult for other cities of the Hoosier State to surpass when holding future meets. Interest throughout the coal fields of Indiana was at its maximum, and Bicknell was crowded throughout the day with the throngs of visitors.



EXPLOSION OF COAL DUST AT NIGHT IN TEST GALLERY ERECTED AT BICKNELL

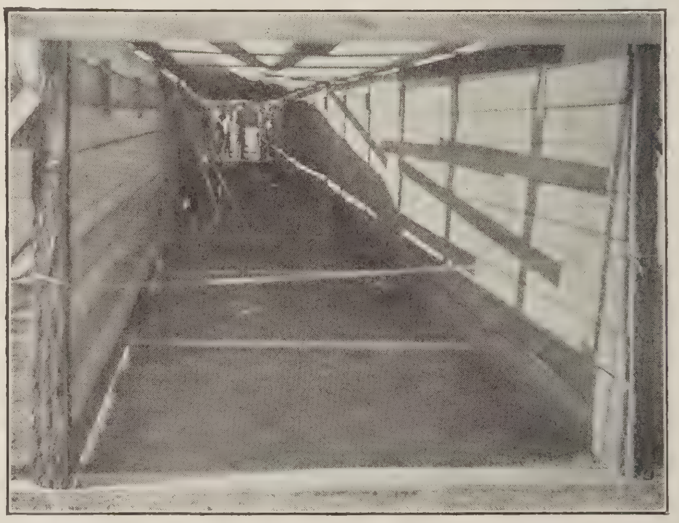
Bicknell celebrated the meet by declaring Saturday a holiday for the little city. The citizens did everything in their power to make the stay of the visitors as pleasurable and profitable as possible. At 10 a.m. the program opened with the state-championship soccer-football game between Dugger and Bicknell, the latter team winning 2 to 0. Others took an automobile tour of the mining properties around Bicknell. The new plant of the American Mining Co., which began operations in April, attracted much attention. The principal owners of this $1,500,000 enterprise are the Zellars and McClellans, and it is stated that the property can be made to produce 4,000 tons of coal for every working day of the year for a period of 25 to 30 yr. The construction and equipment of this plant are said to be the "last word" in mine engineering.

In the same field and a few miles west of Bicknell is Bruceville, which also was visited. The Oliphant-Wasson company, composed principally of Vincennes capitalists, is erecting another plant which it is said will be as modern as the American. The Indian Creek Coal Co. has a large plant near the American, but is an older concern. This company also owns several thousand acres of coal lands and has an immense output. Not long ago it broke all Indiana records for a day's work by loading 3,500 cars of coal in a working day. In addition to these mines, the trip included visits to the Knox, the Bicknell and the Tecumseh coal companies' properties. Reports of the Indiana state geologist state that Knox County has a larger acreage of mineable coal than any other in the state.

During these entertainments the first-aid teams reported at the Commercial Hotel, the headquarters of the meet, and at 1:15 p.m., the lengthy parade, headed by the Kiltie Bagpipers, was formed. The procession was made up of first-aid teams and visitors, all occupying automobiles lent by the Bicknell citizens. The J. K. Dering band, of the J. K. Dering Coal Co., of Clinton, also furnished music.

CONVINCING EXHIBITS OF COAL-DUST DANGERS

Arriving at the field the first event of interest was a coal-dust explosion demonstration under the direction of the Bureau of Mines. The first demonstration was fired by Job Freeman, president of the Glen Ayr Coal Co., of Terre Haute. The gallery being built only for use during the demonstration was constructed of a light framework of brattice boards covered with a roof of brattice cloth. The cannon was made under Dr. August F. Knoefel's orders. He is in charge of the first-aid department of the Indiana Bituminous Coal Operators' Association. The lining of the cannon consisted of a 7-in. steel shaft 48 in. long. A hole was bored in it 1¾ in. in diameter and 22 in. long.



INTERIOR OF GALLERY; WALLS ARE OF BOARDS AND ROOF OF BRATTICE CLOTH

This lining was placed in a 10-in. pipe and the space filled with a half-and-half mixture of concrete. Each shot was stemmed with clay well tamped. After being mounted on a platform it was loaded with 1 lb. of black powder, and 5 lb. of coal dust was scattered for a distance of 10 ft. Flames extended for more than 50 ft. along the gallery and part of the brattice-cloth top was torn loose by the force of the explosion. This small demonstration well illustrated what "bug dust" may do if drawn into the flame of a blownout shot.

Considering that the "room" was thoroughly sprinkled with water within 10 ft. of the "face," the men from the Bureau of Mines considered that the exhibit was unusually valuable as a demonstration of the possibilities of causing an explosion by the use of ordinary blasting powder.

In the second demonstration a permissible explosive was loaded into the cannon and tamped with clay. In addition to the coal dust scattered in front of the cannon, shelves were placed in the gallery 5 ft. apart. These were attached to the cannon by a wire so that the recoil would pull the shelves down, scattering the dust throughout the gallery. There was no explosion nor any flame following this demonstration, and the only effect of the discharge was a stirring up of the dust, as the shelves, by which it was supported, collapsed.

FIRST-AID TEAMS AWAITING THE INSPECTION OF THE JUDGES

A MORE VIOLENT EXPLOSION AFTER DARK

At 5 p.m. a third explosion bigger than any which preceded it was staged. On a platform 12 ft. long, 8 lb. of coal dust was scattered in front of the cannon, which was loaded with black powder instead of permissible explosive. On its discharge by William Diamond, international statistician of the United Mine Workers of America, of Indianapolis, the gallery became filled with flame, and portions of it were burned and torn loose by the force of the explosion.

The first-aid contest started at 2 p.m. There were 27 entries, but of this number only 22 presented themselves upon the field. Harry Snyder, of Brazil, acted as announcer and read the problems selected by the judges. Dr. A. F. Knoefel acted as chief judge and was assisted by Drs. M. R. Coombs, R. L. Woodward, C. N. Coombs, J. H. Weinstein, F. H. Carmichael, J. T. Freed, A. M. Mitchell, W. F. Willien, O. O. Alexander and Rudolph Duenweg. From a list of nine problems the judges selected the following five for the contest:

A driver falls under a car, sustaining a compound fracture of the right forearm 4 in. above the wrist, causing slight bleeding, and also a severe laceration over the right kneecap with practically no bleeding. Treat.

A fall of slate on an entry causes a trolley wire to fall on the back of the right shoulder of a motorman, severely burning him and rendering him unconscious. Dress and treat for electrical shock. Transport 50 ft. on an improvised stretcher.

A fireboss in making his rounds runs into an unexpected pocket of gas which is set off by the naked lamp that he is wearing. He sustains burns of his entire body above the waist line without losing consciousness. Treat.

A trip-rider is knocked off his motor and run over by an empty car. He sustains a compound fracture of the thigh 4 in. above the left knee, which causes a severe hemorrhage. In addition he has a simple fracture in the middle of the right leg, but still retains consciousness. Treat.

A cager is caught between the cage and the brow timbers. His right ear is severely lacerated, and the sixth, seventh, and eighth ribs on the right side of the chest are fractured. A laceration of the abdominal wall just above the left hip also demands attention. Treat.

REGULATIONS GOVERNING CONDUCT OF MEET

The systematic manner in which the meet was conducted was due largely to the rules set down for the contests, especially in reference to rule No. 24, in which the judges are instructed what to discount for the application of a dressing to the wrong limb or wrong side of the body. In every contest some team dresses the wrong limb, and judges use their own discretion as to the amount of penalty to be imposed. By having a set discount, this uncertainty was avoided.

The following discounts, as adopted by the American Mine Safety Association, were made of force in this meet:

Not doing the most important thing first,	6
Failure of captain to command properly,	1
Slowness in work and lack of attention,	2
Failure to entirely cover the wound or being unable to give location of injury,	4
Ineffective artificial respiration,	11
Splints improperly padded or applied,	6
Tight, loose or improperly applied bandage,	5
Insecure or granny knot,	4
Unclean first-aid material,	3
Failure to have on hand sufficient and proper material to complete a dressing,	3
Lack of neatness,	2
Awkward handling of patient,	4
Assistance afforded by patient,	3
Tourniquet improperly applied,	7
Failure to stop bleeding,	8
Not treating shock,	5
Failure to be aseptic,	7
Improper treatment,	12
Omitting to control hemorrhage before applying tourniquet,	7
	100

SOME OF THE SUPPLEMENTARY RULES

The following supplemental rules governing the meet are of interest:

All problems will definitely locate the injury or injuries. All events offered will be team events. In problems requiring the carrying of the patient on a stretcher a designated number of feet, this can be accomplished by carrying the patient half the required distance from the working place, the other half to be covered by returning the patient to the original position. It will only be necessary to treat for active bleeding where the problems state "active hemorrhage," "bright red blood," "bleeding," "profuse bleeding," or similar terms. The Schaefer method will be the approved plan of promoting artificial respiration unless the injury precludes its use. All events will start at the sound of a gong or horn. It is suggested that each team be provided with two pieces of canvas, one to place under the patient and the other upon which the dressings may be laid. The winners will not be announced until at the evening program, when the prizes will be distributed.

BOY TEAM A NEW FEATURE IN MIDDLE WEST

The field selected for the contests proved to be ideal and was thronged with more than 3,000 people. Frequently the crowd gathered in so close around the teams that it was necessary to stop the meet until the people were driven back. They gathered in particular around the Powellettes, a team of boys who had been trained by Foreman G. T. Powell, of Mine Rescue car No. 3. It was composed of Captain Walter Clark, 15 yr. old; John Robertson, 16 yr.; Robert Jones, 16 yr.; Ralph Foster, 15 yr.; Sam Wilson, 16 yr.; and patient, 14 yr. The youngsters carried off the nineteenth prize and a special award

FOREMAN G. T. POWELL AND HIS CLEVER TEAM OF POWELLETTES of six pocketknives for the team with the youngest members. It is hoped that next year more Powellettes will be in line.

Following the fifth problem for teams, the final coal-dust explosion was demonstrated, and the recorders in figuring out the percentages found that seven teams were tied for places, which were worked off after the explosion, keeping the teams on the field until after dark. Meanwhile the evening's program was started in the business center of town, where motion pictures of the anthracite fields of Pennsylvania and the zinc mines in New Jersey were shown. These pictures, obtained from the Bureau of Mines, attracted hundreds of people to the streets, all gathering around the screen, which was hung from the side of one of the buildings. These were again thrown on the screen after the conclusion of the evening program.

UNION AND OPERATORS CO-OPERATED IN MEET

At 7:30 p.m. the hall in which the prizes were awarded was opened, and in a short time it was packed, even the standing room being fully occupied. Dr. Knoefel, who had charge of the meet and was chief judge in the contests and is a representative of the first-aid department of the Indiana Bituminous Coal Operators' Association, and of the American Red Cross, and also an ex-president of the American Mine Safety Association, opened the meeting by introducing Mayor Tyler Lawton, who expressed the appreciation of the little city for the number of visitors attending the meet, after which he acted as the presiding officer, introducing all the speakers. They dwelt upon the fact that the operators and miners, together with Bicknell business men, worked in complete harmony in preparing for the meet. Representatives of both the operators and miners spoke on this feature, declaring it to be a signal success for both.

OLIPHANT-WASSON CO., WINNERS OF FIRST PRIZE

Left to right—Standing: Robert B. Logan, Dan E. Ellis and Glen Oliphant. Sitting: Paul Thompson, Ed. Livingston, Captain; John Mosby

The speakers were William Diamond, international statistician of the United Mine Workers, Indianapolis; Edgar A. Perkins, chairman of the Industrial Board of Indiana, Indianapolis; D. Harrington, mining engineer of the Bureau of Mines, Pittsburgh; William Kitch, secretary of district 11, United Mine Workers of America, Terre Haute; John C. Wright, deputy mine inspector of Indiana, Boonville; Robert J. Smith, president of the Deep Vein Coal Co., representing the Indiana Bituminous Coal Operators' Association, Terre Haute; and Dr. A. F. Knoefel.

Dr. Knoefel then awarded the prizes. Instead of starting with the first prize, he presented the low award first, so that the interest instead of declining increased. The winner of the state championship was team No. 2, of the Oliphant-Wasson Coal Co., of Boonville, headed by Captain Edward Livingston. The team received the state championship cup donated by the Indiana Coal Operators' Reciprocal Organization, of Terre Haute, six bronze medals from the American Red Cross, six bronze medals from the National Safety Council and six bronze medals from the meet committee. All teams competing received medals announcing their participation in the contest.

CHAMPIONS HAD ONLY A WEEK'S PRACTICE

The championship team did not begin work for the meet until the Monday preceding the day on which the meet was held. On that night they took their first lesson under Dr. Knoefel and were trained by him in the few days intervening. None of them had ever taken part in first-aid meets before or even done any of the work, which makes their victory all the more remarkable. Other prizes awarded were as follows: Special grand prize, the Bicknell loving cup, awarded to the team most proficient in the improvising of dressings and in making use of dressings that were thus improvised—won by team No. 2, of the Tecumseh Coal and Mining Co., of Bicknell, Robert Collins, captain. Second prize, five Red Cross certificates, medals from the meet and one coffee percolator donated by the General Electric Co.—won by the Knox Coal Company, of Bicknell, Andrew Henderson, captain. There were 20 other prizes given, so every team received some form of recognition for its enterprise and efficiency.

The averages of the teams as reported by the recorders were as follows:

Name	Captain	Location	Av.
Oliphant-Wasson No. 2	Ed Livingston	Bruceville	95.0
Knox Coal Co. No. 1	Andrew Henderson	Bicknell	93.8
Green Valley Coal Co.	Homer Baker	Jasonville	93.4
Jackson Hill No. 2	J. H. Needhammer	Sullivan	93.2
Miami Coal Co. No. 1	E. Lapworth	Clinton	92.8
Miami Coal Co. No. 2	John Stevely	Clinton	92.8
Indian Creek No. 1	John Cheyne	Bicknell	92.8
Vandalia Mine No. 15	William Keller	Cass	92.6
American Coal Co. No. 2	Michael New	Bicknell	92.4
J. Wooley Coal Co. No. 2	James McNair	Paxton	92.4
Vandalia Mine No. 82	George Murdock	Terre Haute	92.0
Tecumseh Coal Co. No. 2	Robert Collins	Bicknell	91.8
J. K. Dering Coal Co.	Scott Amour	Clinton	91.6
Vandalia Mine No. 9	Charles Doidge	Linton	91.0
American Coal Co. No. 1	Rollie Cook	Bicknell	90.0
Vandalia Mine No. 10, local	James Edwards	Dugger	89.6
Knox Coal Co. No. 2	Walter Pollock	Bicknell	88.8
J. Wooley Coal Co. No. 1	Robert Lilly	Paxton	88.8
Calora Coal Co.	E. R. Devilin	Jasonville	88.4
Powellettes	Walter Clark	Bicknell	88.2
Richards Lower Vein No. 1	Richard Owens	Terre Haute	86.0
Old Bicknell Mine	Don Hoover	Bicknell	85.2

As the name and the prize of each team were called out and the captains went forward to receive their prizes, the audience called on the successful contestants for speeches, and many were forced to respond. After the regular prizes had been awarded Dr. Knoefel called upon five of the Bureau of Mines men—H. I. Smith, G. T. Powell, W. W. Fleming, James Fleming and J. A. Hanraty—and presented them with five medals made in the form of watch fobs as an expression of appreciation from the Bicknell business men and the operators and miners. Those given Mr. Smith and Mr. Powell were of gold and the others bronze.

Then it was found that there was yet a set of meet medals and Dr. Knoefel called for suggestions from the audience and was urged to "Give 'em to the Kilties!" The call was so unanimous that the Kilties Bagpipers were called to the front amid the cheers of the audience and the medals were pinned upon their Scottish "claes." This brought to a close an unusually successful meet.

Coöperating in holding the meet were the merchants of Bicknell, the American Red Cross, the Bureau of Mines, the National Safety Council, the first-aid department of the Indiana Bituminous Coal Operators' Association and the Indiana mine-inspection department. It was held under the auspices of the Indian Creek, Oliphant-Wasson, American, Knox, Bicknell and Tecumseh coal companies and local unions Nos. 1,634 of Vincennes, 1,368 of Bruceville, 884 of Bicknell, 1,698 of Bicknell and 2,411 of Bicknell. The officers at the head were President John Rodgers, Secretary William Bogle and Treasurer Andrew Henderson, all of Bicknell.

Among those in attendance were Mike Scollard, chief inspector of Indiana, and all his five assistant deputies—J. C. Wright, of Boonville; Edward Church, of Sullivan; William Edwards, of Clinton; Joseph Fennell, of Linton, and Charles Fox, of Terre Haute, who is also president of the Indiana Federation of Labor. Ed. Wallace, editor of the "United Mine Workers' Journal," was also present to report the meet for his publication.

Discussion by Readers

Store Checks vs. Thrift

Letter No. 5—Yes, as *Coal Age* says in its Foreword, Oct. 16, page 619, "We know in our hearts that thrifty men make the best employees, because they buy homes and become settled citizens." In the long run they are the best workmen in the mine. There is not a man who has had any experience with mine labor and whose opinion is worth knowing that would say otherwise.

I fear, however, that few such men will respond to the invitation of *Coal Age* to express their opinions on this subject. Although the general opinion among mining men is unanimous, the matter is little talked about among themselves, since it is well understood that no mining concern that runs a store would tolerate any criticism on the part of an employee. Whatever their private opinions, all mine officials are expected to make their men realize, in some subtle but effective way, that the man who spends most at the company store will receive more favors than the one who buys elsewhere.

Rating Employees by Their Purchases

It is a matter of regret that in some instances mine operators and managers have gone through the list of their employees for the purpose of comparing the purchases made by the different families, in order to arrive at an estimate of the amount of merchandise that they consider each particular family ought to buy, using as a standard of comparison the purchases made by the best customer in the store.

In this estimation no account was taken of the fact that a man has a wasteful wife or housekeeper who purchases 50 or 100 per cent. more goods than she actually needs. The amount that other families of the same size might be expected to purchase was fixed by this unholy example of the wasteful housekeeper. The closer a man's purchases came to the figure thus affixed to his account the better he would fare in the allotment of places and jobs in the mine. I am glad to say that such practices have few advocates. Mine operators today realize that the effort to influence a man in respect to the amount of goods he should purchase for his family does not foster thrift.

There are numerous examples of superintendents and foremen, however, who hold their positions mainly because they are good trade-getters. To some extent their mining ability is considered second to that of hiring and keeping men who patronize the company store. The results of such a policy are plainly evident in a mine run on this plan. One can readily pick out from among the workmen those who are the best buyers by the positions they hold in the mine. Discipline in such mines is lax, and rules and regulations relating to safety are often poorly observed. Much time, labor and material are wasted, because everyone does nearly as he pleases. This careless disregard of mine regulations is engendered by the feeling that a man's place in the mine is secure as long as he has a good store account.

One can readily judge of the conditions in a mine where the mine foreman is obliged to keep his eye on the store and nurse its interests, subordinating the mine work to the store sales. Indeed, it is a safe guess that the cost of producing coal in the mine is proportionately high as the store sales exceed a normal average. Conditions in the store are said to be good when, say, 50 per cent. of the payroll is issued in checks, which is quite generally the case when the mine is running full time. When work in the mine falls below three days a week, the percentage of store checks deducted from the payroll is increased.

A mine employing, say, 100 men and working four days and producing 3,000 tons a week can easily afford to lose 3c. a ton in the cost of production if 40 per cent. of the men's wages goes into the store. An estimate shows that when the mine works three days a week the store checks must total 60 per cent. of the payroll, or 50 per cent. when the mine works less than three days in the week. I have known cases where 5c. a ton could be lost in the cost of production without showing a deficit when 55 per cent. of the payroll was entered as store checks. This of course does not include the rent on company houses.

Miners Not Encouraged To Buy Homes

I had not intended to say anything about miners' houses, but it seems necessary to explain here why so few miners buy homes for themselves. There are three principal reasons for this: First, to buy or build a house, it becomes necessary for a man to economize, which means that he spends less money in the store as well as purchases his goods where they are cheapest. Neither of these conditions, however, is in line with the policy of the company. Secondly, when a man has bought or built a house, he stops paying rent, and this again affects the company's income from that source. Thirdly, it is often remarked that employees who own their own homes are "too independent." Their homes are generally located at a little distance from the camp, which may make it inconvenient for them to do all their trading at the store. The policy of the company is to keep the company houses full in slack times, and as a consequence men renting company houses are retained on the payroll, while those owning their own homes are often laid off at such times. Such a policy when followed offers little inducement to men to be thrifty and saving enough to buy a house.

Company Store and Houses a Source of Profit

As shown by data collected by the Census Bureau, there are numerous coal operations where no money is made on the sale of the coal, but the business depends on the profits realized in the stores and the renting of the company houses, which profits are sufficient to pay interest on the whole investment. I know some mining towns in West Virginia, which are unfortunately few in number, where the rents charged are fair, considering the quality of the houses and all that goes with them. The houses are substantially built, roomy and plastered. They are located within fenced inclosures of large area, each house having its own vegetable garden and supplied with wholesome running water at all times of the year. The streets are graded, have fine sidewalks and are lighted by night. I know personally that the rents are just sufficient to pay a moderate interest on the investment, after providing for maintenance and amortization.

Such towns have solved, as nearly as it is possible to do, the problem of keeping a regular nucleus of steady men at work in the mines for a number of years. The managements are generally broad-minded and satisfied with smaller store profits, as proved by the trade they succeed in holding. More attention is given to the mines than to the store, and as a result the former are kept in the best condition. Such operators always realize a few cents' profit on every ton of coal taken from the mine.

In reference to the store question, I fear that if the policy of conducting that business at some mines is not changed radically, operators guilty of such practices as those described will be compelled by law to abandon the business. PICK.

Charleston, W. Va.

Letter No. 6—The invitation of *Coal Age*, Oct. 16, p. 619, if responded to with frankness by those who know, would make interesting reading, not only to coal men, but to the public in general, as the question of scrip has given rise to many misconceptions and not a few laws and investigations.

The issuing of store checks in some form or other is almost universal in connection with commissary business. As is usual, it has been the abuses of the system that have caught the attention of the public. Anyone reading the records of the Federal and state investigating committee and being himself familiar with the subject will be struck by the lack of information on the part of even men of affairs, as shown by the questions asked. One United States senator seemed to have the impression that coal companies never paid in money, and when he asked a miner how much he could buy with a dollar check and the miner grinned, he did not seem to see anything amusing.

Of course a mining man in one part of the country may not be able to speak with authority as to practices in remote districts, but exchanges of business confidences have served to give us a pretty fair idea of commissary customs over the country, sufficient to enable one to generalize somewhat.

VARIOUS KINDS OF STORE CHECKS

The crudest form of store check is a cardboard ticket or metal tag with simply the denomination and the name of the company stamped thereon and good for merchandise either at the company store or some other store designated by the company. Some companies issue books of tickets similar to ice or meal tickets, usually nonnegotiable. Where the company does not directly issue checks, the miners themselves sign requests for credit, which when properly countersigned by the timekeeper are honored by the clerks in the commissary.

From the company's point of view, it is hard to see anything but necessity in these various methods of facilitating business. We will not go into the necessity for company stores themselves. In some places they seem absolutely necessary, and some of the arguments for store checks seem more or less convincing. For example, a new miner arrives at a camp, "broke," not having a cent to buy his supper, or to feed his family. The company can do one of several things—send him on to the next camp, advance him cash, write an order to the commissary or give him a store check and charge him on account. If he is "turned down," he will readily find another camp willing to take a chance. If he is given cash, he is more apt to leave than stay. An order on the commissary will have to be audited in several different ways, and in the end it simply answers the same purpose as scrip, but lacks the convenience. He is given a store check for a dollar or two, so arranged that a punch will cut out the amount spent, by which the thriftless man is served. He may go to work or he may deal out his check and leave. If he works the check will be deducted from his pay. If he "beats it," the store has lost only the cost of the merchandise and not so much cold cash.

At a store in a mining camp there are certain times of the day and certain times of the month when there is a rush for supplies. It is not like a village store or a department store where the trade comes leisurely. The commissary clerk has many duties besides selling supplies, and when the whole camp turns out and wants to be served at once, you may see the convenience of the scrip. One snip of a punch serves the purpose of making change at the cash drawer or charging an account. Coal camps are often in out-of-the-way places, and large accumulations of cash would tempt robberies, while the check system does not necessitate keeping much cash in the store. There are much less bookkeeping and no long lists of purchases to wrangle over. There is a record of the issuing of the check, and that is the end of it so far as the company is concerned.

A MISTAKEN POLICY

But the question has been raised as to the thrift of those electing to draw store checks, and mention has been made of discounting the checks. This would indicate that there is still some public misconception or else some private abuse. The more thrifty miners will not spend more than they make, but the question of thrift does not enter into the manner of purchasing supplies, whether with cash or with tickets. A dollar ticket purchases just as much as a dollar cash at the company store. The only question of discounting store tickets comes up when the man without money does not wish to wait till payday, and he gets his more thrifty neighbor to cash his ticket at about 80c. on the dollar. No company of repute will itself discount store checks nor allow its officers to do so. It is not so much a matter of any moral wrong as of a mistaken policy. No good company permits it.

The appeal to abolish the store-check system seems to be based either on a misconception of the practical working of the system, or on the ground of making it more difficult for the miner to spend his money, thus forcing him to economize through sheer inconvenience.

As to forcing economy by making it more difficult to spend money, we all know there is something in this. We often hear coal men speak of being able to save a little money on a salary that in town would be gone before the next payday or carrying a nickel around for a week without a chance to spend it. But it may well be doubted whether the man who is forced into saving money in this way will ever prosper by thrift.

Laying up labor in the mine office may be likened to putting money in a bank, only it is never placed on deposit, but the miner and usually the whole family draw on it by store checks. The thrifty miner usually does the drawing himself and much of the dealing himself. After all, it is the old question of who is to be boss in the family. Men in general who have laid up wealth and a comfortable bank account would probably have nothing to show if wives and children were given checkbooks and allowed to draw on account at will. But this is precisely what happens in the mining camp. Often the miner has no idea whether he is going to draw any money or not on payday. There are men whom I as payroll clerk have not seen around the store or office for months at a time. Their families draw all their wages as fast as the time is turned in.

THE "WOMEN'S PAYDAY"

Those familiar with mine-office work understand what is meant by the "women's payday." It is the day immediately after the closing of the time sheets of the month or half-month when all checks drawn will not be charged against the payday balance, but against the time for the next pay. I have seen women come in on those occasions and draw as much as $30 or $40 in scrip, sometimes buying supplies for the month, but often indulging in purchases which they could not afford. When a crowd of these women are waiting to be served with "first-of-the-month" store checks, it is interesting to note all the little byplays indicating the social aspirations of the village matrons. Some will hold back to see how much the others are going to draw. Mrs. A., whose husband is a contractor, will carelessly call for half of her husband's credit, and then Mrs. B., whose man is also one of the high-wage earners, will go a few dollars better, and the rest of the women all enjoy the effect as much as butterflies of the ballroom enjoy their social triumphs.

Yes, there is little question but that store checks stimulate trade at the company stores. A buyer, after getting the supplies he came for and having five or ten cents left unpunched, will wander around and try to think of something to spend it for, usually hitting on candy. In other words, the tendency is to save the silver dime, while the ten cents on the check will be spent, but it would not seem fair to blame the system for such thriftlessness. No, it is doubtful whether store checks can be indicted for the thriftlessness around mining camps. It is perfectly true that if you refuse to sell or make trading inconvenient there will be more money drawn on payday, but some women keep their husbands sober by drawing up all their credit so they will not draw money on payday.

THE MINE OFFICE A BANK

I have likened the mine office to a bank where labor is deposited. There is this difference: Where the miner is prodigal with his paper money, the company also is apt to fall into the same attitude, and when a miner's account is overdrawn there is not the same care in stopping the checks as in a bank where money is given out. We would hardly hand out a dollar in cash to a miner who had no time in, but he must have a bad reputation indeed if we refuse him a dollar scrip to get tobacco or provisions.

One large company, operating in several states, some years ago charged off over $50,000 in bad accounts made largely by issuing store checks beyond the credit of the miners. That $50,000 was just the same in purchasing value to the men as $50,000 in gold, and all companies charge into profit and loss every year overdrafts that are no longer good.

The proposition of doing away with the store-check system in order to encourage thrift in the coal camp is one thing, and the substitution of a better system is another. It is well to note that, on account of the foreigners and the illiterate natives, every system of accounting about the mines must be of the simplest kind. Check numbers are given these men; pegs are stuck into a hole to keep the tally of the cars; a metal check is hung on each loaded car by the miner; every kind of count is kept in a way that is easily and quickly understood. While their memories are usually good, they cannot be relied on for proofs in case of disputes in bookkeeping, nor can the average miner be expected to understand a very complicated system of debits and credits. In the check system, the miner wants a credit of a dollar. He gets a check with a hundred numbers on it, and he receipts for it. He carries it and personally superintends the punching out of each number until the dollar is gone, and there is no chance for dispute. The plea is made for him to save his money and get everything on a cash basis. How much business does the world do on a cash basis? The thrift that has made wealth comes more from the judicious handling of debits and credits than from cash transactions.

DOING AWAY WITH THE STORES

Those who think they discover a certain iniquity in the union of a coal operation and a commissary and who have advocated a divorce would speedily solve the check system by doing away with the stores. Very few coal men would contend for a minute for the commissary were it possible to operate without it. Either the isolation of the plant demands it or the profit is needed to make operating possible. There is a profit in the company store coming from the large amount of business done with a small force of men who would have to be around the office anyway.

Thrift cannot be forced on a community by any artificial means. It must start with the individual, and it only becomes a community virtue when the moving spirits of the community are thrifty. Miners are "good spenders" and are proud of that distinction. We often hear it said that any industrious miner could save up money and make himself independent. This is probably true of an industrious, thrifty workman of any trade, but it is more especially true of the miner.

However, we sometimes forget that there is a social life to be maintained in every stratum of society. The habit of spending freely is almost considered the virtue in a mining community, and not many miners care to save money at the expense of their popularity. They will fight for a few cents on their accounts, but waste twice as much to show their contempt of being called saving.

The other evening at a meeting where some demonstrations were being made with mine gases the lecturer called for some small boy who wanted to make a nickel to get a pitcher of water. Although there were a dozen miners' sons in the house, the manager of the company was a little embarrassed to see his own boy eagerly come forward, and he wanted the nickel too. Did you ever have any experience with small boys in a mining camp? This question of thrift and store checks will bear some very careful study before generalizing too much as to its cause and effects. JOSIAH KEELY.

Kayford, W. Va.

Efficient Mine Foremen

Letter No. 12—The discussion of what constitutes an efficient mine foreman has interested me greatly, and I am inclined to add a few suggestions along this line.

It must be admitted, in the start, that the mine foreman holds a very responsible position. Indeed, his responsibility is far greater than what one man should bear. He is held responsible for the safety of every man working in the mine, so far as the conditions existing therein are concerned. He must see that the mining law is obeyed in every respect—that the mine is well ventilated, so that the air current is conducted properly throughout the mine and made to sweep the face of every working place. He must see that the haulage roads, travelingways and air passages are kept in a safe and healthful condition. He must personally inspect the working places in the mine to see that they are well-timbered and safe for work. He must give the necessary instructions for the placing, charging and firing of holes in blasting the coal and roof. He must examine all reports of the firebosses and assistant foremen, and know that the working places are free from gas and that all falls and abandoned places have been properly examined.

Foreman's Relation to Other Mine Officials

In addition to these responsibilities, the company holds the mine foreman accountable for the daily output of coal. The miners expect him to settle their numerous and often petty troubles and disputes, arising from the unequal distribution of cars or any delay in the cutting of their coal by machine and other causes real or imaginary. The superintendent holds the foreman responsible for seeing that his orders are carried out with respect to the development and operation of the mine. The manager holds him responsible for the daily and monthly cost sheets and the upkeep of the equipment—the condition of the mules, motors and other machinery and mine supplies. The mine inspector holds the mine foreman responsible for compliance with the mining law and the safe and sanitary condition of the mine.

In view of these almost endless responsibilities, it is plain that the efficient mine foreman must be an experienced miner, driver, motorman, trackman, timberman, bratticeman, electrician, machinist and, finally, an expert in first-aid work. In other words, he must be experienced in every branch and department of coal-mining work.

Important Points Neglected

It is to be regretted that nearly all mine foremen who have passed the examination and been granted a certificate of competency think there is no further need of studying, when in truth that is just the time they should begin to study harder than ever. It is my belief that all mine foremen should be examined every four or five years, which would require continuous study and improvement on their part and make them more efficient, alive and uptodate.

Another point that is sadly overlooked or neglected occurs in connection with the granting of certificates of competency to applicants who have failed to furnish the examining board with sufficient evidence of their sober character and temperate habits. In many instances the members of the examining board are less to blame for this condition than the mine officials and politicians who frequently recommend men for these positions without a sufficient knowledge of their character and habits. Most mining laws require that applicants for these positions of responsibility shall be men of "good moral character and known temperate habits."

In my opinion examining boards should give this matter closer attention and require of applicants more specific information than is conveyed through a recommendation from a friendly mine official, politician or acquaintance. All applicants should be required to furnish an affidavit, sworn to before a justice of the peace or some other county official, specifying his character and habits. When it is remembered that the lives of hundreds of men are daily placed in charge of the mine foreman, assistant mine foreman and fireboss, it will be realized that this is a grave question relating to the character of these officials and one that should receive the most careful attention before a certificate is granted to an applicant.

Results of Certifying Incompetent Foremen

It may be argued that a mine official of this type—one who is somewhat the worse for drink and, as a consequence, neglects his duties in the mine—cannot long hold his position. The time is long enough, however, for him to put the mine in a dilapidated condition and to be the direct or indirect cause of the loss of many lives and other accidents. A mine foreman who does not properly attend to his duties soon runs up the cost of production, and the condition of the mine becomes such that it will require months of hard work on the part of a more efficient man to again put the work on a paying basis.

It is strange that many operators and superintendents fail to realize that there is a great difference in the value of different mine foremen to the companies who employ them—that some foremen are worth two or three times what other foremen are worth. It is unquestionably a great mistake to regard all foremen as capable of drawing the same pay when the difference between them is as great as that between day and night. These men should be paid on a basis of their efficiency, and there would then be a greater incentive for mine foremen to strive for their own improvement. There is always a certain satisfaction in the efficient foreman receiving the commendation of the mine inspector and knowing that the mine in his charge is in a safe and healthful condition. This satisfaction, however, does not compensate wholly for the hard work such a foreman performs in order to develop and maintain this condition in the mine.

In closing, permit me to say that I have known mine foremen and firebosses who, within two months after receiving their certificates, have neglected their duties and returned to their habits of drinking to such an extent that their certificates were taken from them. This, however, was not done until the lives of many miners had been endangered by the neglect of the men whose duty it was to care for their safety. Had the examining boards been more particular and made it their duty to investigate the character of applicants, such instances could not occur with as much frequency as they have in the past.

OLIVER YOUNG,
Nu Mine, Penn. Assistant Mine Foreman.

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The Study Course in Coal Mining was necessarily omitted this week, but will appear as usual in our next issue.

Inquiries of General Interest

Haulage on Inclines

I was interested in reading the two articles relating to haulage on inclined planes, *Coal Age,* Nov. 13, p. 816, and there are two questions that I would like to ask. The first is, Is not the allowance made for track resistance—namely, 40 lb. per ton, or 2 per cent. of the load hauled—very low?

The second question is, Why do you multiply this track resistance by the cosine of the angle of inclination of the plane? That makes the track resistance, which is due to the entire friction of the moving load, less as the inclination of the plane is greater. For example, it shows that the track resistance is less on a 30-per cent. grade than it is on a 25-per cent. grade. I have always supposed that the friction of a moving load was independent of the grade of the track; or, in other words, that the frictional resistance of a trip of cars moving up or down the grade was the same as when moving on a level track.

California, Penn. MINE FOREMAN.

Replying to the first question, in regard to track resistance: Track resistance is given by different authorities as ranging from 20 to 50 lb. per ton of moving load. The actual amount of resistance, in any given case, depends on numerous conditions relating to the condition of the rolling stock and of the track, the size of wheels used and style of bearings, degree of lubrication, etc.

In order to make a safe estimate of drawbar pull, under the adverse conditions incident to coal mining, a track resistance of 50 lb. per ton is often employed, although this is acknowledged to be much greater than what should be allowed under fairly good working conditions. It is customary for manufacturers of mine locomotives to use a value of from 20 to 30 lb. per ton in estimating track resistance. It is partly due to the strong competition in this branch of the coal industry that a lower track resistance is assumed by manufacturers than is often advisable to allow in actual practice.

Nothing is more annoying in the operation of a mine than the stalling of a loaded trip, because of the actual track resistance being somewhat greater than that allowed by the manufacturers of the locomotive in use. This condition, of course, can be remedied by the proper upkeep of the mine roads and maintaining the rolling stock in the best condition, but often this is neglected in mining practice. When hauling a long trip of mine cars loaded to their capacity, the size, kind and condition of the car-wheels are important factors in determining the amount of track resistance per ton.

For the reasons mentioned, when the conditions in the mine are not described or known we prefer to use a track resistance of 40 lb. per ton for haulage on level tracks, assuming fair average conditions in the mine and allowing a margin that will provide against possible exigencies.

Replying to the second question: When hauling on an appreciable grade, say a grade exceeding 10 per cent., the normal pressure of the load on the track is considerably less than the weight of the load. This normal pressure varies as the cosine of the angle of inclination. It is the normal pressure of the load on the track that determines the amount of track resistance, the latter being a percentage of such normal pressure.

On a level track the normal pressure is equal to the weight of the load, the inclination of the track being zero and the cosine of its angle 1. As the inclination of the plane or the grade of the road increases, the normal pressure of the load on the track decreases with the cosine of the angle and becomes zero when the angle of inclination is 90 deg., as in a vertical hoist where the normal pressure of the load on the guide-rails becomes *nil* and the track resistance reduces to zero. This is the condition when hoisting in a vertical shaft. For the reasons given, it is necessary when estimating haulage on an incline greater than, say 10 per cent., to multiply the track resistance for a level track by the cosine of the angle of inclination of the plane.

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Blower vs. Exhaust Fans

What is the reason that a blower fan operates under a comparatively higher water gage than an exhaust fan working under the same conditions in respect to the mine and driven at the same speed? THOS. MCMANUS.

Manifold, Penn.

Assuming the same type and size of fan in each case, the difference between these two systems of ventilation is that when the fan is blowing, the air within the fan commonly has a greater density than when exhausting. During the major portion of the year the mine air is generally warmer and therefore lighter than the outside air, and when much gas is generated its presence has a tendency to further decrease the density of the air.

Owing to the greater density of the air within the fan when operating as a blower, a somewhat greater power is required to produce the same speed. Also, the efficiency of the fan is increased to a slight extent. For these reasons, a fan operated as a blower will generally yield a somewhat higher water gage than when exhausting at the same speed and under the same conditions in respect to the mine.

This difference, however, is almost inappreciable, and when a higher water gage is observed in these two systems of operation, it is generally due to other hidden causes that are frequently unobserved. For example, there frequently exist in the mine natural motive columns that may either assist or oppose the circulation induced by the action of the fan. These hidden and unobserved natural columns are often potent factors in increasing or decreasing the water gage observed in the fan drift. It is important in making fan tests to eliminate the influence of such natural air columns existing in the mine, in order to obtain a truly comparative test of the fan.

Examination Questions

Miscellaneous Questions

(Answered by Request)

Ques.—With a water gage of 0.6 in., the quantity of air passing in an airway is 24,000 cu.ft. per min.; what water gage will be required to pass 36,000 cu.ft. per min. in the same airway?

Ans.—For the same conditions in the mine or airway, the unit pressure or water gage varies as the square of the quantity of air in circulation. In other words, the water-gage ratio is equal to the square of the quantity ratio, which gives in this case

$$\frac{w.g.}{0.6} = \left(\frac{36,000}{24,000}\right)^2 = \left(\frac{3}{2}\right)^2 = \frac{9}{4}$$

$$w.g. = \frac{0.6 \times 9}{4} = 1.35\ in.$$

Ques.—The diameters of two circular airways are 3 ft. and 4 ft. respectively. If a pressure of 5 lb. per sq.ft. will produce a given circulation in the 4-ft. airway, what pressure will be required to produce the same circulation in the 3-ft. airway?

Ans.—For circular airways of the same length, the unit pressure producing circulation varies inversely as the fifth power of the diameter of the airways. In other words, the pressure ratio is equal to the fifth power of the inverse diameter ratio, which gives in this case

$$\frac{p}{5} = \left(\frac{4}{3}\right)^5 = \frac{1,024}{243}$$

$$p = \frac{5 \times 1,024}{243} = 21.07\ lb.\ per\ sq.ft.$$

Ques.—In an airway 6x8 ft. in section and 1 mi. long, a water gage of 1.2 in. produces a velocity of 500 ft. per min. If the length of this airway is increased to 2 mi., what water gage will be required to increase the velocity of the air current to 750 ft. per min.?

Ans.—For the same cross-section of the airway, the unit pressure or water gage producing circulation varies directly as the length of the airway and the square of the velocity of the air current, which gives in this case

$$\frac{w.g.}{1.2} = \frac{2}{1} \times \frac{750}{500} = \frac{2}{1} \times \frac{3}{2} = 3$$

$$w.g. = 1.2 \times 3 = 3.6\ in.$$

Ques.—In a mine giving off 2,500 cu.ft. of marsh gas per minute, the volume of air entering the mine at the intake opening is 4,500,000 cu.ft. per hr.; what is the percentage of gas in the return airway?

Ans.—The volume of air entering the mine is 4,500,000 ÷ 60 = 75,000 cu.ft. per min. Adding to this the volume of gas generated per minute gives for the total volume of air and gas in the return airway 75,000 + 2,500 = 77,500 cu.ft. per min. The percentage of gas in this return current is then

$$percentage\ of\ gas = \frac{2,500 \times 100}{77,500} = 3.23\ per\ cent.,\ nearly$$

Ques.—A ventilating fan 16 ft. in diameter and 8 ft. wide, running at a speed of 100 r.p.m., is producing 125,000 cu.ft. of air per minute against a water gage of 2 in. (a) At what speed must this fan be run to produce a volume of 150,000 cu.ft. per min. in the same mine? (b) What will be the water gage at this increased speed?

Ans.—(a) For the same conditions in the mine or airway, the speed of the fan varies as the fourth root of the fifth power of the quantity of air in circulation. In other words, the speed ratio is equal to the fourth root of the fifth power of the quantity ratio, which gives here

$$\frac{n}{100} = \sqrt{\left(\frac{150,000}{125,000}\right)^5} = \sqrt[4]{\left(\frac{6}{5}\right)^5} = \sqrt[4]{1.2^5} = 1.256$$

$$n = 100 \times 1.256 = 125.6\ r.p.m.$$

(b) For the same mine or airway, the water gage varies as the square of the quantity of air in circulation. In other words, the water-gage ratio is equal to the square of the quantity ratio, which gives here

$$\frac{w.g.}{2} = \left(\frac{150,000}{125,000}\right)^2 = \left(\frac{6}{5}\right)^2 = \frac{36}{25} = 1.44$$

$$w.g. = 2 \times 1.44 = 2.88\ in.$$

Ques.—If a water gage of 1 in. is required to circulate 50,000 cu.ft. of air per minute, in a certain mine, what will be the volume of air in circulation when the water gage is increased to 1.6 in., by increasing the power?

Ans.—Since the increase in water gage in this case is due to an increase in power and is not therefore owing to any change in the mine or airway, the quantity of air in circulation in this case varies as the square root of the pressure or water gage. In other words, the quantity ratio is here equal to the square root of the water-gage ratio, which gives

$$\frac{Q}{50,000} = \sqrt{\frac{1.6}{1}} = \sqrt{1.6} = 1.265$$

$$Q = 50,000 \times 1.265 = 63,250\ cu.ft.\ per\ min.$$

Ques.—If a mixture of air and gas, at its most explosive point, is passing through an entry 6x8 ft. in section, at a velocity of 400 ft. per min., what quantity of air will be required to dilute this mixture until it contains only 1 per cent. of gas?

Ans.—The total volume of air and gas passing in this entry is 400 (6x8) = 19,200 cu.ft. per min. A mixture of marsh gas and air (CH_4), at its most explosive point, contains 9.46 per cent. of marsh gas when no other gases are present. On this assumption, the quantity of gas present in the current circulating in this entry is 0.0946 × 19,200 = 1,816.32 cu.ft. per min. Now, if this gas is to form 1 per cent. of the return current, it will be necessary to add sufficient air to make the total volume of air and gas on the return 1,816.32 ÷ 0.01 = 181,632 cu.ft. per min. In that case, the volume of air to be added is 181,632 — 19,200 = 162,432 cu.ft. per min. The total volume of air in the return current, under these conditions, is practically 181,632 — 1,816 = 179,816 cu.ft. per min.

Coal and Coke News

Harrisburg, Penn.

The State Insurance Board will have many perplexing problems to face, and has a difficult task ahead to carry out its proposed plan to handle liability insurance at 10 per cent. less than the amount agreed upon by commercial underwriters, according to opinions expressed by leading insurance men, manufacturers and coal operators who attended the Efficiency and Welfare Convention at the Capitol during the week.

It was predicted that in view of the fact that the state board must take the hazardous business which the insurance companies refuse to accept, its business would be lopsided. Some assert that the state fund would not be popular with the manufacturers and the large coal companies of the state, because they believed it would place too much power in the hands of the politicians.

It was the general opinion among those who attended the conference that the State Insurance Board would be entitled to the 10 per cent. discount, because of the extra hazardous risks it would be forced to assume. One of the risks that must be taken by the board will be that of coal mines. At the present time there are 10 leading insurance companies in a pool to underwrite unlimited compensation for coal mines. It is said that not one of the companies would attempt to assume such a risk alone.

It is pointed out that as a result of the unfortunate experience of the State Insurance Board in West Virginia, where an explosion in a coal mine is said to have sent the board into bankruptcy, the members of the board would see that the rates in Pennsylvania would be ample and probably excessive.

The state fund can only protect the employer for his obligation to pay compensation required by law. If any action is brought under the common law to recover for impairments or disfigurement or any case where the employer may be denied compensation, the state fund does not protect.

Stock Companies May Assume Entire Risk

The stock companies by their contract will assume the employer's entire obligation to pay compensation and also settle any claims, defend any suits and pay all expenses incident thereto without limit. Therefore the state contract fails to give protection of a necessary kind, and it is claimed, should be sold at a less rate than the stock companies, as above described. Another point argued is, that an injustice of the state fund is that all citizens, whether they are interested in the fund or not, will be taxed to pay the expenses of the administration with its few members.

The workmen's compensation board has announced that all information given by persons, companies or others applying for exemptions from insuring shall be considered confidential as are corporation reports on earnings to the auditor general. It was also decided that such information cannot be used for purpose of taxation.

During the discussion of the act while pending in the Legislature the opposition, argued that married men and aged men would be discriminated against in employment, the former because the liability for workmen with families is greater than for those without families, and the latter because the aged were more liable to injury than younger workmen.

The fear of discrimination is largely without reason. In the first place, an employer need not pay a higher rate of insurance for the married employees than for the unmarried one, nor a higher rate than for the younger one. The fact that rates are uniform will give no cause for discrimination. If the damages came directly out of the pockets of the employers, the case might be different, at least in respect to the aged employees.

Messrs. Scott and Leach of the Workmen's Compensation Board say that married men are as a rule more careful than those who are not married. They have a better realization of their responsibility as wage earners for families.

The only drawback the law can have upon the employment of old people is the fact that insurance rates will be based upon the average payment in the way of liability. The fewer the accidents the less the cost of insurance. It is possible that employers will deem it to their interest to reduce the liability, in case there are too many accidents among aged employees, in order to secure more favorable terms. But the tendency even now is to place employees made infirm by reason of age in positions where accident liability is at a minimum.

Appeal Is Taken to Supreme Court

Upon the application of G. Carrol Todd, assistant to the United States Attorney-General, Judges Buffington, McPherson and Hunt, in the United States District Court, on Nov. 19, allowed an appeal to the United States Supreme Court in the suit of the Government against the so-called anthracite coal trust, which was virtually dismissed by the Federal Court in a decree filed last month. While the court ordered the Central R.R. of New Jersey to divorce its interests in the Lehigh & Wilkes-Barre Coal Co., holding that this action would attain the ends sought by the Government, the prosecutor is not satisfied and will seek to have all of the defendants, which includes the Reading Co., the Philadelphia & Reading Coal and Iron Co., and other hard-coal-carrying railroads, adjudged violators of the Sherman anti-trust act.

Fourteen errors are assigned in the petition for the appeal. It is contended that the Court erred in refusing to sustain the entire complaint of the Government and also to adjudge the Reading Co., the holding corporation, a combination in itself in restraint of trade. The Government's attorney pointed out that the court erred in refusing to dissolve the union of the Philadelphia & Reading Coal and Iron Co. and the Lehigh & Wilkes-Barre Coal Co., which was found to be an illegal union, by requiring the Reading company to dispose of its controlling interest in the capital stock of the Central R.R. of New Jersey. In other words, the Government seeks to have the Court dissolve the more powerful corporation instead of the minor subsidiaries.

PENNSYLVANIA

Anthracite

Nesquehoning—Five hundred employees went out on strike at the Lehigh Coal and Navigation Co.'s No. 6 shaft on Nov. 18, because a number of workmen had been suspended. The employees of No. 14 and Spring Tunnel operations are still on strike, 1,900 being affected. Until the 18th, in its retrenchment policy the company laid off only men employed on nonproductive work, but orders were given that some miners and laborers be laid off. The company officials say these orders are not permanent, but that different men will be laid off at different times as the occasion arises. Thus far about 475 men have been suspended.

Scranton—The People's Coal Co. has offered to contribute $1,000 a month during the continuation of its mining operations to a fund to be devoted to the repair of properties damaged by mine caves in its workings. The only condition imposed by the company is that one of its representatives be allowed to sit on the board which will have charge of the distribution of the money. This practically means it is thought the solution of the mine cave problem in Scranton as the company has already promised to take every practical precaution in the mining of coal, the back filling of workings as the coal is taken out, and the supporting of the surface vein with numerous props. It is explained by the company that it would rather coöperate with the people of West Scranton in the solving of the cave problem than to expend the money in legal battles. The expenditure of the fund would be done by a board named by the protective association which would have a representative of the coal company as a minority member.

Wilkes-Barre—The Lehigh Valley Coal Co. recently leased the Lattimer coal stripping lying at the west of its Drifton tract, and will shortly start work on the new property. This company is also arranging for new strippings at Buck Mountain, and will also start excavation at Oneida.

Coaldale—The nine men who were entombed for six days in the Foster tunnel of the Lehigh Coal and Navigation Co., have been paid regular hourly wage rates for the entire time they were shut in by the fall of coal. After being rescued they were placed on half pay until able to resume work.

Shamokin—The Philadelphia & Reading Coal and Iron Co. was recently awarded the contract for building public roads in New Castle, Norwegian, Branch, Reilly, Cass, Foster, Butler, Mahanoy, and Frailey townships. This firm pays more taxes in these districts than all the other taxpayers combined, and has found it cheaper to build roads at its own expense than to pay for this work in taxes.

Fire believed to have been of incendiary origin recently destroyed the blacksmith and carpenter shop at the Hickory Ridge colliery, resulting in the complete destruction of the building, together with all its contents, entailing a loss of more than $1,000.

Bituminous

Connellsville—Coke operators throughout the Connellsville region are working their plants six days per week and firing additional ovens whenever labor therefor can be obtained. Production recently amounted to 427,000 tons, with shipments to 430,000 tons. Merchant plants are, generally speaking, cleaned of stock. There are not enough men in the region to operate the ovens already fired, and many of the men now at work insist on extra holidays every week, so that the labor situation is becoming acute.

Salina—A runaway mine car resulted in the destruction of the tipple of the Apollo Coal Co. recently. The car broke loose at the top of the incline, ran down the grade, and through the tipple, upsetting a small heating stove. Fire followed, and the tipple was destroyed.

New Castle—Alleging that a horse and a cow were killed, and several other domestic animals made dangerously sick by drinking poisonous mine water drained on his property from the works of the Consolidated Stone and Mining Co., James S. Moore, a farmer of Wayne township, recently brought suit in the prothonotary's office to recover damages to the amount of $5,000.

Reynoldsville—R. A. Cartwright, E. B. Newton, and others interested in the Panther Run Coal Co.'s mine, are opening a new mine nearer town, which will employ about 400 men, and will be operated entirely by electrical machinery.

Homer City—The Homer City Coal Co. has purchased a tract of land from the Tearing Run Coal Co., and has turned it over to the miners to be farmed. Later houses will be built on the tract, which comprises about 30 acres.

Cresson—The coke ovens of the Pennsylvania Coal and Coke Corporation are to be fired in the near future, it is stated. The increase in the demand for coke will boom things in the mountain town this winter, in the opinion of coal operators and others. The mines of the Pennsylvania Coal and Coke Co. are working again, after having been idle for several months.

Gallitzin—A little oil lamp exploded in one of the six dwelling houses owned by the Baker-Whitley Coal Co. on Nov. 17. A few minutes later the entire row was afire. The houses were burned to the ground, and while no one was injured a number of inmates narrowly escaped cremation. The loss is about $10,000.

Pittsburgh—Negotiations said to be in progress for several thousand acres of coal lands in Greene County may aid J. V. Thompson's effort to raise money to pay his creditors. He owns considerable land in that section. The Bethlehem and Midvale steel companies are seeking to buy virgin coal properties to make themselves independent of the United States Steel Corporation. Both the Bethlehem and Midvale steel companies are big consumers of Connellsville coke. A subsidiary of the United States Steel Corporation, the Frick company, has dominated the situation and dictated prices to all big steel plants. With the expansion of the Bethlehem and Midvale companies, both realized the necessity of obtaining an independent supply of coke. The Fayette County coking coal lands being held by Steel Corporation interests both companies turned to the virgin tracts in Greene County. Options have already been secured it is said on nearly 3,000 acres from Mt. Morris to the Fayette County line.

WEST VIRGINIA

Charleston—The free employment bureau of the state department of labor recently received a request for 75 miners for work along New River. Mining companies of that district declare that they need many men at once.

Forty fatal accidents in and about the mines of the state occurred during October, according to the report issued by Earle A. Henry, Chief of the Department of Mines. Fourteen fatalities occurred in Fayette county, nine in McDowell, four each in Logan and Marion, three in Kanawha, and one each in Brooke, Clay, Harrison, Mercer, Putnam and Raleigh. Chief Henry takes the occasion of calling attention to the fact that the majority of fatalities in the coal mines of the state, aside from those caused by explosions, are due to falls of roof and coal. He has therefore instructed all mine foremen and their assistants to spend more time inside the mines than they have heretofore done. He says that many accidents would not occur if these foremen were less indifferent to discipline and the examination of dangers that continually surround the miners.

Bluefield—The report of the coal handled by the Norfolk & Western R.R. during October would indicate that the coal traffic for 1915 will exceed that of last year at least 5,000,000, and possibly more. Such an advance in the road's tonnage in one year would more than double any previous yearly increase, the average since 1909 being about 2,000,000 tons annually. Heretofore the Norfolk & Western has been the fourth largest coal carrying road in the United States, being exceeded by the Pennsylvania, the Baltimore & Ohio, and the New York Central lines. It would appear now that the Norfolk & Western is destined to take place at the close of this year as the country's second largest coal carrier.

ALABAMA

New Castle—The 387 ovens of Ramsay & McCormack will be fired immediately to take care of a contract of 150 tons of coke per day for 12 months time for shipment to the Sloss-Sheffield Steel and Iron Co. for use at the North Birmingham furnace. This is the first time these ovens have been in use for several years.

Birmingham—The payrolls for this district being paid this month are larger than for the past seven years. Practically every industry is working full time, and the prospects for steady work are good.

TENNESSEE

Knoxville—Detailed investigation covering every phase of possible exporting of coal from the Tennessee-Kentucky section to South American markets by way of Charleston, S. C., will be made by representatives of the Southern Appalachian Coal Operators' Association as a result of the recent meeting here. Col. James R. Wooldridge, president of the association, discussed the various angles on this business in his address to the members present and special committees were appointed to look into the various phases of the possible business. A number of operators present at the meeting reported car shortages, which, according to Secretary J. E. McCoy, vary from 10 to 40 per cent. The commercial market is in good condition, it was reported, and the domestic market is improving.

KENTUCKY

Whitesburg—First shipments of coal from the plant of the Southeast Coal Co. at Seco have just gone out.

Clay—Fire recently caused $2,500 damage in the engine room of the Fairmount coal mines and put the plant out of commission for several days.

OHIO

Bellaire—The Rail and River mine No. 6 recently resumed work for the first time in almost 20 months. Only a few men went to work at the opening, but it is expected that more will be put to work shortly. When working full, the mine employs about 250 men. The output of the mines throughout this county has been, during the past week, the best since the resumption. The Grand Trunk mines are making the best time, the coal being used by the road, and subsidiary lines for fuel. The Webb mine on Wegee Creek has been cleaning up and timbering for some time.

Leetonia—The coke plant at the Cherry Valley Works of the United Iron and Steel Co. has started full operation after a shut down since the first of the year, the entire capacity of the plant of 198 ovens is being worked by about 75 additional men.

INDIANA

Indianapolis—The proposed increase in rates of 15c. a ton on coal agreed on by officials of Eastern railroads will have little effect in Indiana, it is said. It is mainly for the benefit of Ohio operators who have trouble competing with the coal from neighboring states that comes into Ohio. If it affects Indiana it will be only along the eastern border, which is already served mostly by outside operators. The proposed increase of 5c. in freight on Indiana coal shipped to points within the state is opposed by Indiana operators, however, because it gives an additional advantage to the shippers of coal into Indiana from other states.

Brazil—Coal from strip mining, in the eighth district, United Mine Workers of America, is said now to exceed in quantity that mined underground. The Globe Coal Co., of Indianapolis, which has about 800 acres lying west of this city, has just begun putting this coal on the market. The first day it produced five cars. The company has two locomotive and one steam shovel and is putting in another shovel which is said to be the largest in the Middle West. There are three veins of coal on the land. The first is 7 to 8 ft. in thickness and 18 to 25 ft. under the surface. Beneath this there are two thick veins of block coal which will be mined later in the usual way. There are now six producing pits in this vicinity; one south and one west of the city; two at Carbon and two at Patricksburg. These pits are all manned not by miners but by common laborers. Block coal miners say the pits are difficult to compete with.

ILLINOIS

Duquoin—Seven miners were injured and nearly 500 others were imperiled by a recent gas explosion in the mine of the United Mining Co., at Buckner, 15 miles east of here. The explosion was confined to one entry and thus the property damage was light

The Perry County Circuit Court has appointed three trustees to handle the estate of the late Henry Horn, Sr., large mine owner and banker, and dispose of it for the benefit of creditors in the Henry Horn bank, which closed its doors in December, 1914, following the death of Horn. The trustees are: Lucius S. Smith, president of the First Bank and Trust Co.; Henry C. Miller, president of the First National Bank, and Charles J. Eschmann, a stockholder in the Duquoin State Bank. The deposits of the bank were between $350,000 and $400,000. There was very little cash on hand when the bank closed, but it is expected that the depositors will receive between 25 and 50 per cent. from the sale of the Horn mining properties, business property and farms.

Centralia—Operators in this section have been preventing a glut of nut, pea and slack coal on the St. Louis market by unloading these grades on the ground when the demand was weak, releasing the cars and holding the fine grades until the demand improved. This policy, pursued this winter for the first time, has had the effect of keeping prices on the fine grades firm at St. Louis. The only expense incurred is the labor cost of unloading and reloading the cars. The coal has to be loaded on the cars from the tipple because none of the mines are equipped to dump directly to storage. There is little loss from deterioration as the fine grades are not affected to any extent by weather conditions.

Belleville—At 11 a.m. Nov 20 at the courthouse in Belleville, the mining property of the Tirre Coal and Mining Co., located at Tilden, Ill., was sold at public auction for the sum of $3,500. A Mr. Willhite was the successful bidder. At this writing it has not been learned what plans if any have been made for the future of the property.

Coulterville—On a change of venue from Perry County, suit has been filed at Belleville, Ill., by the bondholders against the owners of the St. Louis Coulterville Coal Co.'s mine at Coulterville, known as the Hippard mine. The suit which is for the purpose of foreclosure, has been placed on the docket for January hearing

Virden—What is possibly the last chapter to an historic old Illinois mine was enacted recently when officials of the United Mine Workers of America canceled the charter of Local No. 693 at the Old North mine at Virden, Ill. The top works were destroyed by fire last spring and the place has been idle ever since. For two years this mine held the record output for the state. As a result of trying to import negro strike breakers at this mine a serious riot occurred on Oct. 21, 1898, in which 26 lives were lost. Since that time and in commemoration of that day the miners over a greater part of the state have refrained from work on what has been called Virden Riot Day.

IOWA

Des Moines—Ten first-aid teams are to be organized in Des Moines in connection with the Iowa Industrial hospital. Demonstrations will be held by J. J. Forbes, Federal representative of the bureau of mines, who has arrived with the United States first-aid car to launch a two-weeks' campaign among the miners. Classes will attend from the mines and industrial plants in and about Des Moines. One of the demonstrations will be made by a trained team of Colfax miners. The men will be taught to handle injuries which are common in mines.

MISSOURI

Kirksville—The Big Creek Coal Co. is now paying its employees in gold and silver. On the last payday the company paid out $5,000, nearly all of which was in gold. The reason is that it is more convenient to handle coin than currency. During the winter months the amount distributed each payday is about $12,000, but it will all be paid in specie.

OKLAHOMA

Sans Bois—The Sans Bois Coal Mining Co. has reopened the mine here, which had been closed down for about a year. The increasing demand for export coal is assigned as the cause for reopening the mine.

Oklahoma City—A decrease of 410,757 tons in the annual production of coal in Oklahoma is shown in the annual report of Edward Boyle, state mine inspector, just made public. This report gives the production for the year ending June 30, 1915, at 3,321,795 tons, as compared with 3,732,552 tons last year. Machine-mined coal amounted to 23.2 per cent. of the total, an increase of 2.5 per cent. over last year. The industry gave employment to 7,669 men in Oklahoma and the net yearly earnings of miners using picks was $704.95 per capita, while the net yearly earnings of those using machines was $615.40. Work during the year was more intermittent than usual, owing to labor difficulties and the competition of fuel oil. One former coal-producing county, Haskell, has ceased to produce coal during the year, but it is stated that the San Bois mine in that county has resumed operation. New mining operations are noted in several localities and prospects are bright for an increased output of coal.

FOREIGN NEWS

Rome, Italy—There has been a report that arrangements are being made to import Japanese coal into Italy. This seems improbable, as there is plenty of English and American coal to be had if it can be transported, and the distance is considerably less than from Japan.

PERSONALS

Donald D. Conn, of Detroit, has been appointed combustion engineer of the Wyatt Coal Co., with headquarters at Cincinnati.

G. A. Bonham, for several years with the Norfolk & Western R.R. in Bluefield, W. Va., has sent in his resignation, and will shortly leave for Portsmouth, Ohio, where he has accepted a position with the Pocahontas Coal Co.

Harry Jones, a brother of John H. Jones, president of the Four States Coal Co., is negotiating for the purchase of the mining properties of the Peck Coal Co., operating at a point between Winifrede Junction and Marmet, on the main line of the Chesapeake & Ohio R.R. The capacity of this mine is about five railroad cars per day, the coal being a West Virginia splint.

James Craig recently became lost in the mine of the Creighton Coal Co., at Creighton, Penn., and wandered about for three hours before a searching party found him two miles from the mouth of the mine. Craig, a mine foreman, was making an inspection of the unused workings, when he fell into a pool of water, which extinguished his acetylene lamp and dampened his can of carbide which began generating gas, so that he was forced to throw it away on account of the danger of an explosion. In the darkness he could not find his way, but was finally located by the searching party.

James E. Roderick, chief of the Department of Mines, had his entire inspection force in attendance at the Welfare Conference held by the state in the Capitol on Nov. 17, 18 and 19, and he took advantage of the opportunity to discuss the question of accidents and the work during the winter months when the conditions in the mines are more dangerous than at any other period during the year. The present year has been particularly free from accident and it is the desire of the chief of the Department of Mines to continue the good record through the coming winter. The mining industry is becoming more active and with the resumption of operations, greater attention is required to safeguard the workers.

OBITUARY

J. M. Turner, 88 years old, vice-president of the First National Bank of Blairsville, Penn., was instantly killed on Nov. 17, by a Pennsylvania R.R. train on the Indiana branch. He had just left his home, and was desirous of boarding a street car to come in town. In crossing the tracks of the railroad he failed to judge the speed of an approaching train and was struck. Mr. Turner was well known in western Pennsylvania to banking and coal men, having been an operator in his earlier days.

INDUSTRIAL NEWS

Williamsburg, Ky.—The Peerless Coal Co., Inc., announces its progressing dissolution, D. O. Foley, president, at Williamsburg, Whitley County, setling claims, etc.

Washington, D. C.—Reductions in hard-coal rates ordered by the Interstate Commerce Commission to become effective Dec. 1 were postponed Nov. 23 until Jan. 1.

St. Louis, Mo.—The Public Utilities Commission of Illinois announced recently that it would permit the carriers an increase of 5½c. per ton in the rate on soft coal to Alton, Ill., from Illinois mines.

Roanoke, Va.—It is reported here that the rumor current in New York to the effect that the Virginia Iron, Coal and Coke Co. had been sold to the Clinchfield Corporation is false and has no foundation in fact.

Columbus, Ohio—The Toledo & Ohio Ry. Co. and the Zanesville & Western R.R. Co. have filed answers with the Ohio Utilities Commission, denying the charges that rates in Ohio on coal shipments are too high.

Reading, Penn.—The Philadelphia & Reading Ry. has placed an order for 500 steel coal cars. This now makes a total of 1,500 new cars which this company has on order, the above being in addition to the 1,000-car order placed a month since.

St. Louis, Mo.—The general offices of the Madison Coal Corporation, which have for many years been located here will shortly be removed to Chicago. This company is allied with and handles the coal properties of the Illinois Central R.R. Co.

Philadelphia, Penn.—The Midlothian Coal Co., which a year ago commenced operation in the bituminous fields of Huntingdon County, under the control of P. Heilner & Son, has been acquired by W. H. Bradford, and the output will now be marketed by W. H. Bradford & Co., Inc.

Saltsburg, Penn.—The Belmont extension of the Turtle Creek Valley R.R. from Export to near Belmont is complete, and shipments of coal will be made over the new extension in a short time by the Belmont Gas and Coal Co. Belmont residents have petitioned the Pennsylvania R.R. Co. for passenger service over this extension.

Whitesburg, Ky.—The Kentia Corporation, one of the largest holders of coal land in Harlan County, has just leased properties to the Creech Coal Co. and the Banner Fork Coal Co. on Wallen's Creek, several miles from Harlan, and developments are starting with large forces of men. Each of the companies will build good-sized mining towns.

Hazleton, Penn.—Daniel Conlin, of Milnesville, a miner, has brought suit for $40,000 damages against Pardee Bros. & Co. and Robert Fagan, foreman for that firm. While going down a gangway some time ago after completing his day's work Conlin was struck by a blast, which seriously affected his sight and in addition marred his facial appearance.

Pittsburgh, Penn.—The United States Department of Labor is unable to supply the demand for skilled and unskilled workers, and in western Pennsylvania there are opportunities for 1,500 men for work on farms, in the coal mines and in mills. In Fayette County many men are wanted at positions paying from $1.60 to $2.85 per day. Information may be had without charge at the Pittsburgh office.

Cumberland, Md.—It is understood that the Anthony M. Brady Estate of New York has arranged to take over the holdings in Webster County, West Virginia, of Col. John T. McGraw, of Grafton. Through investment in gas and electric companies, the Brady Estate is largely interested in coal for steam purposes, and it is thought that this may have been an influential factor in bringing about the transaction.

Moundsville, W. Va.—The sale of the Johnson coal mine located at Pipe Creek, which was to have been held at the Douglas Savings Bank at Bellaire, Ohio, Nov. 19, was postponed for 30 days. It is understood that the stockholders of the company are trying to get together for the purpose of settling matters, and if this can be accomplished within the time specified the mine will not be sold.

St. Louis, Mo.—The complaint of the Coal Operators' Traffic Bureau of St. Louis, the Southern Coal, Coke and Mining Co., the Lumaghi Coal Co. et al. vs. Chicago, Burlington & Quincy Ry. Co., alleging discrimination in soft-coal rate differentials as between southern Illinois mines and the Belleville group of mines, is set for hearing by the Interstate Commerce Commisison before an examiner in St. Louis on Nov. 26.

Washington, D. C.—Nearly all American by-product ovens are now equipped to produce coal tar bases, from which dyes may be manufactured. This has been due largely to the increased demand for these dyes since the European war started, but in the meantime, however, demand for the same bases to be used in the manufacture of explosives has kept prices so high that the dye stuff industry has been severely hampered.

Pittsburgh, Penn.—Although it is hoped there will be no strike of the miners in the anthracite region when the wage agreement expires next April, many large corporations are laying up a considerable supply of surplus coal. Among these is the Eastern Pennsylvania Railway Co., which has erected a trestle 400 feet long at Palo Alto where coal is being stocked. The scaffold is equipped with a scraper line running along the top which will carry the coal and dump it between the piers below.

Shamokin, Penn.—Two men while repairing a breast in the Hickory Swamp colliery recently were caught in a rush of coal and entombed for nine hours. The work of rescue was directed by R. J. Holland, superintendent of the operation, who worked with the rescue party in a space so small that the coal and refuse had to be removed in buckets. When the men were reached one was uninjured, but it was necessary to remove his companion to the hospital, as he had been bruised and lacerated by timbers.

Pittsburgh, Penn.—The towns on the Ohio River dependent on the Pittsburgh disrict for coal are facing a fuel shortage. For the first time in many years the river operators have announced that no coal was available for water shipment. Because of the industrial activity all the available coal is being used in local plants. Officers of the largest mining companies interviewed held out no hope of an early resumption of shipments to river points, although it was thought a few tows would go out next week.

Philadelphia, Penn.—The car supply in the bituminous trade has become so acute that one of the prominent shippers in this city has adopted a rather novel plan to urge prompt unloading by his customers. In each letter sent out a blotter is inserted, showing in glaring red type the following: "Keep the Cars Moving—Kindly release your cars immediately, regardless of the free time limit, and insist that the railroad move them promptly. This will help you and help our car supply. Short car supply means higher prices."

Louisville, Ky.—The coal-carrying trade has been taking a good deal of interest in the launching for the Inland Navigation Co., of New Orleans, at the Howard Shipyards, Jeffersonville, Ind., of the first of what is described as a fleet of 35 power barges, of large size, operated by oil engines and constructed of steel. The fleet is to be equipped electrically throughout, even to wireless apparatus, and it is said will operate at a rate about 75 per cent. of the rail rates, providing at the same time for transfer of freight from cars to barge, etc.

Philadelphia, Penn.—The case of James H. Minds and Julia A. Matz against the Pennsylvania R.R., in which they sue to recover $65,183.68 allowed them by the Interstate Commerce Commission for car discrimination, has been postponed until the February term. After spending three days in taking testimony a clerical error was discovered in the report from the commission. The error would have in no way affected the evidence and the judge suggested that it be corrected in court. The attorneys for the railroad, however, declined to agree and the case was then held over.

Whitesburg, Ky.—What are apparently well-founded reports are being circulated in this and adjoining counties to the effect that the Virginian R.R. is preparing to extend its line from a point near Bluefield, W. Va., through Buchanan, Va., and the Peter and Levisa Fork region of Pike County, terminating at Shelby Junction, on the Chesapeake & Ohio R.R., a distance of about 65 miles. This is one of the most extensive coal fields in the section now undeveloped. Engineers are reported to have completed the survey and it is expected that the contract will be let in the near future.

Jefferson City—The Missouri Public Service Commission, which recently granted the railroads of Missouri increases of 5 per cent. in freight rates on many commodities, refused the carriers' application for increases on hard coal, soft coal and fuel oil. The coal men also derive advantage from the commission's joint order ruling. The practice has been, when a shipment passed from one railroad to another, for the second road to make the same basic rate as if the shipment originated on that road. Under the joint order the road to which the shipment is transferred must carry it on at the rate which would have been charged for the distance by the road on which the shipment originated, if there had been no transfer.

Coal Trade Reviews

General Review

November anthracite tonnage about normal but the month was a distinct disappointment in the trade. Bituminous improved and little free coal available. Hampton Roads exports touch a new low point. Cold snap counteracts a slowing-up tendency in the Lake trade.

Anthracite—The month of November has been a distinct disappointment to the anthracite trade, although the tonnage statement will very probably show close to a normal movement. A sharp activity was anticipated, but this was dispelled by the mild weather which exerted a depressing effect. Some collieries have already been forced to suspend operation, due to inadequate car supply and a protracted spell of cold weather, such as marked the opening days of the current week, would clean up most of the surplus at the large distributing centers. It is noted that one road has already declared an embargo against all freight, except perishable. Further evidence of the concern felt over the impending wage conferences is noted in the surprisingly few bids received on some large municipal contracts which indicates the distinct hesitancy about commitments beyond Apr. 1.

Bituminous—The simultaneous resumption of activity at a number of industrial plants, together with a continuation of active operations at others, created a mild spurt in bituminous during the past week. Brokers are snapping up any loose tonnages that appear, while the available supply of free coal is steadily becoming more restricted and buyers are obliged to act quickly. The movement is becoming more and more confined to contracts on which shippers are steadily losing ground. The congestion of freight is adding to the seriousness of the situation. The increased demand has accentuated the car shortage, the supply now being a little better than 50% requirements, and this has had a notable tendency to firm up prices still further.

Exports—With the situation as regards ocean freights growing more acute every day, and scarcely any charters being negotiated, prospective exporters are gradually losing interest in the foreign business. There has been an increase in foreign inquiries during the past week, but as these invariably specify that the shippers shall provide vessels, the inquiries are receiving scant attention. The supply at exporting points continues substantially above normal, and the movement both coastwise and export is the source of no little disappointment. The dumpings over the Hampton Roads for last week touched the lowest point at any time since the boom in the export trade began.

Lake Market—There has been a slight tendency to slow down due to the approaching close of navigation and the uncertainty as to an outlet for the coal now going into the Lake trade, but the recent cold snap, accompanied by a snow flurry, together with the continued expansion in the steam consumption, have maintained the market in excellent shape. The car-supply question has now arrived at the point where some roads are being forced to declare temporary embargos against coal shipments in certain directions, until the line can be cleared and the congestion relieved. Inclement weather in the far Northwest has driven consumers into the market, with the result that there has been a notable increase in the shipments out from the upper Lake ports, while arrivals on the other hand have been seriously interrupted by severe storms.

Middle West—The colder weather has caused a sharp rush for coal, and the increased demand has been reflected all along the line back to the mines. Yards are heavily stocked, but the general demand has made a perceptible impression on the surpluses and dealers and jobbers are being gradually forced into the market. Prices are being sustained in the most impressive manner, and the first protracted cold snap will undoubtedly force quotations to new high levels on this movement. Northwestern points are showing renewed interest in the market, and a still heavier demand from the railroads for storage coal has had a stiffening effect on prices. In the few instances where orders are lacking, rigid curtailment is put into effect.

A Year Ago—The cold snap failed to precipitate the expected activity in anthracite. Some favorable developments in bituminous but still much pressure to move tonnage. High ocean rates restrict foreign shipping.

BUSINESS OPINIONS

Boston News Bureau—It is a rather peculiar situation. Reports from general trade continue favorable. There is a strong demand for commodities both from foreign and domestic sources. Prices of raw and manufactured products are advancing rather than declining. The activity has resulted in no impairment of money; in fact, the facilities are present for a much greater expansion of credit. Sterling exchange holds fairly firm, considering our enormous credit balances. Railroad earnings are commencing to feel the general business betterment. Looking for vulnerable spots, the most adverse feature is, of course, the war. Attention is closely riveted on the Balkan situation.

Dry Goods Economist—With conditions everywhere reported as strongly on the up-grade, retailers throughout the country are entering on the holiday season with decided optimism. There is every indication, indeed, that stores in every section will have an unusually good business, while in some centers it bids fair to be phenomenal. Orders with manufacturers and wholesalers, as is usual at this period, are of a filling-in character, though attention is being given to such new lines for spring as are now being offered.

American Wool and Cotton Reporter—Still strong with an upward tendency, the wool market is most emphatically a sellers' one. Prices continue to harden slowly. Standard Australian, grease, and foreign wools and in fact any regular grade meet with a ready market. A dealer in pulled wools sold a quantity during the week under review at the best prices of the season, and, in fact, during the same week, the best prices for all time. Dealers who have been holding territory wools are now realizing the profits on them. Manufacturers are beginning to realize that Boston is the cheapest market in the world.

Bradstreet's—Further progress in trade accompanies greater industrial activity, higher prices, better collections, increased demand for money, record bank deposits, sharp reduction in unemployment, heavier payrolls, a big movement of grain, and lower temperatures over a wide area, which latter has given snap to retail trade in seasonable wearing apparel. Rain has helped winter wheat, and cold weather far south has put a period to cotton growth. Final purveyors, short of goods as they are, and feeling certain of sustained growth in business, are buying freely from wholeale houses as well as from jobbers.

Dun—Fresh impetus to the forward movement is imparted by lower temperatures in many sections, which stimulate the demand for all classes of seasonable merchandise, notably clothing, footwear and fuel. As retail distribution quickens and broadens, wholesale departments in turn benefit and reports from all parts of the country are remarkably uniform in disclosing progressive improvement. Not only does business continue highly favorable in actual performance, but there is every promise, especially in industrial lines, of a degree of expansion limited only by facilities.

Marshall Field & Co.—Current wholesale distribution of dry goods is well ahead of a year ago—more seasonable weather being a factor in the increase. Road sales are heavy for immediate delivery, and are showing handsome increases for spring delivery. Customers have been in the market in about equal numbers to last year. Collections are improved. Merchandise is scarce in many lines, and prices are advancing.

The Southern Lumberman—While numerous price advances have been made by individual mills during the past week, especially on such stock as those particular mills happen to be short on, the general level of prices has remained practically at the advances announced last week, the only further increases being noted on No. 2 boards and in certain items of dimension. All car material has been in particularly good demand the past week, with especial call noted for decking. The market for hardwood lumber has shown no great change during the past week, the steadily increasing and well-distributed demand which has been noted for the past several weeks continuing.

ATLANTIC SEABOARD

BOSTON

Pocahontas and New River demand rather flat, although prices are more consistent. Boston, Mystic Wharf, price war still effective. Georges Creek in good supply, except all-rail. Most of Pennsylvania grades sold up for present. Water freights continue high. Delays beginning on anthracite.

Bituminous—There is no snap to the market on Hampton Roads coals. While a fair volume is coming forward on contracts there have been further accumulations at the loading piers on account of the slow movement of vessels. Car supply, too, on the Southern roads has been excellent. The demand for the smokeless coals seems to have flattened out the past fortnight or so, even the export trade failing to materialize. At the same time there are distributors in this territory who are behind on their orders, although not yet to the extent of chartering at current freight rates. Practically the only spot demand is among the shippers themselves, trading as they happen to be long or short for the time being. Prices show no change, although possibly the $2.85 f.o.b. basis for current sales is more consistently maintained than a month ago.

The Pennsylvania situation is developing faster than was expected. The shortage of cars has been given so much publicity that consumers everywhere have been trying to accumulate coal and with this extra demand at a time when most mines are getting only about 60% of the usual car supply, the operators have their hands full. Some of the larger consumers are getting apprehensive and early in the week there were such strong efforts to secure options in anticipation of a flurry that practically none of the shippers would take new business at any price. As high as $1.75 has been paid for fair grade Clearfields and there is every prospect of higher prices soon. One or two blocking snowstorms would make things look interesting.

Water Freights are nominal at $1.10, Hampton Roads to Boston, on large vessels, and very little tonnage available. It is felt the advance is due to those shippers who let their steamers go off-shore and now are obliged to replace them with other carriers. The flurry in coastwise rates therefore is a direct result of the high ocean freights that have prevailed all season.

Anthracite—The continued high winds have put the shipping companies behind on their orders, and from now on there will probably be delay in filling requisitions. The volume of bituminous coming forward from Philadelphia is curtailing the amount of barge tonnage available for anthracite from that port, and if retailers here had not been forehanded during the summer many of them would now be anxious over supplies.

Bituminous quotations, f.o.b. loading ports at points designated, are about as follows per gross ton:

	Philadelphia	New York	Baltimore	F.o.b. Mine
Clearfields	$2.40@2.85	$2.65@3.10	....	$1.10@1.75
Cambrias and Somersets	2.50@3.05	2.75@3.30	....	1.30@1.80
Georges Creek	2.92@3.02	3.22@3.32	$2.85@2.95	1.67@1.77

Pocahontas and New River prices, on cars Boston, are $3.65@3.83; Providence, $3.63@3.78; and f.o.b. loading ports at Hampton Roads, $2.80@2.85.

NEW YORK

Anthracite market active with good prices. Demand heavy and little coal at Tidewater. High grades steam coals scarce due to freight congestion. Dealers not bidding on city business. Bituminous situation bracing up. Higher prices looked for. Operators handicapped by car and labor situation.

Anthracite—There is considerable activity in the hard coal market both at Tidewater and on the line. While there has been no great delay in filling orders, shippers are becoming worried and a few days of weather similar to that in the early part of the week would clean up the little surplus now on the docks. All sizes are active and the high grade steam sizes are practically out of the market.

Shippers are anxious about getting coal forward, but the congestion on the railroads is holding everything back. One road has already ordered an embargo on all shipments excepting perishable freight and live stock.

That dealers are looking well into the future was demonstrated this week when bids were opened by city authorities for nearly 8,000 tons of hard coal. Only 11 bids were received, most dealers preferring not to commit themselves as to deliveries with the working agreement of the miners expiring on Apr. 1. Dealers in large tonnages of the steam sizes are hesitating about closing new contracts. One dealer quoted prices 15c. higher than those now existing and much to his surprise was accepted.

Shippers are practically selling from hand to mouth, but the situation is not as yet causing any serious trouble. Stove and nut sizes are the shortest and command slight premiums. Egg is the longest and stray lots have been quoted at from 5 to 10c. below company circulars. Pea is in good demand. Of the buckwheat coals, No. 3 is practically out of the market except some of the cheaper grades and these are bringing nearly full circular.

Current quotations, gross tons, f.o.b. Tidewater, follow:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$5.05		$5.10	
Egg	5.30	$5.20@5.30	5.35	$5.25@5.35
Stove	5.30	5.25@5.30	5.35	5.30@5.35
Chestnut	5.55	5.40@5.55	5.60	5.50@5.60
Pea	3.50	3.25@3.50	3.55	3.50@3.55
Buckwheat	2.75	2.25@2.75	2.80	2.25@2.80
Rice	2.25	1.85@2.25	2.30	2.00@2.30
Barley	1.75	1.50@1.75	1.80	1.75@1.80

Bituminous—Prices are on the up-grade and little coal, except the cheaper grades, can be had at less than $2.85 f.o.b., while the majority of the coals touched the $3 mark or more. There is a limited supply and buyers have to act quickly. Boats are scarce and freight rates are stiffening. Operators are doing their utmost to keep up with the demand, but their efforts are curtailed by the car and labor difficulties. The labor question is becoming more uncertain as the season advances and freight congestion is adding to the seriousness of the situation .

Mine quotations are stronger and $1.35 is about the lowest figure noted for low-grade coals. Line quotations are about 5c. less than at Tidewater. If temperatures continue low Tidewater quotations will be higher next week.

Current quotations, gross tons, f.o.b. Tidewater for various grades, are about as follows:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.20@3.30	$3.20@3.30	$3.20@3.30	$1.75@1.85
Georges Creek Tyson	2.95@3.00	2.95@3.00	2.95@3.00	1.40@1.45
Clearfield:				
Medium	2.80@2.85	2.80@2.85	....	1.25@1.35
Ordinary	2.75@2.80	2.75@2.80	....	1.20@1.25
Broad Top Mountain				1.25@1.45
Cambria County:				
South Forks	3.05@3.10	....	....	1.50@1.60
Nanty Glo	2.95@3.05	....	....	1.40@1.50
Barnesboro	2.80@2.90	....	....	1.30@1.35
Somerset County:				
Quemahoning	....	2.90@3.00	2.90@3.00	1.35@1.45
Medium	2.80@2.90	2.80@2.90	2.80@2.90	1.25@1.35
Latrobe	2.70@2.75	....	....	1.15@1.20
Greensburg	2.90@3.00	....	....	1.25@1.35
Westmoreland	3.20@3.30	....	....	1.45@1.55
West Virginia Fairmont ¾		2.70@2.80	2.70@2.80	.90@1.10
Fairmont mine-run		2.70@2.75	2.70@2.75	.90@1.00
Steam		2.70@2.80	2.70@2.80	1.15@1.25
Western Maryland		2.75@2.85	2.70@2.80	1.20@1.30

PHILADELPHIA

Warm weather affects anthracite, but good tonnage moving. Movement slow and short car supply closes some mines. Egg and nut slightly off. Stove well held and pea firm at $2.25. Bituminous active, but car supply short.

Anthracite—Business for November has been somewhat disappointing. Several weeks of mild weather is sure to have a depressing effect on the market, and both shippers and retailers have been annoyed at the slack business. Despite the fact that there has been no exceptional activity there has been much complaint of slow deliveries. In many instances coal has been in transit a week or more. When severe weather sets in and the real rush comes, there is sure to be trouble. Besides delays on the railroads, heavy orders from the consumers will be a tax on teams and motortrucks, with the added expense of extra help and late hours in the yards. The car supply became so acute this week that a number of collieries had to close down completely. One of the largest companies had six operations idle for half the week, with the prospect that a further shut-down would be necessary.

Confidential information is to the effect that it has been a distinct effort on the part of the retail men to keep their credits in high standing. But the dealers feel that the extra effort at this time will be well worth while in event of a suspension. If the state tax is finally refunded it will be more of a windfall than some would care to admit. Two lean years, including several cut-price campaigns have made profits dwindle most discouragingly. It is now understood that there is small probability of any of the refund being made before a year or more at the least. It will take six months for the court to act on the request for a rehearing and if it is then allowed it will take a year to re-submit the case.

Broken, as usual, is being well cared for. Egg coal is moving in fair volume, although several sales are noted at from 15c. to 25c. below regular circular. While stove coal is still in demand the rush on this size has slowed down for the time being. Chestnut has been weaker and in some instances has been sold to the larger buyers at a slight reduction, including tax off. Pea coal has undeniably stiffened and no new orders are being taken at less than $2.25 and tax. Of course this does not in any way affect the big business which is protected up to Jan. 1 at $2 and tax. The time is rapidly approaching when the dealers who are now selling this size at $4.50 and $4.75 in their customers' cellars will see what a poor business proposition it is to sacrifice their advantage in buying.

The circular prices per gross ton at mines and for the tide shipments f.o.b. Port Richmond are as follows:

	Line	Tide		Line	Tide
Broken	$3.50	$4.75	Pea	$2.50	$3.25
Egg	3.75	5.00	Buckwheat	1.50	2.25
Stove	4.00	5.00	Rice	.85	1.75
Chestnut	4.15	5.25	Barley	.50	1.50

Bituminous—The trade was given a decided impetus this week, due apparently to a simultaneous resumption at a number of industrial plants. The sudden spurt served to accentuate the difficulty of the car supply, and on account of the inability to fill orders the prices on all grades naturally showed an increase, with one or two exceptions.

Prices per gross ton, f.o.b. mines, are as follows:

Georges Creek Big Vein	$1.75@1.85	Fairmont gas, ¾	$1.35@1.45
South Fork Miller Vein	1.55@1.65	Fairmont gas, mine-run	1.20@1.25
Clearfield (ordinary)	1.40@1.50	Fairmont gas, slack	1.00@1.05
Somerset (ordinary)	1.35@1.45	Fairmont lump, ordinary	1.15@1.20
West Va. Freeport	1.25@1.30	Fairmont mine-run	1.05@1.10
		Fairmont slack	1.00@1.05

BALTIMORE

Car supply still below 66%. Vessels scarce. Restricted sales and growing demand send prices upward.

With a car supply in Western Maryland, Pennsylvania and West Virginia during the past week that averaged about 60% of actual requirements, shippers fell behind still farther on contract obligations the past week. The Thanksgiving holiday helped the railroads to catch up somewhat on the movement.

Slow deliveries are beginning to tell on the anthracite trade. There is also a growing belief that a strike is inevitable in the spring. It would not be at all surprising to see an advance in prices above what is the usual high winter rate. While yard supplies are still fair, a cold wave would soon wipe out the better part of this reserve.

Prices in gross tons to the trade may be quoted about as follows:

	Mines	Balt.*
Geo. Crk. Big Vein	$1.80	$2.98
Geo. Crk. Tyson	1.50	2.68
Clearfield	1.30	2.48
South Fork	1.45	2.63
Latrobe	1.25	2.33
Somerset (best)	1.40	2.58
Somerset (good)	1.25	2.43
Quemahoning	1.45	2.63
Freeport	1.20	2.28
Miller Vein	1.30	2.38

Fairmont	Mines	Balt.*
Ordinary mine run	$1.00	$2.38
Ordinary ¾	1.10	2.53
Ordinary slack	1.00	2.43
Low sulphur mine-run	1.25@1.30	2.68@2.73
Low sulphur ¾	1.40	2.83
Low sulphur slack	1.00@1.05	2.43@2.48

* F. o. b., outside Capes.

HAMPTON ROADS

Export shipments light. Government takings fair. New Custom House ruling concerning bunkering.

Coal shipments from tidewater have not been as heavy as expected, both as regards export and coastwise movement. The government, however, has taken a fair quantity, having loaded two large colliers and a quantity of coal for bunkers. The coastwise movement, as usual, has gone to the New England ports, the largest amount going to Boston and Providence, with other fair shipments to Salem, Fall River, Pawtucket, Lynn and Plymouth.

The accumulation at tidewater is still above normal, although a number of shippers with large contracts to take care of have at times during the week been short. The largest portion of the coal moving has been Pocahontas and New River mine-run, with some few cargoes of nut and slack and high volatiles. Of the high volatile coal, there is only a small amount on hand, but there is little demand for this grade in any case.

Notice has been received by local shippers that after Nov. 17 vessels calling at this port for bunker coal only would not be compelled to enter and clear at the Custom House unless remaining in port more than 48 hr. This notice will be of great assistance to shippers where steamers arrive after Custom House hours and will mean a great saving in time to the owners of the vessels.

Railroad Tonnages—Dumpings over the local piers for the past five weeks compare as follows:

	Week Ending				
Railroad	Oct. 23	Oct. 30	Nov. 6	Nov. 13	Nov. 20
Norfolk & Western	163,920	126,145	120,590	133,329	100,598
Chesapeake & Ohio	81,517	74,028	78,210	70,282	67,209
Virginian	51,304	78,237	46,952	72,888	39,485
Totals	296,741	278,410	245,752	276,499	207,292

Ocean Charters, Clearances and Freights

OCEAN CHARTERS

The following charters have been reported from various sources during the past week·

PHILADELPHIA

Vessel	To	Tons	Rate
F. Luckenbach	Havana	1,926	
A. W. Robinson	Mayport	423	1.15
E. Anderson	Halifax	211	
Sonora	Cienfuegos	1,186	
M. R. Bohannan	Mayport	579	1.15
W. Booth	Lynn	435	1.00
C. Water	Rosario	2,362	
Ocland	Martinique	1,874	
Andreta	Mediterranean		
S. Gaspara	Mediterranean		
Inca	Mayport		

BALTIMORE

Vessel	To	Tons	Rate
Turbinia	River Plate	1,998	
Kennebec	Galveston	1,913	
Marguerite	Jucaro	1,475	
Bygland	Preston[1]	1,464	
Delawanna	Mayport	2,000	

[1] And Banes

VIRGINIA

Vessel	To	Tons	Rate
R. Palmer	Buenos Aires	2,125	
C. Accame	Port Militar	2,504	11.28

VESSEL CLEARANCES

The following steamers have cleared from various ports during the week ended Nov. 20:

NORFOLK

Vessel	Destination	Tons
Denis[1]	Para	1,847
Genova[2]	Savona	4,946
Messicano[2]	Naples	3,261
Tabor[3]	Curacao	5,400
Cesare[2]	Bagnoli	4,900
H. Palmer[3]	Lisbon	2,500
M. E. Palmer[3]	Buenos Aires	1,978
Europa[4]	Vera Cruz	

NEWPORT NEWS

Vessel	Destination	Tons
O. J. Olsen[5]	Port au Spain	2,151
H. T. Scott[5]	Cuba	1,829
Hermod[6]	Barbados	4,472
Oaxaca[5]		1,387

PHILADELPHIA

Vessel	Destination	Tons
P. Stetzer	Mayport	2,000
Claveresk	Antilla	2,441
G. E. Warren	Bangor	
Cocalico[7]	E. Cambridge	
Draper[7]	E. Boston	
B. Ridge[7]	Boston	
Logan[7]	Portland	
Hammond[7]	Hallowell	
Exeter[7]	Bangor	
Tulpehocken[7]	Augusta	
Wiconisco[7]	Bangor	
Phoenix[7]	Bangor	
Alf	Barrios	
Manatawny[7]	Hallowell	
Cleona[7]	Boston	
Mahanoy[7]	Boston	
Barry[7]	Commercial	
B. Ridge[7]	Boston	
Enterprise[7]	Everett	
Farmand	S. la Grande	1,901
Petra	Port Limon	

PHILADELPHIA—Continued

Vessel	Destination	Tons
Langhorne[7]	Boston	
Kimberton[7]	Portland	
Pennypack[7]	Augusta	
Beechwood[7]	Brookline	
Oak Hill[7]	Portland	
Molinol[7]	Portsmouth	
W. Booth	Lynn	825
Thelma	Sagua	
F. Luckenbach	Havana	1,926
E. R. Hunt	Arroyo	1,926
Saucon[7]	Salem	
Thomaston[7]	Malden	
Glendower[7]	E. Cambridge	
Ontelsunee[7]	Boston	
Robesonia[7]	Dorchester	

BALTIMORE

Vessel	Destination	Tons
Marionga	Italy	5,136
Margueritte	Cuba	2,516
Oceano	Bognoli di Napoli, Italy	5,400
Turbinia	Buenos Ayres	4,300
Sangstead	Honduras	650

NEW YORK

Canada		480
Argentina		48
Irland		320
Canada		1,323
Costa Rica		10
Canada		748
Venezuela		30
Trinidad		495
England		11
Duitch West Indies		2
Italy		50

[1] Chesapeake & Ohio C. & C. Co. [2] Pocahontas Fuel Co. [3] Castner, Curran & Bullitt, Inc. [4] Baker Whiteley. [5] Berwind White. [6] Smokeless Fuel Co. [7] Phila. & Reading Coal and Iron Co.

OCEAN FREIGHTS

The freight situation grows more acute daily, and although we occasionally charter a steamer for export coal, it is more than difficult to secure tonnage even at the high rates now current.

We would quote freight rates on coal by steamer as follows:

To	Rate	To	Rate
Havana	$2.75@3.25	Bermuda	$3 50@ 4.00
Cardenas or Sagua	3.00@3.50	Vera Cruz	5.00@ 6.00
Cienfuegos	3.25@3.75	Tampico	5.00@ 6.00
Port au Spain, Trinidad	4.00@4.50	Rio	10.80@11.40
St. Lucia	4.00@4.50	Santos*	11 40@12.00
St. Thomas	3.50@4.00	Montevideo	12.00
Barbados	4.00@4.50	Buenos Aires or La Plata†	12.00
Kingston	3 50@4.00	Rosario	13.20
Curacao	4.00	West Coast of Italy	19.20@20.40
Santiago	3.50@4.00	Barcelona**	18.00@19.20
Guantanamo	3 50@4.00	Valparaiso or Callao	11.00@12.00
Demerara	6.00@7.00	Marseilles	19.20

* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British steamers; neutral steamers are more difficult to obtain and the rates are always higher.

W. W. Battie & Co.'s Coal Trade Freight Report.

LAKE MARKETS

PITTSBURGH

Domestic demand improved. Operations at 75% with fair labor supply and more car shortages. Stock of slack small. Scarcity of Lake vessel tonnage for 1916 predicted.

Domestic demand has improved materially with colder weather and is now about normal. Line demand shows no material improvement, while railroad consumption is a trifle heavier.

Car shortages are still more in evidence and more or less of a congestion is likely in the next few weeks, until cars tied up in the Lake trade are all returned. There has been no noticeable softening in the market by reason of the approaching close of Lake shipments, but the market is certainly not stronger, except as to slack, which is scarce already and is likely to have to be made by crushing before the winter is over. Some stocks have been accumulated at mines, but far less than the usual quantities. Labor supply is fair and operations are at about 75% of capacity.

We quote free coal as follows: Slack, 85@95c.; mine-run, $1.15@1.20; ¾-in., $1.25@1.35; 1¼-in., $1.35@1.45; contract coal, to Apr. 1: Slack, 90c.@$1; nut, $1@1.10; mine-run, $1.15@1.25; ¾-in., $1.20@1.30; 1¼-in., $1.30@1.40, all per net ton at mine, Pittsburgh district.

While it is taking a far look ahead, it is of interest to note that the iron industry expects a very heavy movement of iron ore down the Lakes next season, limited only by the capacity of the fleet, and it is stated in iron ore circles that an unusual proportion of the boats will go up the Lake light, so that there may be difficulty in moving coal. Already a great deal of vessel tonnage has been chartered for ore.

BUFFALO

General dullness in bituminous, but it is not expected to last. Anthracite varies with the weather. Lake closing will form new basis.

Bituminous—The trade has been dull for a week or so though almost everybody regards this as a temporary condition. At the same time the approaching end of the Lake season has the usual influence; when the shipments to the Lakes stop there will be a large amount of additional coal, with slack leading, thrown on the market. It is quite possible that some of the Lake shippers have already anticipated the situation and sent their surplus this way. Other dealers who are extensive operators deny that the dullness amounts to anything and report that they are short of coal. The car shortage is still increasing and should there be an early period of snowy weather there are indications of a runaway market.

Prices are not so strong as they were a week ago, though not declining:

	Pittsburgh	Allegheny Valley	Penn Smokeless
Lump	$2.80	$2.50	$2.55
Three-quarter	2.65	2.30	.....
Mine run	2.55	2.20	2.30
Slack	2.15	1.90	2.30

Quotations are f.o.b. cars at Buffalo or the Niagara bridges and per short ton except east of Rochester or Kingston, Ont.

Anthracite—The trade is very unsteady, on account of the continued return of mild weather; when it snows the demand is good, but it falls off just as soon as the sun comes out. Independent jobbers find it easy to get standard prices, but hard to get the coal. The car shortage has much to do with this. Anthracite shippers are decidedly uneasy over the tax complications and look for troublous times before the matter is straightened out. Some of them did not pretend to add the tax to their prices and claim they are exempt from any refund. Prices remain strong as follows: Grate, $5.60; egg and stove, $5.85; chestnut, $6.10; pea, $4.30; buckwheat, $3.25, per long ton, f.o.b. cars, or with 25c. additional for delivery on board vessel. Prices include the Pennsylvania state tax.

Lake shippers of anthracite are anxious to continue till the end of navigation, but though the fleet is large here, on account of the great amount of grain arriving, coal rates are advancing. Tonnage to Lake Michigan is difficult to get at any rate. Lake shipments for the week were 104,750 tons. Shippers will remain in the market till the end of the season.

TORONTO, CAN.

Colder weather helps the trade. Navigation practically closed.

The colder weather has resulted in an increased demand for anthracite. Dealers are keeping large stocks on hand in view of an anticipated rise in prices, so that the car shortage does not materially affect present conditions. Large consumers have been urged to prepare for increased prices and delayed deliveries by stocking up more freely, but as a rule prefer to buy only for immediate requirements. Navigation has practically closed for the season and only few more consignments will be received by water. Slack continues much in demand.

Quotations per short ton for best grades are: Retail, anthracite egg, stove and nut, $7.75; grate, $7.50; pea, $6.50. Bituminous, retail steam, $5.25; screenings, $4.25@4.50; domestic lump, $6; cannel, $8. Wholesale, f.o.b. cars at destination, three-quarter lump, $3.79; screenings, $3.15.

COLUMBUS

More strength in domestic lines, due to lower temperatures. Steam trade is still good and the market is generally satisfactory. Prices firm all along the line.

With the coming of colder weather, dealers are having a better trade, which is reflected upon the operators by larger orders. Generally speaking, retail stocks are not large and a little movement forces the dealers into the market. Many orders are accompanied with requests for immediate shipment.

Orders for steam tonnage are also gradually increasing as manufacturing continues to expand. Railroads are buying more and producers believe that demand will continue to improve. Prices all along the line remain strong and there are some indications of an advance shortly.

The Lake trade is coming to a close. There is still about a week for the shipment of stocks to the Northwest, but the time is limited. The season on the whole was not as active as previous years, althought a considerable tonnage was shipped to the head of the Lakes.

Retail prices are firm and all changes are toward higher levels. The contract season is expected to open with a rush shortly after the first of the year, as many contracts expire about that time. The car shortage which has been delaying shipments is apparently growing worse. Many shippers look for a real stringency in cars in the near future.

Prices in Ohio fields f.o.b. mines, per short ton, are as follows:

	Hocking	Pomeroy	Eastern Ohio	Kanawha
Re-screened lump	$1.60	$1.65	.....	.....
Inch and a quarter	1.50	1.50	$1.35	$1.50
Three-quarter-inch	1.35	1.40	.....	1.35
Nut	1.25	1.30	.....	1.25
Mine-run	1.15	1.20	1.05	1.10
Nut, pea and slack	.70	.75	.65	.60
Coarse slack	.60	.65	.55	.50

Mines have been working at about the following percentages of full capacity:

District	Week Ended				District	Week Ended			
	Oct. 30	Nov. 6	Nov. 13	Nov. 20		Oct. 30	Nov. 6	Nov. 13	Nov. 20
Hocking	65	60	50	60	Cambridge	65	70	70	75
Jackson	50	45	40	45	Massillon	70	70	70	75
Pomeroy	90	85	85	85	Eastern O.	80	80	75	80
Crooksville	65	65	65	65	Average	69	68	65	69

TOLEDO

Insurance protection on Lake boats expires Dec. 10. Ohio mines operating well. Market stiffening.

Business, especially among the retail yards, has been better, owing to the colder weather. There has been no change in prices, although all lines are holding a little more firmly to the list than has been the case. Pocahontas has been inclined to be a little soft in the prepared sizes, although there is a fair general demand. West Virginia has been much stronger so far as steam lines are concerned, although the domestic grades have shown some weakness. There is a marked stiffening on slack, which is in strong demand and small supply. There is much complaint here of car shortage and the late Lake trade has been greatly retarded owing to the difficulty experienced in securing sufficient cars to move the coal.

The Lake season is nearing its close, as insurance on Lake-going vessels will expire Dec. 10. The Lake trade on coal has been fairly strong despite fears early in the season that the business would be light. Late fall trade has been good and an immense amount of coal has been handled at the Toledo docks.

Reports from Sandusky state that a rush of coal to the north began several weeks ago, but has been interrupted recently by severe storms. A number of coal boats due at the Pennsylvania docks in that city were held up this week due to that cause.

DETROIT

Better conditions in the steam coal trade. Cold weather brings more sales of domestic and anthracite. Vessels scarce in Lake trade.

Bituminous—Improvement in demand for steam coal is noted. Although the buying is not greatly increased, the orders are more regular than during the last few weeks. Lack of adequate railroad equipment is causing a silght delay in deliveries. Despite the announcement of a temporary embargo, some of the shippers fear it will be lifted only to be renewed.

Frosty weather, snow and cold rain have imparted a stimulating influence to the domestic trade. Retailers are doing a larger business and shippers look for renewal orders soon. Very little consignment stock is now coming to forced sale.

Anthracite—Consumers of anthracite are still buying somewhat cautiously, although colder weather has braced up the market. Retail stocks seem to be holding out well, as the shippers are getting only a small amount of new business.

In the Lake trade, shippers are having much trouble getting vessel capacity, as carriers have lost so much time recently in storms that they are running behind on ore and grain schedules.

CINCINNATI

Colder weather has increased domestic demand and inquiries are heavier. Car supply becoming tighter and a shortage of fuel is predicted.

The coldest weather of the season has caused a marked increase in the demand for domestic coal and brought the retailers into the market in considerable numbers. With the totally inadequate car supply this increased demand has accentuated the relative scarcity of fuel, and from now on the demand is very likely to run considerably ahead of the supply. Prices are stiffening daily, although in some cases quotations have little reference to actual movements, because of the inability of some of the mines to make deliveries. The turn in the market has apparently come, and consumers who have delayed buying will probably find that they waited too long.

LOUISVILLE

Lower temperatures stimulate domestic business. Prices stronger.

Arrival of cooler weather has helped the Kentucky market considerably, especially on domestic coals. Steam sizes have been very much in demand for the last several weeks and prices are advancing. Sales for the week, long-ton basis, f.o.b. mines, have been recorded at from $1.75 to $2.10, with $1.85 a price prevailing on a considerable proportion. Nut and slack is selling at from 50c. up. There is said to be virtually none of the low grades on the market.

COKE

CONNELLSVILLE

Prompt furnace coke still easier. Contract business practically all closed. Foundry coke steady with fair demand. Production and shipments slightly heavier.

The market for furnace coke for spot or prompt shipment has weakened further. Demand was light at the close of last week and is no better this week. Operators have in several cases accumulated fair surpluses, which they are holding as well as they can. Production appears to be heavier, as the men are working well to accumulate some Christmas money, and consumption is not increased. It appears that if there is to be any shortage of coke it will fall in January rather than before Christmas. Fannie furnace, West Middlesex, Penn., has gone into blast, and McKeefrey at Leetonia, O., is to blow in shortly, but it is understood both furnaces are covered for coke. Corrigan, McKinney & Co. have contracted for the remainder of their coke for 1916 and with this business and that of the Youngstown Sheet and Tube Co., reported last week, out of the way there is hardly any more contract business, to be done.

Foundry coke is in fair demand, perhaps in better demand than a fortnight ago. There is no rush to cover on contracts for the first half of 1916, as operators advanced prices before buyers showed much interest and the buyers now feel they can do as well later in the year as now. We quote: Prompt furnace, $2.15@2.25; contract furnace, first half, $2.35@2.50; year, $2.25@2.35; prompt and contract foundry, $2.90@3.15, all per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Nov. 13 at 427,381 tons, an increase of 3,219 tons, and shipments at 430,503 tons, an increase of 4,410 tons.

Buffalo—The trade is brisk and prices firm. Many ovens are sold to capacity. There is practically no stock coke offering, except some ovens that are selling a little 48-hr. product as stock. Best 72-hr. foundry sells at $5 up.

Columbus—There is an increasing demand for coke and prices are advancing.

Chicago—Coke continues to be in urgent demand, with jobbers and dealers selling all they can obtain at high prices. Gas house and byproduct sizes are strong, and there does not seem to be enough foundry coke available for this territory. Much higher prices are predicted. Prices per net ton of 2,000 lb. f.o.b. cars Chacago, are as follows: Byproduct, foundry, $5.50@5.75; byproduct domestic, $4.75@5; Connellsville, $5.50; Wise County, $5.25@5.50; gas coke, $4@4.25.

MIDDLE WESTERN

GENERAL REVIEW

Colder weather stimulates interest. Domestic coals easy. Steam buying stronger. Eastern coals spotty.

A substantial drop in the temperature has brought about increased buying in domestic coals, though these sizes are not moving as rapidly as anticipated; but undoubtedly they will gain momentum if seasonable weather continues. Yard sales have been brisk, and if the low temperature continues wholesalers will soon be very active replenishing stocks. Yards are heavily stocked, but these stocks have decreased perceptibly during the last few days.

The demand for steam coals has improved with prices firmer. Some of the railroads are taking more storage coal, which stiffens the steam market. Screenings have strengthened generally, the advance being from 10c. to 15c. per ton. Shortage of labor, and lack of cars becomes more acute with every snow flurry. Northwestern lines have issued orders to prevent their cars from going East.

In the Northwest a fair demand exists, but there is not the snap to the trade which undoubtedly will be found later when real winter arrives. Nebraska and far Western points have shown indications of renewed buying. Shipments to Chicago from Indiana and Illinois mines have been below normal the last ten days. Prices of all grades of Western coals are maintained in an unprecedented manner, and even with the accumulations of the past two weeks no concessions of any consequence have followed. Curtailment of production is the rule where lack of orders exists.

INDIANAPOLIS

Touch of colder weather causes an increase in demand for domestic lump. Screenings prices higher. Steam grades being stored. Industrial demand grows.

The weather has been a little sharper and the movement of domestic coal has been much improved. The recent mild weather, and consequent reduced output of domestic coal, apparently cleaned up any surplus screenings and these are now selling stronger. The larger companies report that they are selling Nos. 5 and 6 at not under 70c. in the open market, f.o.b. mines, with 85c. the minimum for No. 4, mine-run averages about $1.10 for Nos. 5 and 6, and No. 4 about $1.15; 1¼-in. steam lump sells up to $1.35 and domestic lump at $1.50 to $1.60.

The car shortage is still troublesome and is curtailing the output. Operators believe they already observe a tendency to store on the part of the steam consumers, in anticipation of the biennial wage conference. The increased operation of factories is spreading. Retailers are not able to say whether there will be any advance Dec. 1 as has been customary for many years, except during the last two or three winters.

CHICAGO

Smokeless softer. Anthracite improves. Southern Illinois screenings strong at higher prices. Indiana coals maintain their position.

Diminished production of Franklin, Williamson and Saline County mines has increased the price of screenings at least 10c. per ton. Operators are still dumping fine grades of coal on the ground instead of sending it to the markets, thus releasing equipment without forcing declines. Nut, pea and slack continue stronger than at this time last year. Domestic lump has been quiet up to the last two days, when orders commenced to arrive more freely.

Springfield screenings have not been sold below 60c., and lump coal is held firmly at $1.75. Increased orders during the last few days of the week have helped the situation materially, and the railroads are reported to be taking storage coal in large quantities from this field.

Car shortages are reported at Indiana mines, averaging a loss of one operating day per week from this cause. The storage supply of retail coal in Indiana cities is unusually low, the big industrial consumers depending mostly on daily shipments, and the yard stocks much less than usual. Knox County mine-run and screenings have been strong; Clinton and domestic lump and screenings have been in steady demand, but steam lump quiet. Sullivan and Greene County domestic lump have had a much better demand the last three days of this week owing to colder weather.

Pocahontas and New River smokeless coals have been softer, with lump selling as low as $1.60, and egg in a somewhat better position. Mine run is generally being sold close to list price. Pennsylvania smokeless coals are scarce and sell strictly at schedule, owing to continued car shortages. Kanawha splint lump is steady.

The average prices quoted on Kentucky 4-in. block are from $1.85 to $2.05; mine-run 95c. to $1.10. Fine coal and slack is strong, and egg is running about $1.50.

The anthracite demand is improving, and shipments now reaching this center about keep pace with orders.

Quotations in the Chicago market are as follows:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump	$1.65@1.75	$1.65@1.75	$1.50@1.60	$1.35@1.50	$1.40@1.55
Steam lump	....	....	1.15@1.30	1.25@1.35	1.25
2½ and 3-in. lump	....	....	1.40@1.50	....	1.30@1.40
1¼-in. lump	1.25@1.35	1.25@1.35	1.30@1.35	1.15@1.25	....
Egg	1.50@1.75	1.65@1.75	1.10@1.20	1.10@1.20	1.15@1.25
Nut	....	1.60@1.65	1.00@1.10	.95@1.05	1.00@1.10
No. 1 washed	1.75	....	1.50	....	....
No. 2 washed	1.40@1.50	....	1.40	....	....
No. 1 nut	1.65@1.75	....	....	....	....
No. 2 nut	1.40@1.50	....	....	....	....
Mine-run	1.10@1.15	1.05@1.10	.85@ .95	.95@1.00	.85@1.05
Screenings	.60@ .75	.60@ .65	.50@ .65	.55@ .65	.75@ .80

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.60@1.75	$1.85@2.25	$1.65@2.25	$1.90@2.25	$1.50@1.60
1¼-in. lump	1.25@1.30	1.35@1.65	....	....	....
Egg	1.50@1.65	1.35@1.60	1.90@2.25	1.75@2.00	....
Nut	....	1.15@1.55	1.60@1.75	1.40@1.60	1.30
No. 1 nut	1.60@1.75	....	....	....	....
No. 2 nut	1.50	....			....
Mine-run	1.10@1.15	.95@1.15	1.25@1.40	1.25@1.40	1.15@1.25
Screenings	.60@ .70	.60@ .70	....	....	.70@ .75

W. Va., Splint Lump, $1.50@1.60.

ST. LOUIS

Colder weather sustains the market at a critical moment. Outlook regarded as optimistic.

A touch of winter moved what coal there was on track and held the prices steady just when there seemed danger of a break. The dealers kept their eyes on the thermometer and the forecasts and did not stampede. The first sustained cold spell will create a strong demand and force prices up.

Quotations f.o.b. mines during the past week have ranged on the following basis per short ton:

	Frnk. Co.	Wlmson. Co.	Staunton	Standard
6-in. lump	$1.50@1.75	$1.50@1.75	$1.25@1.35	$1.20@1.25
8-in. lump	....	....	....	1.25
2-in. lump	....	....	1.15@1.20	1.00@1.10
3x6 egg	1.40@1.75	1.40@1.65	....	1.00
2x6 egg	....	....	....	.80@.85
No. 1 nut	1.50@1.75	1.50@1.75	....	.80
No. 2 nut	1.40@1.50	1.40@1.50	....	.60
No. 1 washed	....	1.65	1.50	....
No. 2 washed	....	1.25	1.10@1.25	....
No. 3 washed	....	1.25	1.10@1.25	....
No. 4 washed	....	1.20	1.05	....
No. 5 washed	....	.60@.70	.50@.60	....
Screenings	.60@.65	.60@.65	.30@.35	.30@.35

Freight Rates—Inner group, St. Louis, 57½c.; East St. Louis, 37½c. Outer group, St. Louis, 72½c.; East St. Louis, 52½ cents.

DULUTH

Demand is steady. Season of navigation is almost over. Dealers and consumers beginning to stock.

There has been a material growth in shipments and the demand for all grades has increased. The householder and retailer has turned his attention to the coal bins and finds that a large number of the grades were missing, hence the shipments to country dealers and to retailers at interior points were quite heavy during the past week. Receipts have been light, the storms that have prevailed over Lake Superior for the past week having interfered greatly with arrivals. Prices remain firm, the circular being well maintained, this being especially so of the prepared sizes. The railways absorbed a fair tonnage during the week all of which was moved to storage plants at interior points. Quotations are as follows:

	Yough	Splint	Hock	Smokeless	Elkhorn
Lump	$3.40	$3.40	$3.40	$4.75	$3.75
Dock run	3.10	3.10	3.10	3.25	3.25
Stove or nut	3.40	3.40	3.40	4.75	3.65
Screenings	2.40	2.50	2.22	2.75	2.40

Colder weather during the past week has given an impetus to the movement of anthracite and all the dock companies report a brisk inquiry for this class of fuel. Quotations per short ton f.o.b. Duluth are as follows: Nut, $7.10; egg and stove, $6.85; pea, $5.55 and buckwheat, $4.

PRODUCTION AND TRANSPORTATION STATISTICS

CHESAPEAKE & OHIO RY.

The following is a comparative statement of the coal and coke traffic from the New River, Kanawha and Kentucky districts for September and the three months of the fiscal years 1914 and 1915, in short tons:

	September				Three Months			
Destination	1915	%	1914	%	1915	%	1914	%
Tidewater	425,526	20	384,246	19	1,414,506	22	985,701	17
East	201,715	9	227,959	11	554,378	9	608,893	10
West	1,360,630	63	1,241,932	62	3,971,960	61	3,898,894	66
Total	1,987,871		1,854,137		5,940,844		5,493,488	
From Connections								
Bituminous	175,087	8	149,628	8	513,395	8	414,845	7
Anthra. (local)	467				605			
Anthracite	1,487		2,526		4,475		5,270	
Total	2,164,912	100	2,006,291	100	6,459,319	100	5,913,603	100
Coke	30,366		13,439		77,336		59,653	

VIRGINIAN RAILWAY

Total shipments of coal over the Virginian Ry. for September, amounted to 393,055 tons, which compares with 411,090 tons for the previous month and 361,906 tons for September of 1914.

NORFOLK & WESTERN RY.

The following is a statement of coal handled by the N. & W. Ry. during October and the past four months in short tons:

	July	August	September	October
Pocahontas Field	1,648,551	1,721,573	1,620,362	1,720,613
Tug River District	361,454	337,585	354,981	375,743
Thacker District	265,743	227,312	230,198	264,619
Kenova District	80,009	80,152	89,921	95,438
Clinch Valley District	146,911	151,804	144,234	142,187
Other N. & W. Territory	2,651	4,239	3,798	4,636
Total N. & W. Fields	2,505,319	2,522,665	2,443,494	2,603,236
Williamson & Pond Creek	86,949	89,785	87,152	95,188
Tug River & Ky. R.R.	....	....	....	60,050
All other railroads	262,177	348,124	324,913	268,762
Grand total	2,854,445	2,960,574	2,855,559	3,027,236

Distribution of shipments for August and September follows:

	August			September		
	Shipped	Tipple	Total	Shipped	Tipple	Total
Pocahontas	1,599,007	12,439	1,611,446	1,499,081	12,870	1,511,951
Tug River	337,585	2,830	340,415	354,981	3,015	357,996
Thacker	227,312	7,172	234,484	230,198	5,753	235,951
Kenova	80,152	9,819	89,971	89,921	9,586	99,507
Total	2,244,056	32,260	2,276,316	2,174,181	31,224	2,205,405

Shipments of coke entirely from the Pocahontas field amounted to 59,253 tons in August and 55,971 in September.

PENNSYLVANIA RAILROAD

The following is a statement of shipments over the P. R.R. Co.'s lines east of Pittsburgh and Erie for October of the current year and the ten months of 1914 and 1915, in short tons:

	October		Ten Months	
	1915	1914	1915	1914
Anthracite	1,084,739	1,047,340	8,687,790	9,067,445
Bituminous	4,304,466	3,976,192	35,983,366	37,840,834
Coke	1,225,848	716,010	9,604,424	8,277,868
Total	6,615,053	5,739,542	54,275,580	55,186,147

FOREIGN MARKETS

GREAT BRITAIN

Nov. 12—Conditions remain generally quiet and there is no indication of an early improvement. Quotations are approximately as follows:

Best Welsh steam	Nominal	Best Monmouthshires	$4.32
Best seconds	Nominal	Seconds	4.20
Seconds	$4.32	Best Cardiff smalls	2.52
Best dry coals	5.64	Cargo smalls	1.68

The prices for Cardiff coals are f.o.b. Cardiff, Newport or Barry, while those for Monmouthshires descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—Outward chartering is more active, but tonnage is still inadequate. Rates are approximately as follows:

Gibraltar	$6.96	Naples	$10.80	St. Vincent	$7.20
Marseilles	9.84	Alexandria	12.00	River Plate	9.60
Algiers	9.07	Port Said	12.00		
Genoa	10.80	Las Palmas	6.24		

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

✚Indicates contracts regarding which official information has been received.

Recast

In the following table we give a list of all old contracts coming up for consideration during the ensuing week. The table gives our contract number, the name of the purchaser, city, tonnage and page on which the detail notice appeared:

No.	Purchaser	City	State	Tonnage	Page
1503	A. H. Andrews Co.	Chicago	Ill.	6,000b	736
1601	City Government	Cameron	Mo.	3,000a	736
1604	American Malting Co.	Chicago	Ill.	60	737
1636	Keystone Fibre Co.	Chester	Penn.		870

a Indicates anthracite coal. b Indicates bituminous. [1] Per day.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

1547—Fremont, Ohio—Only one bid was received on this contract (p. 617), which provides for furnishing the Public Service Department with various grades of bituminous coal in carload lots during the ensuing year. This bid was irregular and could not be considered. Nothing further has been done concerning the contract. Address Clk. Ralph R. Williams, Dir. of Pub. Ser., Fremont, Ohio.

✚1619—Pleasantville, N. J.—Samples of coal have been ordered on this contract (pp. 787, 870), and the award will be made according to quality. The contract provides for furnishing the County Board with approximately 200 tons of Lehigh Valley pea and 150 tons of stove. Address Supt. T. L. McConnell, Pleasantville, N. J.

No. 1633—New York, N. Y.—Bids on this contract (p. 829) calling for 7,995 gross tons of anthracite coal and 1,590 gross tons of mine-run coal for six city departments were opened in Room 1230 Municipal Building on Nov. 22. There were 25 points of delivery as follows:

	Zone 1[1]	Zone 2		Zone 7[2]	Zone 8[3]	Zone 9[4]	Zone 11[6]
Tons	150	Buck.	Bit.	600	800	470	150
Wm. Farrell & Son..........	$3.45	.....	.....	.....	.....	.....	.....
Bacon Coal Co.	3.38	.....	$3.45	$4.90	$5.40	.....	.....
Pattison & Bowns.......	.....	$2.93	3.93	.....	.....	.....	.....
C. H. Reynolds & Sons.......	.....	.....	.....	3.25	.....	.....	.....
Gavin Rowe....	.....	2.58	3.82	3.44	.....	.....	.....
Jameson & Bond Co.....	.....	.....	.....	.....	.....	.....	$7.85

Zone 17[3]

	Class "A"					Class "B[5]"
Tons	700	500	200	500	500	200
John E. Donovan.......	$4.05	$4.00	$4.40	$4.25	$3.90	$7.10
Jos. Johnson's Sons......	4.04	3.95	4.35	4.20	3.85	7.25
Gavin Rowe...........	1.91	3.99	4.29	3.91	3.66	.....
S. Haber..............	.....	.....	.....	.....	.....	7.29

Zone 18

	Class "A"				Class "B"		
Tons	1,200[1]	600[6]	300[4]	125[1]	40[6]	1,000[1]	250[6]
Wm. Farrel & Son..........	.....	.....	$3.99	$2.80	$3.75	$2.12	$3.75
Pattison & Bowns.......	$2.57	$3.57	.....	.....	.....	.....	.....
Gavin Rowe....	2.32	3.56	.....	.....	.....	.....	.....

Zones 1-17 Inclusive[6]

Tons	100	75	150	50	25
F. M. A. Leach.................	$6.85	$6.85	$7.20	$8.10	$7.35
S. Haber...................	.....	.....	.....	.....	6.95

[1] Buckwheat No. 3. [2] Buckwheat No. 2. [3] Buckwheat No. 1. [4] Pea. [5] Stove. [6] Mine-run.

For detailed description of zones see Contract 706, Vol. 7, p. 915. Address Central Purchasing Committee, Room 1126 Municipal Bldg., New York, N. Y.

New Business

1653—East St. Louis, Ill.—The Granby Smelting and Mining Co. at this place will soon call for bids on their annual contract involving approximately 200 tons of 1½-in. screenings per week, and 700 tons of 2-in. or 3-in. nut coal. The screenings are for use in boilers and the nut coal for gas producers. Address Supt. Ross Boles, Granby Smelting and Mining Co., East St. Louis, Ill.

1654—Chester, Penn.—The Chester Tube Co., at this place usually contract for their annual fuel requirements about Jan. 1. Deliveries are made by Philadelphia & Reading Ry. Address Pur. Agt., F. W. Cook, Chester Tube Co., Chester, Penn.

1655—Chester, Penn.—The Chester Brewing Co., at this place usually contract for their annual fuel requirements involving about 600 tons on Jan. 1. Address Purchasing Agent, Chester Brewing Co., Chester, Penn.

1656—Clifton Heights, Penn.—The Caledonia Woolen Mills at this place usually contracts for their annual fuel requirements about Jan. 1. Address Purchasing Agent, Caledonia Woolen Mills, Clifton Heights, Penn.

1657—Chicago, Ill.—The Sefton Manufacturing Co. at this place will soon be in the market for their annual fuel requirements involving approximately 4,000 tons. The company uses either Franklin County or Carterville 2-in. screenings and the contract will cover the period ending Nov. 1, 1916. Deliveries will be in approximately equal monthly proportions. Address Pur. Agt. R. H. Clenny, Sefton Manufacturing Co., 1301 W. 35th St., Chicago, Ill.

1658—Camden, N. J.—J. Eavenson & Son, Incorporated, usually contracts for its annual fuel requirements, involving approximately 4,000 tons, the last of the year. Address Pur. Agt. Roland M. Eavenson, J. Eavenson & Son, Inc., Camden, N. J.

1659—Eddystone, Penn.—The Tindell-Morris Co., usually contract for their annual fuel requirements about Jan. 1. Deliveries are made by Pennsylvania R.R. Address Purchasing Agent Christen Tindell-Morris Co., Eddystone, Penn.

1660—East St. Louis, Ill.—The Obear-Nester Glass Co. at this place is testing out No. 2 screened nut coal from various mines preparatory to placing the contract for their power plant, involving about 120 tons per week, for the coming year. The contract for furnishing the company's gas producer with about 325 tons of 3x2-in. nut coal per week, was recently awarded to the Wickham Coal Co. Address Supt. Jos. Nester, Obear-Nester Glass Co., East St. Louis, Ill.

1661—Norristown, Penn.—The Adam Scheidt Brewing Co. usually contract for their annual fuel requirements about Jan. 1. Deliveries are made by Philadelphia & Reading Ry. Address Purchasing Agent., Adam Scheidt Brewing Co., Norristown, Penn.

1662—Wapakoneta, Ohio—The Wapakoneta Electric Light and Water Works at this place will be in the market Jan. 1 for their annual requirements of coal involving approximately 4,000 tons of mine-run Houston Thacker coal. The approximate cost is about $2.35 per ton delivered in the shed and the business is done on competitive bids. Address Supt. Harry Nagel, Wapakoneta Electric Light and Water Works, Wapakoneta, Ohio.

1663—Buena Vista, Colo.—The State Board of Corrections of this place will receive bids until 9 a.m., Dec. 13, for furnishing approximately 300 tons of mine-run steam coal for the Colorado State Reformatory. Address Pres. E. B. Wicks, State Bd. of Correction, Buena Vista, Colo.

1664—Atlantic City, N. J.—The Hotel Dennis at this place will be in the market on Jan. 1 for their annual fuel requirements involving about 4,000 tons of anthracite buckwheat coal. Address Purchasing Agent, Hotel Dennis Co., Atlantic City, N. J.

1665—Sioux Falls, Iowa—The Cudahy Packing Co. are considering covering their requirements until Apr. 1 of next year with a contract. About 100 tons of Carterville or Franklin County 2-in. screenings per day will be required. Address Pur. Agt. P. A. Moody, Cudahy Packing Co., Chicago, Ill.

1666—West Chester, Penn.—The Sharpless Separator Co. at this place usually contract for their annual fuel requirements, involving approximately 2,500 tons of anthracite buckwheat and pea coal, about the first of the year. Address Purchasing Agent Sharpless Separator Co., West Chester, Penn.

1667—Ironton, Ohio—The Director of Public Service will receive bids until noon, Nov. 30, for furnishing and delivering coal to the local pumping station as may be required during the year beginning Dec. 1. Bids must be accompanied by a certified check for $100. Address Clk., F. A. Ross, Bd. of Pub. Ser., Ironton, Ohio.

1668—St. Louis, Mo.—The St. Louis Car Co., at this place, is now conducting tests on No. 2 nut coal (unwashed), preparatory to placing a contract for their annual requirements, involving approximately 125 tons weekly. The coal is for use at the company's power house. Address Pur. Agt. E. B. Meissner, St. Louis Car Co., St. Louis, Mo.

1669—Sioux Falls, S. D.—It is understood that the South Dakota Ry. Co. will soon place a contract involving approximately 1,000 tons per month of southern Illinois 6x1½-in. egg coal, for delivery up to Mar. 31 of next year. Address H. S. Stebbens, South Dakota Central Ry. Co., Sioux Falls, S. D.

1670—Ft. Wayne, Ind.—The Evans Coal Co. at this place is in market for a prompt tonnage of West Virginia nut and slack coal for delivery up to Jan. 1. Address The Evans Coal Co., Ft. Wayne, Ind.

1671—Grand Haven, Mich.—The Eagle-Ottawa Leather Co. at this place is receiving bids for their annual coal requirements, involving approximately 100 tons of West Virginia mine-run coal. Deliveries are to be completed during next year, and will be required at the rate of about two cars per week. Address Gen. Mgr. Wm. Hatton, The Eagle-Ottawa Leather Co., Grand Haven, Mich.

1672—Madison, Ill.—The Barber Asphalt Paving Co. of this place will contract about Dec. 1 for a supply of lump and screenings to last them until Apr. 1 of next year. About 30 tons per day will be required, and bidders must be prepared to state if they will be able to supply the company's requirements when the prospective shut down appears next spring. Quotations should be f.o.b. terminal tracks at the Madison City plant of the company. For notice of previous purchase of this company, see contract 494, Vol. 7, p. 665. Address Pur. Agt. White, Barber Asphalt Paving Co., Madison, Ill.

+1673—Muncie, Ind.—The City Government at this place is receiving bids on from 600 to 700 tons of West Virginia three-quarters lump coal for use at the local garbage plant. The contract will probably be let to one of the local dealers. Address City Clerk, Muncie, Ind.

+1674—Erie, Penn.—The City Government at this place will advertise for bids about Dec. 15 to supply the local garbage plant during the next year. For notice concerning the announcement of the bids on the current contract see contract No. 61, Vol. 7, p. 189. Address Supt. Frank E. Pelow, Dept. of Parks and Pub. Property, Erie, Penn.

+1675—Winnipeg, Manitoba, Can.—Bids will be received during the early part of next year for furnishing the greater Winnipeg Water District with steam coal during the ensuing 12 months. From 3,000 to 5,000 tons of lump coal having a heat value of not less than 13,000 B.t.u., will be required. Deliveries are to be as ordered f.o.b. Paddington Transfer, St. Boniface. For previous notice concerning the current contract, see contract No. 82, Vol. 7, p. 375. Address Chn. S. H. Reynolds, 901 Boyd Bldg., Winnipeg, Manitoba, Can.

1676—Peru, Ind.—The contract for furnishing the Miami County Bldg. at this place with approximately 600 tons of coal will be let about Dec. 1. The business is usually let to one of the local dealers. Address City Clerk, Peru, Ind.

1677—Chicago, Ill.—Sealed proposals will be received until 11 a.m., Nov. 29, for furnishing and delivering coal for the following departments in various sections of the city. Each division, as listed in the following, is a separate contract, and the deposit required to accompany each bid is given:

	Department			
	Fire	Health	Street	Police
District No. 1	$500	$100	$100	$100
District No. 2	500	100	100	100
District No. 3	600	200	100	100
District No. 4	800	100	100	100
District No. 5	500	...	100	100

PUMPING STATIONS

Central Park Ave.	$2,200	Chicago Ave.	$2,000
Sewage pumping stations	100	Twenty-second St.	1,900
Harrison St.	700	Sixty-eighth St.	2,200
Springfield Ave.	2,000	Rogers Park	200
Lake View	2,200	Roseland	1,200
Fourteenth St.	2,200		

MISCELLANEOUS

City Hall Building	$900
Bureau of Engineering	100
Bridges and Harbors	200
Naphtha Storage Tanks	125

For previous bids and awards on this contract see Vol. 7, pp. 488, 666, 748.

Address Comr. of Pub. Wks. L. E. McGann, Room 406, City Hall, Chicago, Ill.

1678—Philadelphia, Penn.—The Hahnemann Hospital at this place consume approximately 3,000 tons of buckwheat coal per annum, for which they usually contract about Jan. 1. Address Secretary, Hahnemann Hospital, Broad and Race St., Philadelphia, Penn.

1679—New York, N. Y.—The Dept. of Public Works will receive bids until 2 p.m., Dec. 3, for furnishing, delivering, storing and trimming coal for use of the various public buildings, courts, etc., in the Borough of Manhattan, as follows: 3,000,000 lb. buckwheat No. 1; 20,000,000 lb. buckwheat No. 2; 2,000,000 lb. of buckwheat No. 3; 1,200,000 lb. of broken coal; 3,500,000 lb. of bituminous mine-run. Deliveries are to be completed by June 30, 1916, and the successful bidder will be required to furnish a bond for $15,000. For announcement of bids on the current contract see contract 19, Vol. 6, p. 892. Address Pres. Marcus M. Marks, Room 2032, 20th floor, Municipal Bldg., New York, N. Y.

1680—Philadelphia, Penn.—Geo. P. Pilling & Son, manufacturers of surgical instruments, at this place, usually contract for their annual fuel requirements, involving approximately 2,500 tons of white ash buckwheat coal, about Jan. 1 of each year. Address Purchasing Agent George P. Pilling & Son, 23rd and Arch St., Philadelphia, Penn.

1681—Philadelphia, Penn.—The Spreckels Sugar Refining Co. at this place usually contract for their annual fuel requirements, involving approximately 20,000 tons of buckwheat coal, about Jan. 1. Address Treasurer, Spreckels Sugar Refining Co., Foot of Reed St., Philadelphia, Penn.

+1682—Crosby, N. D.—The Divide County Commissioners will receive bids until 2 p.m., Nov. 29, for furnishing coal as may be required at the court house, jail and sheriff's office during the year beginning Jan. 1. No. 1 screened lump lignite is required. All bids must be accompanied by certified check for $50. Address County Audr. W. E. Vadnais, Crosby, N. D.

1683—Bozeman, Mont.—The Gallatin County Board of Commissioners will receive bids until 2 p.m., Dec. 8, for furnishing approximately 100 tons of good lump coal to the local court house and jail, and coal as may be required by the county poor. Address Clk. E. H. Schumacher, Gallatin County, Bozeman, Mont.

1684—Salt Lake City, Utah—The Board of Education at this place received bids until noon Nov. 19 for furnishing approximately 5,000 tons of slack and 500 tons of lump and nut coal to be delivered in the bins of the various school buildings as may be required during the school year ending June 30, 1916. For a previous notice regarding this contract see p. 114. Address Clk. L. P. Judd, Bd. of Edu., Room 202 City and County Building, Salt Lake City, Utah.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

+1323—New York, N. Y.—This contract (p. 367), which provides for furnishing and trimming between 9,000 and 25,000 tons of coal into dredges during the period ending Sept. 30, 1916, has been awarded to the **Commercial Coal Co.**, the gross consideration being $57,630. Address U. S. Engineers' Office, Room 707, Army Bldg., 39 Whitehall St., New York City.

+1404—New Orleans, La.—This contract (pp. 408, 576), which provides for furnishing the New Orleans Cotton Exchange with its winter supply of coal, has been awarded to the **Tennessee Coal and Iron Co.** on Pratt coal. Address Pur. Agt. Plauche, New Orleans Cotton Exchange, New Orleans, La.

+1438—New Orleans, La.—This contract (pp. 490, 660), which provides for furnishing the Interstate Bank and Trust Co. with its annual fuel requirements, involving about 200 tons of coal, has been awarded to the **C. A. Andrews Coal Co.** at $3.30 per ton. The new price represents an increase of 15c. per ton over the old contract. Address Pur. Agt. J. W. Billingsley, Interstate Bank and Trust Co., New Orleans, La.

1470—Minnewaukan, N. D.—This contract (p. 531), which provides for furnishing and delivering about 150 tons of lignite coal to the County Court House, has been awarded to the **Andrews Grain Co.** at $2.15 per ton for the best grade screened lignite. Address Aud. W. E. Paulson, Benson County, Minnewaukan, N. D.

1504—New Orleans, La.—This contract (p. 577), which provides for furnishing the Swiss Steam Laundry at this place with approximately 200 tons of steam coal, has been awarded to the **C. A. Andrews Coal Co.** Address Pur. Agt. L. P. Hakenjose, Swiss Steam Laundry, 1010 Gravier St., New Orleans, La.

COAL AGE

Vol. 8 NEW YORK, DECEMBER 4, 1915 No. 23

The Important Question

Written Expressly for COAL AGE

By Berton Braley

ANOTHER year's swiftly approaching its close
And Christmas time comes as the fleeting year goes;
The children come home for the annual spread
And spirits are gladdened and bodies are fed.
No matter if purses aren't fearfully fat,
Don't mutter and grumble and kick about that,
Be merry—but question yourselves now and then:
"*What kind of a Christmas is this for* MY MEN?"

You've plenty to eat and you've plenty to wear,
You've comfort and warmth and a little to spare,
But how about those who have labored for you,
Who've toiled in the workings the weary year through?
Are they spending Christmas in cottages neat
Or huddled in hovels disgracing the street?
Is the town like a town—or a grimy-walled pen?
"*What kind of a Christmas is this for* Your Men?"

Has Christmas brought some of them hunger and want?
Is poverty stalking them, ugly and gaunt?
It isn't your fault? Well, perhaps it is not,
And it may not be theirs; can't you brighten their lot?
Won't you see that at least for one day in the year
Their homes and their hearts shall be brimming with cheer?
It isn't a matter of how things have been
But—"*What sort of Christmas is this for* YOUR MEN?"

We're wishing you joy and prosperity, too,
May all sorts of fortune come rolling to you;
But mingled with all of your luck we shall trust
That providence teaches you how to be just—
Yes, just to yourselves and to workers whose lives
Are spent in their labor for children and wives,
Be just—and this question won't worry you then,
"*What kind of a Christmas is this for* YOUR MEN?"

Ideas and Suggestions

Benefits of Prohibition

By George N. Lantz*

In the efforts made to promote temperance or to bring about prohibition greater stress is laid on the economic loss to the drinking class than formerly.

In the recent unsuccessful attempt to prohibit the sale of liquor in Ohio efforts were made to show that the taxes, license fees, and expenses of all sorts of the breweries and saloons were paid by the men who drink and that the consumer pays the bills. The "drys" also endeavored to show the results that would accrue from a proper expenditure of the money spent on drink. Similarly in "Pages from a Miner's Notebook" (*Coal Age*, Vol. 8, p. 756) the writer treats of the saloon evil from the standpoint of dollars and cents. After Jim Bates, the regular customer of the saloon keeper, was incapacitated for his employment he discovered that he had no funds to tide him over his difficulties and became a charge for his more thrifty neighbors.

The writer might have gone farther and related a common occurrence in many mining communities, or in fact in any labor center, for the saloon evil affects other kinds of labor than mining.

During times of temporary idleness, strikes, wage adjustments and dull business, the intemperate class regardless of their physical fitness for work often become a burden for the more thrifty element, who as a rule look after the unfortunate families of the drinking element by making donations of food, clothing, fuel and sometimes money.

Another Use for Liquor Money

As to what might be accomplished by another use of the money that finds its way across the bar let me set down the views of a certain railway employee speaking of a mining village of about 2,000 population—a village with which I am familiar.

Said this railway man, "I've been on this run for 20 years, and in that time there has never been a Monday morning when the brewers' agent of this town has sent less than $2,000 to the breweries and at times it reached $4,000. This represents the brewers' share of the profit of the saloon. If the people of the town were wise, they'd keep that money at home and every week someone could put up a $3,000 home."

We will be more conservative than the railway employee and say $2,500 homes. Also we will say that only one-half is spent by residents of the town, the other half coming from the surrounding neighborhoods and from transients, and we will build a home every two weeks instead of every week. Then on the supposition that there are 325 families in the village, we find that in a little over thirteen years every family could be living in a home valued at $2,500 or have that amount in the bank.

It is certainly a more agreeable picture to contemplate a village of 325 homes, none of them costing less than $2,500, than the large number of poorly kept, unpainted shacks that are seen there today.

I have intentionally confined my remarks to the money side of the liquor question in this letter, though much can be said from the standpoint of morality, hygiene, safety, etc.

⁂

How Efficient Is Your Patch?

By N. G. Near

Mentally, we are all imperfect. We must admit it. We are continually saying to ourselves, "If I only knew how to do such and such a thing, I would be all right."

Sometimes we make a half-hearted effort to learn how to do that thing. Sometimes we make a really earnest effort, and as a result we actually learn how the thing is done.

This is equivalent to "putting a patch on our brain," and the thoroughness with which we learn determines the efficiency of the patch. A patch on a boiler that decreases steam leakage 10 per cent. is better than no patch at all, but it is far from perfect. Nor is a patch perfect that permits 1-per cent. leakage. That is why we always aim to make patches on steam pipes and boilers 100 per cent. efficient.

Applying this logic to ourselves, why are we so often satisfied with a 50-per cent. patch on the brain? Why 90 per cent.? Should we ever fall short of 100 per cent.?

"Well," you may say, "there should be no patching to do. We should learn one thing after the other in logical sequence."

That sounds very fine, but it is almost impossible to learn methodically. As we continue to live we learn by "jumps," and we therefore leave behind us many little "gaps" in our education that should not exist. These are the gaps that need patching. When patching time comes, therefore, let us do the job right.

⁂

Pivotal Position in a Coal Mine

By Forney L. Parker*

In a coal mine the boss who comes in closest contact with the miner is the assistant foreman, and on whether he is efficient in his daily duties of handling the men depends in a large measure the success of the mine organization.

He must be thoroughly conscientious and faithful in the performance of his duties, and to do this he must have a definite idea of every man's work and his daily progress. This requires not only the necessary daily examination of the working faces before the miners arrive for their day's shift, but also the essential visit while the men are at work. It is during this second visit that the miner should be instructed to do the necessary work in the proper manner, and if the employee does not follow the instruction of his superior officer he should be disciplined accordingly.

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*New Straitsville, Ohio.

*Joliet, Penn.

The obedience of the men must be gained by kindness and getting their confidence rather than by inspiring fear in them. When the employee disobeys he should be punished, and at the time the penalty is imposed be sure that he knows just what he is being punished for.

There Should Be a Fixed Standard

There should be a standard for the various "stunts" performed in the mining and transportation of coal, and the assistant must see that they are done accordingly and are accomplished in a standard time.

When a new man is employed he should be instructed to perform his duties in the easiest, safest and quickest way, and not be allowed to pick up the wrong methods as practiced by the man who held the job before him or by his present "buddy."

Let your men work out the minor details of the job in their own way, for by giving them responsibility you get better results than you do by constant supervision.

All of the assistants at a mine should pull together, and they should try to improve the spirit and ideals of the mine worker. The mine foreman cannot watch the different sections of the mine as closely as his assistants, and both must depend largely upon the honor of the employee for the fullest performance of work.

In issuing an order or proposing new work the safety of the miner is of first consideration, and if the policies which are here set forth are carried out, it will eventually lead to the greater efficiency and safety of the miner and result in winning the maximum quantity of coal from the mine.

The Boiled-Shirt Job

The reason for the preponderance of foreign population about the coal mines today is the unwillingness of Americans to do the rough work connected with the mining industry. The skilled miner of yesterday sent his son to school, and college if possible, to the end that he might have an easy life—that he might land a "boiled-shirt job."

The young American coal miner is rare today. The place vacated by him in the mines has been taken by the foreigner. And now the immigrants' sons are in turn looking for a job that will enable them to be dressed up all of the time.

It is the old failing of false pride—the belief that there is something demeaning in manual labor. The old saying that "clothes do not make the man" is mighty true when applied to the men of the coal-mining industry. Many a young fellow is working for a starvation salary in an office when he could be earning twice as much in the mine. And the mines need these young men. Without them our miner of tomorrow will again be the ignorant immigrant from foreign shores with his constant need of supervision.

Back-to-the-Mines Movement Is Needed

We have recently had a back-to-the-farm movement sweeping the country. What the mining industry needs is a back-to-the-mines movement for these young fellows who could become skilled miners. There is not room for all at the top, and whether being at the top is wearing a white collar or digging coal in the mines is only a matter of personal opinion.

There is a real opportunity for every young man in the mine. The professions are crowded; superintendents, engineers and clerks are plentiful. Only a few are rising, while many are standing still, and very seldom is the compensation commensurate with the work and responsibility assumed.

On the other hand the skilled miner is in demand. While he has not received much recognition in the past, a better time is coming for him. As our method of mining in the future will be one of concentration, the skilled miner will be singled out from the riffraff that fill our mines today.

There are respect, good wages and plenty of work for the skilled coal miner of tomorrow, while the hazards of his work will be reduced to a minimum.

An Interesting Letter

The following letter will appeal to many coal-mine managers as representative of conditions at their own plants. The general sense of the letter might be absorbed to advantage by the under officials at many mines. The letterhead and names in the letter have been changed to disguise its origin.

NORTH AMERICAN COAL AND COKE CO.
Operating Department

Chicago, Ill., Nov. 13, 1915.

Mr. Henry Porter, Supt.,
Carbon City Mines.

Dear Sir: Immediately on receipt of your letter of Nov. 6, I wrote a circular letter to all of the other superintendents of the company asking them if they had in their employ an assistant electrician competent to take charge of the electrical work at your plant. All the replies received were very similar—they had men who had had sufficient experience, but they hesitated to recommend them because they did not know whether they would make good as bosses.

For a long time I have had in mind the advisability of writing a circular letter to all of our superintendents bearing on the very point raised by these letters, and now that the superintendents themselves to a man have pulled down the bars, I will no longer hesitate—I'll make a circular letter of this.

As I see it, gentlemen, the highest service that a superintendent can render his company is manifested when he develops a system that obtains from each employee the best that he is capable of. When a superintendent has in mind such a purpose it seems to me that he must always have more electricians and boss drivers and firebosses and weighmen waiting for a chance than the company could use in a hundred years.

Everyone realizes that the world is full of square pegs in round holes, but how many are competent to change these misfits around? I'll answer my own question by saying, Master pilots only, and I'll go a little further while my courage is up and remark that the "Big Boss," as you call him, seems to be the only one who can measure up to the test, and he'll prove it by calling attention to the fact that every one of his superintendents privileged to read this came up from his ranks. Why?

Some of you were engineers, some were mine foremen and still others chief clerks, but I thought I saw higher talent in each one, and you haven't disappointed me very much. Now sit you down, every last one of you, while your dander is up and write me a frank letter telling me just how I have misjudged you, and as a sort of postscript put down the names of some fellows you have your eyes on right now.

It's a pleasure to help others, especially when the others are a bit appreciative; please don't forget that, and also don't forget that I still have my eyes on every one of you—perhaps I need an understudy. Yours very truly,

CARLETON E. DAVIS,
General Manager.

Mine-Hoist Calculations

By F. L. Stone*

SYNOPSIS—The first of a series of articles bearing on this subject. The case of an unbalanced slope hoist is considered, each successive step in the calculations being exemplified.

The object of this and succeeding articles is to set before the mine operator a clear and concise method for the solution of the majority of hoisting problems. Various conditions of hoisting will be considered and the same method of solution applied. The only knowledge required to intelligently follow the various steps is a clear understanding of the fundamental laws governing mechanics and motion.

There are numerous methods used by engineers for calculating hoist cycles, but the moment method, while perhaps a little longer than some others, is almost universal in its application and the simplest arithmetic is employed in the final solution. This method will be used throughout.

GENERAL VIEW OF 700-HP. HOIST AT CROWS NEST MINE OF KEYSTONE COAL AND COKE CO.

The following cases will be considered and solutions worked out in detail.

1. Slope haulage, unbalanced.
2. Slope haulage, balanced.
3. Shallow shaft, balanced.
4. Shallow shaft, unbalanced.
5. Shallow shaft, unbalanced, with counterweight.
6. Deep shaft, balanced.
7. Conical drums.
8. Odd-shaped drums.

For the sake of simplicity each case will be illustrated by an example worked out in detail, the examples being selected from actual mining conditions.

CASE 1. UNBALANCED SLOPE

Length, feet	2,000
Tonnage in 8 hr.	2,800
Percentage of grade	6
Cars per trip	40
Rest at top, minutes	3
Rest inside, minutes	3
Weight of coal per car, tons	2
Weight of car, tons	1½

To assure tonnage, calculations are based on securing the entire output of the mine in 7 hr.

$$\text{Trips per hour} = \frac{2{,}800}{2 \times 40 \times 7} = 5.$$

$$\text{Time of round trip} = \frac{3{,}600}{5} = 720 \text{ sec.}$$

Total rest top and bottom per trip = 360 sec.

Running time up and down = 720 — 360 = 360 sec.

$$\text{Running time one way} = \frac{360}{2} = 180 \text{ sec.}$$

If the speed were constant throughout the running, the velocity in feet per second would be $\frac{2,000}{180}$, but during acceleration and retardation the average velocity is only one-half the running velocity because the load starts at zero speed and ends at V speed during acceleration, and during retardation it starts at V and ends at O.

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*Power and mining engineering department, General Electric Co., Schenectady, N. Y.

Let

D = Total distance traveled;
V = Running velocity;
t_a = Time of acceleration;
t_r = Time of retardation;
T = Total running time of trip.

Then the space passed over during acceleration $= \frac{Vt_a}{2}$ and during retardation $= \frac{Vt_r}{2}$ and the distance passed over at full speed $= D - \frac{Vt_a + Vt_r}{2}$.

The time of full speed running $= T - (t_a + t_r)$.

$$V = \frac{D - \frac{(Vt_a + Vt_r)}{2}}{T - (t_a + t_r)}$$

$$V(T - (t_a + t_r)) = D - V\frac{(t_a + t_r)}{2}$$

$$V(T - (t_a + t_r)) + \frac{(t_a + t_r)}{2} = D \qquad V = \frac{D}{T - \frac{t_a + t_r}{2}}$$

Assume that t_a = 20 sec. and t_r = 10 sec. Then

$$V = \frac{2,000}{180 - 15} = 12.1 \text{ ft. per sec.}$$

Such a load as described would require a rope 1⅜ in. in diameter, and this size of rope should not be coiled on a drum of a diameter less than 7 ft., which gives a ratio of rope diameter to drum diameter of slightly over 1:60. If the drum is 7 ft. in diameter, each convolution will contain approximately 22 ft., and there will be about 91 turns in all. This would be wound in two layers. To be absolutely accurate the change in diameter due to the second layer being wound on top of the first should be taken into account. This is of such small importance that it will not be considered in the present problem. All calculations will be made on the basis of a constant drum diameter of 7 ft. The drum will therefore make $\frac{2,000}{7 \times \pi}$ turns = 91.

MOMENT VALUES SHOULD BE PLOTTED

It will be well to plot the values of the individual moments on a cross-section sheet as soon as calculated, using the vertical scale for moments and the horizontal scale for turns.

It must be borne in mind that percentage of grade as given in coal-mine work is in reality the sine of the angle which the slope makes with the horizontal, and the rope pull due to the weight alone is W times this sine.

Weight of up-load = (4,000 + 3,000) 40 = 280,000 lb.

Effective weight (or rope pull) = 280,000 × 0.06 = 16,800 lb.

Moment at zero turns (start) = 16,800 × 3.5 = 58,750.

Moment at 91 turns (finish) = 16,800 × 3.5 = 58,750.

Rope of 1⅜ in. in diameter weighs 3 lb. per ft.
Effective weight = 3 × 2,000 × 0.06 = 360 lb.
Moment at zero turns = 360 × 3.5 = 1,260.
Moment at 91 turns = 0.
Rolling friction = 35 lb. per ton.

If the angle the slope makes with the horizontal is greater than 8° (14%), then the effective weight on the track will be found by multiplying the weight by the cosine of the slope angle. If, however, as in the case under consideration, the angle is less than 8° the cosine is so close to unity it may be considered as such and the entire weight assumed as being normal to the track.

$$\frac{280,000}{2,000} = 140 \text{ tons}$$

140 × 35 = 4,900 lb. rolling friction.

Moment due to rolling friction:
Zero turns = 4,900 × 3.5 = 17,150.
At 91 turns = 4,900 × 3.5 = 17,150.

Rope friction is one of the most variable quantities to be contended with in slope haulages. The conditions of the rollers and their spacing play an important part. However, experience has shown that 200 lb. per ton of normal pressure seems a safe figure. The remarks in regard to the pitch of the slope and the cosine of its angle apply to the rope as well as to the load. Therefore

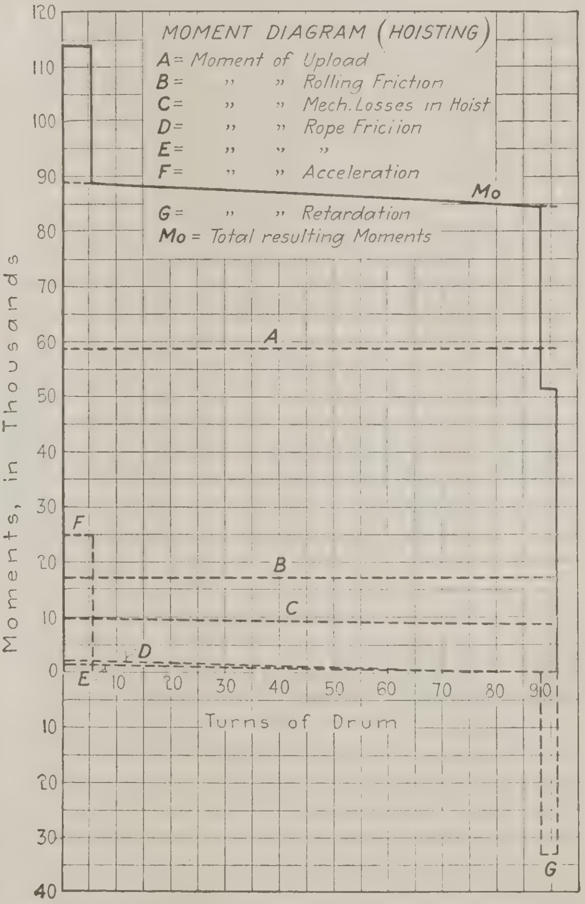


DIAGRAM OF MOMENTS DURING HOISTING

$$\frac{2,000 \text{ ft.} \times 3}{2,000} = 3 \text{ tons}$$

3 × 200 = 600 lb. rope friction at start.

Moment of rope friction:
Zero turns = 600 × 3.5 = 2,100.
At 91 turns = 0 × 3.5 = 0.

SUMMATION OF MOMENTS

	Turns 0	Turns 91
Up-load	58,750	58,750
Rope	1,260	0
Rolling friction	17,150	17,150
Rope friction	2,100	0
Total moments	79,260	75,900

The assumption of the proper percentage to be used for the losses in the hoist itself is a subject on which few or no reliable data can be found. The question becomes more complicated in the case of balanced hoists where the ratio between the total mass moved in the shaft or slope and the mass of coal or ore hoisted is much greater than in unbalanced haulages such as the one being considered. It is obviously incorrect to assume a percentage of the net moments without regard to total weight on the drums. Such assumptions can easily be reduced to an absurdity by considering a balanced shaft with both cages loaded. The net moment is zero and any percentage of this value would be zero.

In the case under consideration, however, it will be safe to assume 80 per cent. as the efficiency of the hoist proper from motor shaft to rope. Other cases will be discussed later.

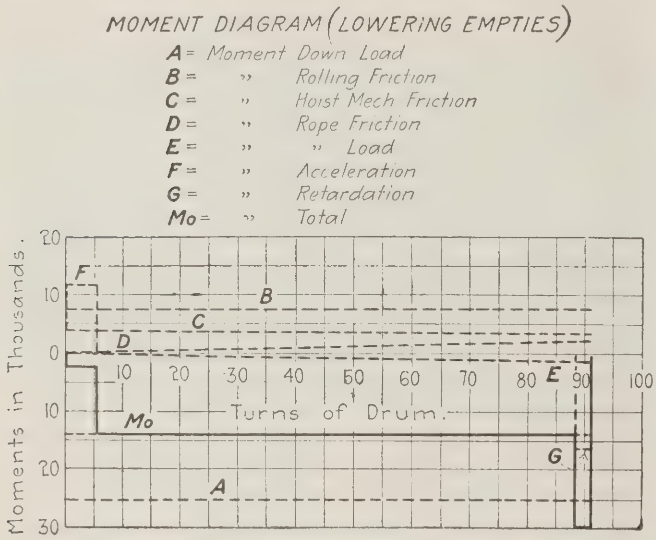


DIAGRAM OF MOMENTS WHILE LOWERING EMPTIES

Friction moment at zero turns:

$$\frac{79,260}{0.80} - 79,260 = 9,740$$

At 91 turns the moment is

$$\frac{75,900}{0.80} - 75,900 = 8,700$$

Total net moments exclusive of acceleration and retardation:

	Turns 0	Turns 91
Total, less friction	79,260	75,900
Mechanical friction	9,740	8,700
	89,000	84,600

The problem is now completed with the exception of determining the moment due to accelerating and retarding the entire mass. For easy reference the following fundamental equations applying to mass and motion are recorded:

$$M = \frac{w}{g} \qquad (1)$$

$$v = a \times t, \text{ or } a = \frac{v}{t} \qquad (2)$$

$$S = \frac{v \times t}{2} \text{ or } \frac{a \times t^2}{2} \text{ or } \frac{v^2}{2a} \qquad (3)$$

$$F = ma = \frac{wa}{g} \qquad (4)$$

$$\text{Stored energy} = \frac{mv^2}{2} \qquad (5)$$

Where

M = Mass;

w = Weight in lb.;

a = Rate of acceleration in ft. per sec. per sec.;

g = 32.2 (acceleration in ft. per sec. per sec., due to gravity);

S = Distance or space passed over during acceleration or retardation;

v = Velocity in ft. per sec.;

t = Time in seconds during which v is changing;

F = Force in lb.

In the case under consideration the mass to be accelerated from rest to running speed (v) consists of the coal, cars, rope, drums, track rollers, etc. This is summed up as follows: Up-load, 280,000 lb.; rope, 6,000 lb. wound on drum; rope, 500 lb. holding turns and rope between drum and end of trip; total, 286,500 lb.

If acceleration is to be accomplished in 20 sec.;

$$v = 12.1 \qquad t_a = 20 \qquad a = \frac{12.1}{20} = 0.605$$

$$F = \frac{286,500 \times 0.605}{32.2} = 5,400$$

$$\text{Moment} = 5,400 \times 3.5 = 18,900 \qquad \frac{18,900}{0.80} = 23,600$$

Hoist Proper

The drum is 7x6 ft. and should weigh with gears, etc., approximately 40,000 lb. The radius of gyration will be about 75 per cent. of the drum radius, or 2.62 ft.

Therefore, the WR^2 of the hoist proper will be 40,000 $\times$ 2.62^2 = 275,000.

In order to simplify matters find the effective weight of the drum if it were concentrated at the drum radius; that is, 3.5 ft.

$$WR^2 = 275,000 \quad R = 3.5 \text{ ft.} \quad W = \frac{275,000}{3.5^2} = 22,500.$$

This weight may be considered as traveling at rope speed—that is, 12.1 ft. per sec.—and could have been added directly to the weight of trip and rope.

$$v = 12.1 \qquad a = 0.605 \qquad F = \frac{22,500}{32.2} \times 0.605 = 425$$

The acceleration moment = 425 × 3.5 = 1,480.
Acceleration of material in slope = 23,600.
Total acceleration = 25,080.

During Retardation Energy Is Released

During retardation the energy stored in the moving system has to be given up. In some systems of drive it is partly restored to the line and partly used in lifting the load through the remaining distance of travel. For instance, if a system weighing 100,000 lb. is moving at the rate of 10 ft. per sec., it has stored in it $\frac{100,000 \times 10^2}{32.2}$ = 310,000 ft.-lb., or $\frac{310,000}{550}$ = 564 hp.-sec., which may be dissipated at the rate of 564 hp. for 1 sec., or 56.4 hp. for 10 sec. or at any other rate. It is evident that since during the retardation power is released by the moving parts this power must be given an algebraic sign opposite to the sign used when power is absorbed by the hoist.

Since the retardation is accomplished in one-half the time of acceleration—that is, 10 sec.—the value a will be twice what it was during acceleration. Other values will remain the same. It is therefore possible for the sake of brevity to multiply the acceleration moments by the inverse ratio of the times. Thus

Moment of retardation of up-load

$$\frac{18{,}900 \times 20}{10} = -37{,}800$$

Amount getting back to motor shaft $= -37{,}800 \times 0.80 = -30{,}240$.

Moment of retardation of the drums $=$

$$\frac{1{,}480 \times 20}{10} = -2{,}960$$

$$\text{Total,} \quad -33{,}200$$

Note that in the acceleration and retardation of the drums proper no efficiency has been included. The reason for the omission is that while energy is being stored or given up by the drums there is little or no loss due to this alone. There would be no additional rope stress which in turn produces additional bearing loss. If the hoist is geared, there is added gear loss, but the amount should be small. Since the losses in the hoist proper are taken care of as a percentage of the running horsepower and the horsepower due to the acceleration of the load, it has been decided to omit any correction for loss due to the acceleration or retardation of the drums.

Turns of drum during acceleration and retardation must be calculated so that the moment values may be plotted.

This may be found in a number of ways, but the simplest seems to be the following:

Total turns $= 91$.

Total time $= 180$ sec.

$$t_a = 20 \qquad t_r = 10 \qquad \frac{t_a + t_r}{2} = 15$$

$$\text{Revolutions per second} = \frac{91}{180 - 15} = 0.55$$

Since the running velocity of the drum is 0.55, r.p.s., the number of turns during acceleration $=$

$$\frac{0.55 \times 20}{2} = 5.5$$

The number of turns during retardation $=$

$$\frac{0.55 \times 10}{2} = 2.75$$

TOTAL SUMMATION OF MOMENTS

	Turns					
	0	5.5	5.5	88.25	88.25	91
Up-load	89,000	88,800	88,800	84,700	84,700	84,600
Acceleration and retardation ...	25,080	25,080	0	0	—33,220	—33,220
	114,080	113,880	88,800	84,700	+51,480	+51,380

To convert the moments into horsepower it will be necessary to multiply the moment by the speed in feet per second and divide by 550.

$$\text{Hp.} = \frac{\text{Force} \times \text{Velocity (in ft. per sec.)}}{550}$$

$$= \frac{\text{Force} \times 2\pi R \times \text{r.p.s. (of drum)}}{550}$$

$$= \frac{\text{Force} \times R \times 2\pi \times \text{r.p.s.}}{550}$$

$$= \frac{M \times 2\pi\,\text{r.p.s}}{550}$$

where R = radius of drum in feet.

Turns	Moment	$\text{H.p.} = \frac{(2\pi \text{ M r.p.s.})}{550}$	Time
0	114,080	715	0
5.5	113,880	714	20
5.5	88,800	558	20
88.25	84,700	532	170
88.25	51,480	324	170
91	51,380	323	180

The horsepower value at zero turns is of course zero, since the speed is zero. The value given in the table is known as horsepower torque, or horsepower that would exist if the motor or load were up to speed. By glancing at the horsepower-time curve, it will be seen that the operator starts the trip and accelerates for 20 sec. with a motor output of 714½ hp. At the end of 20 sec. acceleration ceases and the horsepower drops to 558. This speed is held for 150 sec., the horsepower falling to 532, because the rope load and friction have been decreasing during the up-trip. At 170 sec. the retarding is begun, and the stored energy plus 324 hp. output from the motor, will be enough to bring the trip the rest of the way.

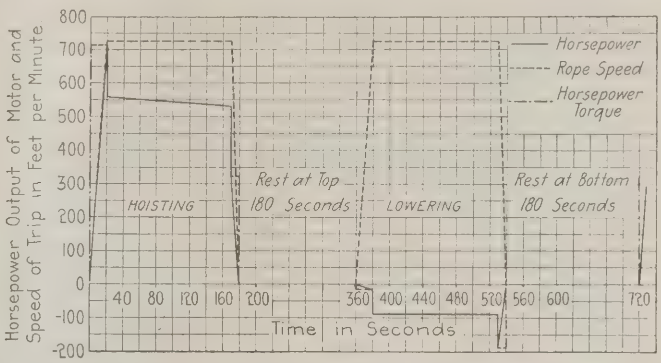


DIAGRAM OF HORSEPOWER, ROPE SPEED AND HORSEPOWER TORQUE

Lowering the Empty Trip

In the majority of slopes of this nature the lowering is accomplished by unclutching the drum and letting the motor stand idle. The energy given up by the descending trip is converted into rolling friction and friction on the brake of the hoist.

It is possible and entirely practical in case of induction motor-driven hoists to restore part at least of this energy to the line. This is accomplished by starting the motor with its trip in the lowering direction and as full speed is reached throwing the control handle into the full on position. The load will then overhaul the motor, tending to drive it above synchronism. The motor will then become a generator and return such energy to the line as is not absorbed by friction of moving parts. In bringing the trip to rest the controller is thrown to the off position and the brakes applied as usual.

It will be instructive to find how much energy the example given would return to the motor while lowering. It must be remembered that all friction values are positive, since they require power, and the energy given up by the trip will be negative.

Moment of trip:

Weight $= 3{,}000 \times 40 = 120{,}000$ lb.

Effective weight = 120,000 × 0.06 = 7,200 lb.

Moment at 0 turns = —7,200 × 3.5 = —25,200

Moment at 91 turns = —7,200 × 3.5 = —25,200.

Moment of rope:

Moment at 0 turns = 0.

Moment at 91 turns = —6,000 × 0.06 × 3.5 = —1,260.

Moment of rolling friction:

120,000 lb. = 60 tons.

60 × 35 = 2,100 lb.

Moment at 0 turns = 2,100 × 3.5 = 7,350

Moment at 91 turns = 2,100 × 3.5 = 7,350.

Rope Friction

The total weight of the rope = 6,000 lb. = 3 tons at 200 lb. friction per ton = 600 lb.

Moment at zero turns = 0.

Moment at 91 turns = 600 × 3.5 = 2,100.

SUMMATION OF MOMENTS LESS MECHANICAL FRICTION OF HOIST

	Turns	
	6	91
Down trip	—25,200	—25,200
Down rope	0	—1,260
Rolling friction	+ 7,350	+ 7,350
Rope friction	0	+ 2,100
	—17,850	—17,010

Assumed mechanical efficiency of hoist = 80 per cent.

At zero turns —17,850 × 0.8 = —11,000, or the frictional loss = 3,850.

At 91 turns —17,010 × 0.8 = —13,608 or frictional loss = 3,402.

Total net moments exclusive of acceleration and retardation:

	Turns	
	0	91
	—17,850	—17,010
Mechanical friction	+ 3,850	+ 3,402
Total	—14,000	—13,608

Acceleration and Retardation

The total moving parts have to be accelerated exactly the same as in the case of hoisting. Since it will require power to do this, the sign will be positive as before.

Weight of trip 120,000 lb.
Weight of rope 6,500 lb.
Total weight in slope 126,500 lb.

Acceleration in 20 sec. as before,

$$v = 12.1 \quad a' = 0.605 \quad F = \frac{126{,}500 \times 0.605}{32.2} = 2{,}375$$

Moment = 2,375 × 3.5 = 10,380

Weight of drum = 22,500 lb.

$$F' = \frac{22{,}500 \times 0.605}{32.2} = 422$$

Moment = 422 × 3.5 = 1,480

Total acceleration moment, 11,860

Retardation in 10 sec., as before,

Cars and rope weigh 126,500 lb.

$$a = \frac{12.1}{10} = 1.21 \quad F = \frac{-126{,}500 \times 1.21}{32.2} = -4{,}750$$

Moment = —4,750 × 3.5 × 0.8 = —13,296

$$\text{Drums as before } \frac{-1{,}480 \times 20}{10} = -2{,}960$$

Total retarding moment, —16,256

Turns during acceleration and retardation same as during hoisting; that is, 5.5 for acceleration and 2.75 for retardation.

TOTAL SUMMATION OF MOMENTS

	Turns					
	0	5.5	5.5	88.25	88.25	91
Net load	—14,000	—13,900	—13,900	—13,650	—13,650	—13,608
Acceleration and retardation.	11,860	11,860	0	0	—16,256	—16,256
	—2,140	—2,040	—13,900	—13,650	—29,906	—29,864

$$\text{Horsepower as before} = \frac{2\pi M \times \text{r.p.s.}}{550}$$

Turns	Moment	Horsepower	Time
0	—2,140	—13.5	360
5.5	—2,040	—12.7	380
5.5	—13,650	—85.6	380
88.25	—13,900	—87.3	530
88.25	—29,906	—188	530
91	—29,864	—187.5	540

This concludes the calculations for the determination of the duty cycles for an unbalanced slope haulage for both hoisting the loads and lowering the empties. The duty cycles as plotted show the power to be delivered by the motor at its coupling to the hoist when it is raising the load and the power that would be put into the motor at its coupling by the downgoing empties. The speed as shown on the duty cycles is the same for both lowering and raising.

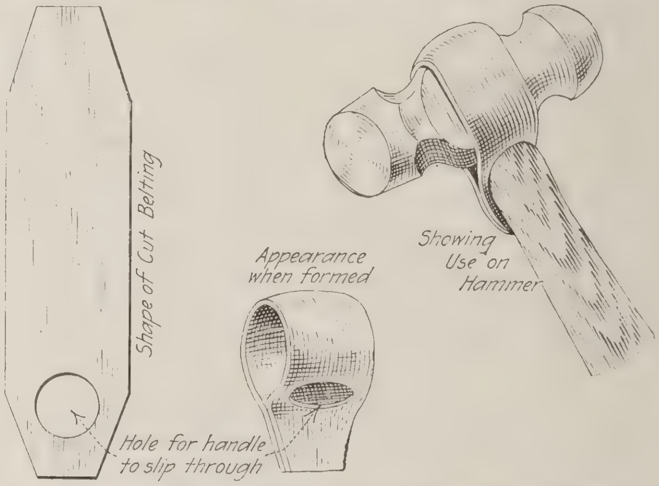
If the lowering were accomplished with the motor pumping back into the line, as is entirely practical in this case, the speed of lowering would be a few points in percentage above the speed of hoisting, as the motor would have to run above synchronous speed before it could become a generator.

The determinations of the proper rating for a motor to meet this cycle will be taken up later in this series of articles.

⁂

A Handy Soft Hammer

An ordinary engineer's hammer can be made to serve in place of a mallet for use on wood or other soft materials by using a piece of leather or belting in the manner shown in the drawing. A hole is cut in the leather large enough to be slipped over the end of the handle and the leather is then slipped to the head of the hammer. The leather is then flapped over the head of the hammer and nailed onto the handle, or the two ends are wrapped to the handle with several turns of fine wire. The hammer is used sidewise on wood, which brings the leather belting into play and softens the blow. In this way the user has a hammer ready for various uses in a compact and convenient form. The leather will wear for a long time.—*American Machinist.*



ENGINEER'S HAMMER WITH LEATHER CUSHIONING

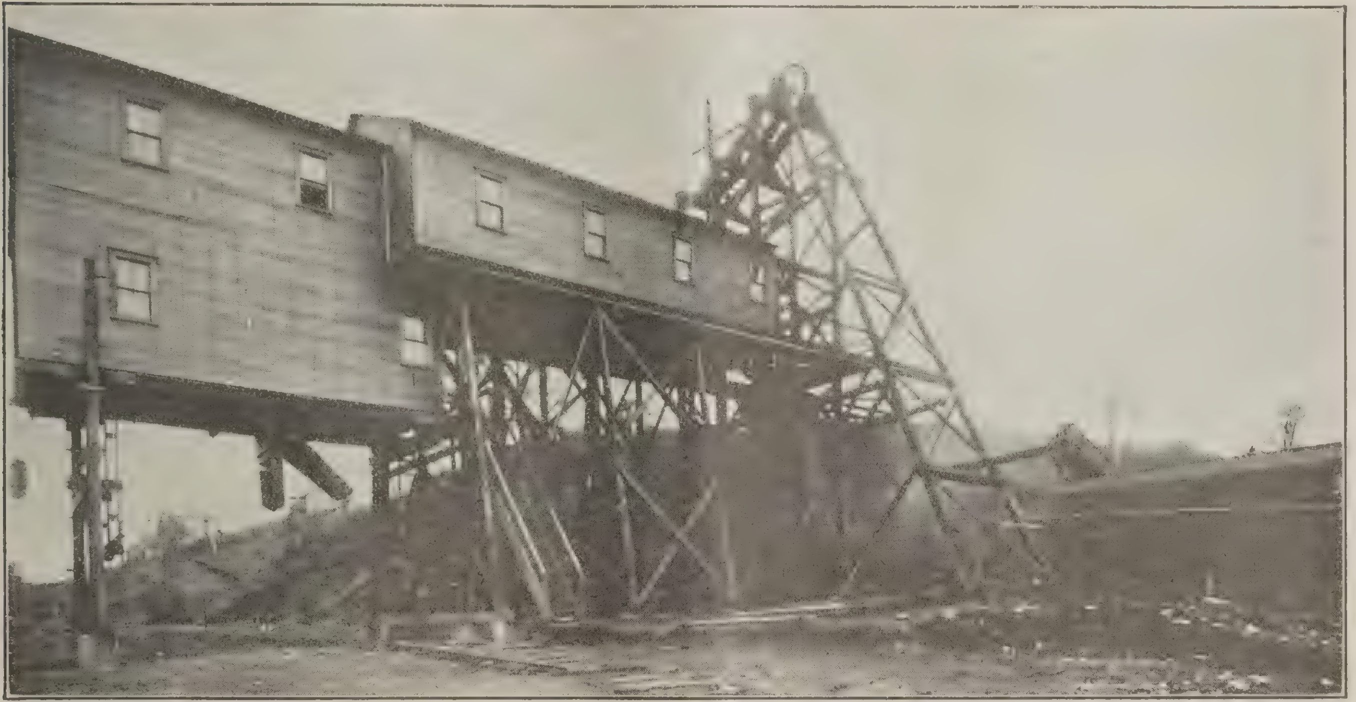
Canonsburg Gas Coal Co.'s Plant

By C. M. Means*

SYNOPSIS—An interesting installation where both alternating and direct current are purchased. This obviates the use of a substation. Electric power is used to drive the fan, pumps, mining machines and haulage. An electric hoist is also employed to lift the coal 150 ft.

It is a well-recognized fact that the design of a mining plant should take into account the size, maximum economical output and life of the mine. The following description covers equipment at a mine of limited area where for commercial reasons it is desirable to limit the daily output to a certain amount.

The Canonsburg Gas Coal Co. has opened a mine in Washington County, Pennsylvania, tapping the Pittsburgh measures with a 154-ft. shaft and an equipment designed for a capacity of 1,000 tons per 8-hr. day. It happens that this mine is in a locality where power can be secured from either of two power companies that serve coal mines extensively. One company was in a position to furnish both alternating and direct current, and the contract was closed with this concern, as the rates of the two companies for alternating power did not differ materially. Direct current is purchased at the rates prevailing for alternating current plus the actual cost of conversion.



TIPPLE AND HEADFRAME OF CANONSBURG GAS COAL CO.'S MINE

Since the company is able to purchase both kinds of current, the use of a substation at the mine is unnecessary. Alternating current at 440 volts is being furnished for the operation of the hoist, ventilating fan and pumps at the bottom of the shaft. Direct current at 500 volts is taken from the busbars of the trolley company's substation and used to operate mining machines, locomotive haulage and all the pumps that are located in the advance workings.

Alternating current is transmitted at high voltage to an outdoor transformer station, at which point the current is stepped down to 440 volts for use at the mine. Direct current is transmitted about 2,000 ft. from the power company's substation to the mine opening, but at a little later date when the underground workings are developed, it will be possible to carry the direct current over a circuit taken down a borehole close to the substation and tap the underground distribution at a central point, thereby securing good voltage regulation throughout the entire mine with a minimum amount of copper for feeder lines.

Ventilation is effected with a disk fan belt-driven by a variable-speed induction motor. A small fan and motor are used for the present, but as soon as the ventilation conditions and requirements are thoroughly ascertained a fan designed to meet the actual conditions at the highest efficiency will be installed, together with a motor of proper size and operating characteristics. Owing to the uncertainty of ventilation requirements at a new mine and the low efficiency of a large fan and motor, it is not advisable to attempt to install a permanent fan until the operating conditions have been fully ascertained.

Description of Hoisting Outfit

The hoist is placed at the end of the shaft and consists of a 60-in. single-drum Lidgerwood hoist using a 1⅛-in. rope. It is provided with post brakes and single reduction herringbone cut-steel gears properly protected. The motor consists of a 100-hp. three-phase 60-cycle 440-volt slip-ring motor, connected to the hoist through a flexible coupling specially designed for heavy reversing duty. The control is of the contactor type, and acceleration is performed automatically.

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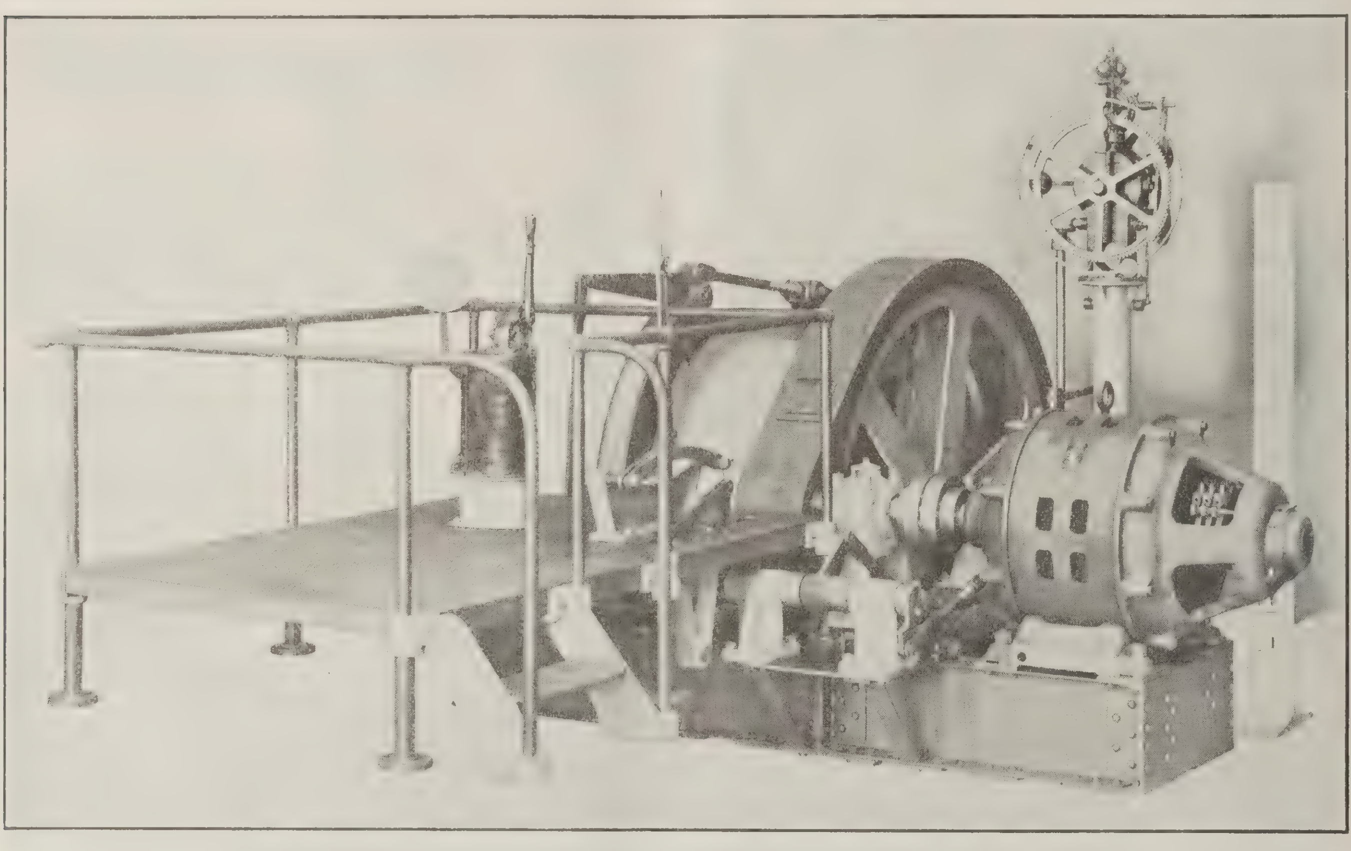
*Pittsburgh, Penn.

A suitable safety device is included, which prevents overspeeding and overwinding. It also compels slowing down at the extremes of travel and brings the hoist to rest by setting the brake and cutting off the power should the operator fail to do so. The theoretical power required to hoist a ton of coal at this mine was calculated to be 0.361 kw.-hr. In actual practice it was found that the current consumption was 0.412 kw.-hr. per ton. The duty cycle curve attached herewith shows the operating conditions and the maximum demand created in hoisting.



LIDGERWOOD ELECTRIC AUTOMATIC HOIST AT THE CANONSBURG PLANT

The pumping at the bottom of the shaft is accomplished with plunger-type pumps driven with 440-volt alternating-current motors. Sufficient pumping capacity and sumpage are provided so that all pumping can be done when the other power requirements at the mine are smallest, during what is termed the off-peak period. This results in the corporation securing a low rate for the power used in pumping.

The haulage equipment at present consists of one six-ton gathering locomotive, but additional locomotives of proper size will be added as the workings become extended and the capacity increases up to normal.

The coal is undercut with breast-chain machines, used because of the large amount of narrow work. When it is found that shortwall or other types of mining machines can show an economical advantage, they will be installed, but for the present only those of the breast type will be used.

I am indebted to H. A. Davis, president of the company, for the courtesy extended in securing the information from which this description was prepared.

Winter Meeting of W. Va. Coal Mining Institute

The semiannual meeting of the West Virginia Coal Mining Institute will be held at Fairmont, W. Va., Dec. 8-9, 1915. The Wednesday morning session will open at 10 o'clock, when the following papers will be read: "Relation of Mine Officials to the Consumer," by R. Z. Virgin, Colliers, W. Va., and "Why Buy a Storage Battery Locomotive," by J. R. Cameron, Cincinnati, Ohio. At 2 o'clock in the afternoon R. J. Beaman, Cincinnati, Ohio, will read a paper on "Uniform Accounting and Cost Records as Applied to Coal Mining," and G. E. Greer, Morgantown, W. Va., will follow with a paper entitled "Projecting a Mine on the Panel System," after which a business session will be held.

On Thursday at 9:30 a.m., the following papers will be read: "Some Suggestions and Ideas Based on Observation," by J. W. Bischoff, Elkins, W. Va.; "The Demonstration of a Portable Gas Detector," by G. A. Burrell, Pittsburgh, Penn.; "Day Labor in Bituminous Mines," by G. S. Brackett, Flemington, W. Va. In the afternoon at 2 o'clock papers will be read on "Welfare Engineering as Applied to Coal Mines," by W. F. Hyde, Wheeling, W. Va., and "Needed Reforms in the Coal Mining Industry," by K. F. Schoew, Huntington, W. Va. The afternoon session will end with a symposium relating to the question, "What is the Matter with the Coal Business?" In the evening at 8 o'clock President J. C. McKinley, of Wheeling, W. Va., and Judge W. S. Haymond, of Fairmont, W. Va., will address the institute on matters of interest and importance.

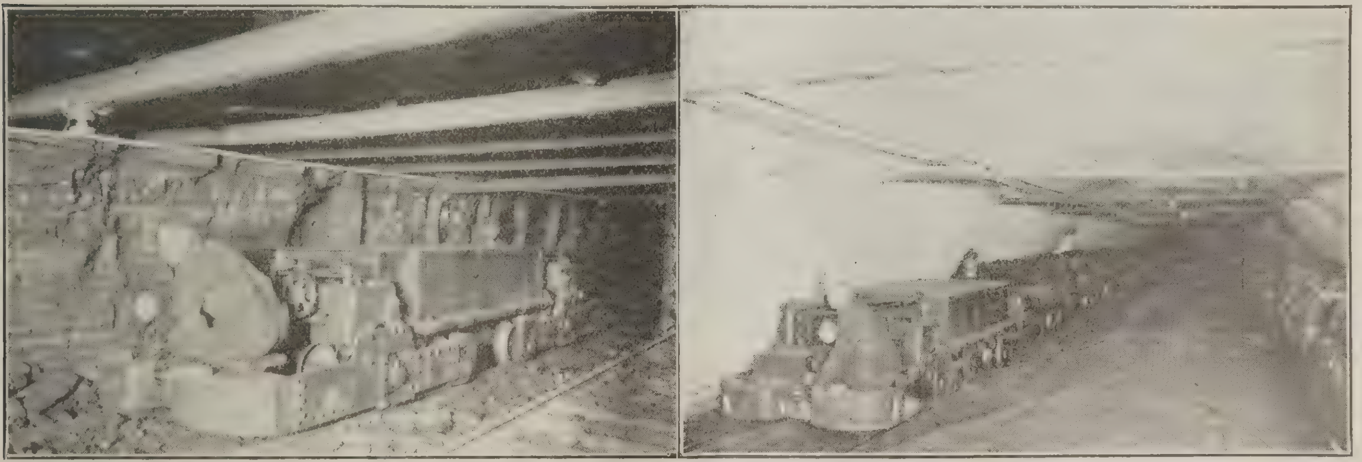
The day sessions will be held in the assembly room of the Watson Building; the meeting place for the evening sessions has not yet been announced.

Novel Combination Locomotive

By E. C. De Wolfe*

SYNOPSIS—Mounting the storage battery of a combination locomotive on a low platform carried between two swiveling trucks each provided with a motor, one pair of drivers and one pair of bogies not only greatly facilitates rounding sharp curves in the track, but provides against electrical overload through wheel slippage. Split-winding of the motors gives two speeds at rated drawbar pull on either battery or trolley.

Not in days of time nor miles of travel can one find a more enthusiastic enthusiast on the storage-battery locomotive proposition than H. M. Stewart, superintendent of the Grant Coal and Mining Co.'s operation at New Goshen, Ind., 11 mi. north and west of Terre Haute. He admits that he has a large ampere-hour capacity of experience, information and opinion on which he can draw heavily for extended periods without slipping a wheel or materially reducing his voltage. And what he says has behind it the weight of authority, for he has done considerable rapid and economical development during the past three years, using storage-battery locomotives for gathering and trolley locomotives for main-haulage work.



FIGS. 1 AND 2. SHOWING ARTICULATED LOCOMOTIVE IN AN ENTRY AND AT THE SHAFT BOTTOM

And while in general the field of usefulness for the storage-battery locomotive is as yet by no means clearly defined, there is no question of its utility in the mind and mine of Superintendent Stewart. Furthermore, although general experience up to the present time does not indicate that the storage-battery locomotive can generally supersede the trolley type for haulage, or the trolley-and-reel type for gathering, nevertheless nothing but storage-battery machines could be furnished to Mr. Stewart for his own use in gathering.

Engineers of the broadest experience seem to agree that the field of particular utility for the storage-battery type of locomotive is now, and will probably continue to be, restricted to special conditions wherein the distinct advantages of wholly independent operation are sufficient, and sufficiently easy of realization, to offset the inherent disadvantages and high cost of the storage battery and the locomotive which it drives. The type will undoubtedly be developed in design and its adaptability to mine conditions thereby improved, so that the range of service suitability may be correspondingly widened.

Mr. Stewart's Novel Form of Combination Locomotive

As a matter of fact, Mr. Stewart—a devotee of the storage-battery locomotive, experienced in its use, familiar with its limitations, keen for its improvement and quick to recognize practical and practicable advancement in its efficiency—has now in service a new storage-battery locomotive of wholly novel form, with numerous features of construction and operation which tend to obviate the disadvantages of older designs and mark long forward steps toward making the type more broadly useful.

This locomotive was built and furnished by the Goodman Manufacturing Co. and is designated as an articulated type—a name naturally suggested by the construction and further justified by the number of particularly advantageous features for which the articulated design is directly responsible.

A storage-battery locomotive is unavoidably heavier than necessary for realization of the tractive effort which can be developed for long operating periods by the battery and the battery-driven motors. Consequently the placing of a battery on a locomotive of substantially standard type, with four wheels, all driven, causes an excess of weight on the drivers and robs the electrical parts of the protection against overload, which is so properly provided by slippage of the wheels in any locomotive of correct design.

Superimposing the battery upon the deck of a locomotive of standard form causes increase of height, which is a feature disadvantageous in many mines for which storage-battery operation is particularly desirable. Such a position of the battery covers the working parts of the machine, thereby interfering with the accessibility. It also raises the center of gravity unduly high.

These fundamental difficulties in use of the standard locomotive form for storage-battery operation are ob-

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*608 South Dearborn St., Chicago, Ill.

viated in the articulated construction, which also permits incorporation of several additional features which would be wholly impractical in the other arrangement. That is to say, the articulated locomotive is designed throughout with direct reference to the needs and limitations of storage-battery operation.

THE MECHANICAL FEATURES

The battery in the articulated machine is placed low, on a platform carried by the reachbar between two bogy trucks, each of which has a motor geared to one axle. The other axle is idle and is fitted with relatively small wheels, which have clearance for swing underneath the battery platform. Thus the locomotive has eight wheels. over which the total weight may be so distributed as to bring more or less than half on the drivers, as may be desirable.

In Mr. Stewart's locomotive the drivers carry somewhat more than half the weight, and as the total is 6 tons there is at the drivers a track pressure of about 4 tons effective for tractive purposes. At 25-per cent. adhesion, this gives a drawbar pull of 2,000 lb. It is easy to provide electric and mechanical equipment to suit this drawbar pull and thereby afford the wheel-slippage protection so desirable in any electric locomotive.

The construction provides space for an adequate battery—375 amp.-hr. in the present instance—without making the locomotive unduly high or interfering with the accessibility of any of the working parts. The available space for the battery is not subject to hampering limitations, since length can be taken as desired, the only effect of increased length of battery box being to spread the distance between the king bolts of the two trucks, and as these are bogies such spreading does not affect the ease of operation on curves.

Its weight carried on eight wheels, the locomotive will run on lighter track than a machine of similar weight on four wheels. Because of the short wheelbase for each bogy truck, the locomotive will turn short radius curves as easily as a mine car. In fact, the machine as a whole is to be regarded in its track performance as being similar to two coupled mine cars of 3 tons' gross weight each, except that by its better construction and squat proportions it has much greater stability and far less liability to derailment.

In rounding curves, the truck ahead acts like a pilot truck of a railroad locomotive, taking the curves easily and safely. The leading wheels being well in advance of the king pin, the forward end of the battery is started around the turn without shock to track or locomotive, and the whole machine follows with none of the impact effects which in four-wheel locomotives mean heavy flange pressures, jerky turns and track troubles.

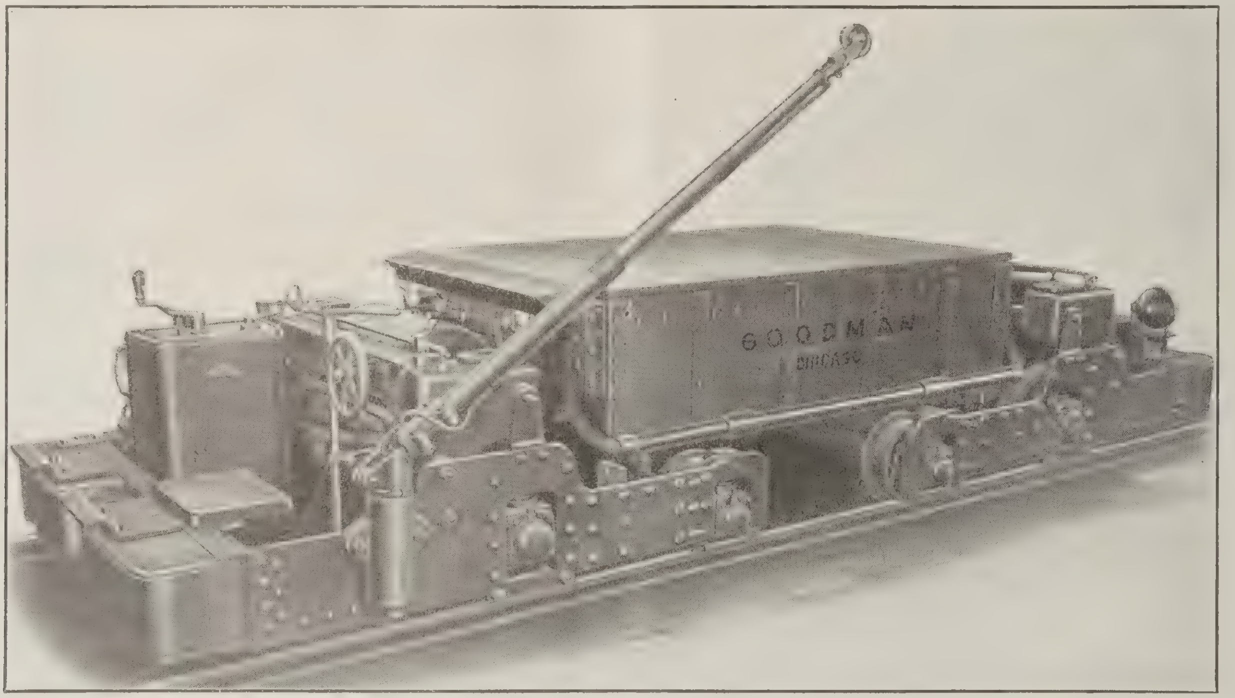

FIG. 3. LOCOMOTIVE WITH TROLLEY ON DRIVER'S END

The articulated construction therefore produces a locomotive which to all operative purposes is as short as a mine car or even shorter. The distance from drawbar pin to driving axle being small, even while providing unusually generous cab spaces for both motorman and trip rider, the drawbar pin is not thrown so far out from the center line of the track in rounding sharp curves nor the corner of the cab so far beyond the outer rail as with a four-wheel locomotive of standard construction. Easy rounding of curves is further facilitated by the ball bearings at the king pins.

The motors and all parts are readily accessible, as they are in no way covered or concealed by the battery. The locomotive is an antifriction machine in all its bearings, and all gears run in oil. Sandboxes are placed high and so give good head for proper flow.

THE ELECTRICAL FEATURES ARE NOVEL

Electrically, the locomotive is equally novel and thorough in design and construction. It is made especially effective and efficient by having split-wound motors and provision for operating by trolley when on the main-haul entries.

The split winding of the motor fields gives two speeds of operation without running on the rheostat, thus conserving the battery charge by avoiding waste of power in the resistance on slow runs. Mr. Stewart's locomotive, at its rated drawbar pull of 1,500 lb., will travel 3½ mi. per hr. on the battery and 6 mi. per hr. on the trolley. The split-wound control gives also a slow speed for each method of operation—2¾ mi. per hr. on the battery and 4¾ mi. per hr. on the trolley, at full rated drawbar pull and without running on the rheostat.

The advantages of this arrangement are obvious. The locomotive can work at either battery speed while gathering from rooms and entry headings, and then at either of the two higher speeds in hauling gathered trips on the trolley-wired entry to the main haul parting or even all the way to the bottom.

These several running speeds give great flexibility and high economy of operation. The use of the trolley on the longer runs not only conserves the battery charge, but also increases the production by speeding up the delivery of trips to the partings and the return with empties. An ample and adequate controller of full locomotive type is provided, to assure proper reliability in this important feature.

The Locomotive in Operation

Loads are hauled from the face in rooms and entries, but empties are dropped off at the room necks and pushed in by the loaders.

The motorman works alone on the locomotive in entering the rooms for loads. The trip rider remains on the entry to couple up the trip, and then he rides in the front cab as the trip is hauled out the butt entry onto the side entry and thence to the main haulage parting. The trolley pole is placed at his end, where he can readily put it up whenever the trolley wiring is available. It could of course be placed at the motorman's end if desired, as may be seen in Fig. 3.

The articulated trucks are exceptionally free in rounding a curve, and the overall height of the locomotive is small as compared to the loaded cars. Higher types of storage-battery locomotives heretofore used in this mine have necessitated extensive brushing of roof—a costly operation which will be greatly reduced where the Goodman locomotive is operated. This lower machine has been useful in territory to which the older ones could not go.

The roof in many places is irregular in contour and quality, and while not so poor as to make trolley wire maintenance on the entries particularly difficult, Superintendent Stewart certainly avoids possible trouble by not stringing any.

He also has been able to get along with half the generating plant otherwise necessary, as only the main-haulage locomotives have to be served during working shifts, the storage batteries being charged at night.

Other Reasons for Storage-Battery Motors

Other operators may find various other reasons for the use of storage-battery locomotives. Among them might be mentioned such conditions as the following:

1. Where additional locomotive service is required and the power plant is already loaded. The storage battery, charged at night, may relieve this situation and avoid the necessity for enlarging the power plant.

2. Where large immediate increase of haulage equipment is required, to meet a sudden demand for coal when time and possibly the temporary character of the demand may not permit or justify enlargement of the power plant.

3. Where the territory served is widely scattered in proportion to the output, making unreasonably expensive the trolley wiring and rail bonding for a regular trolley locomotive.

4. Where, because of gaseous conditions, the mining laws prohibit the use of trolley locomotives on the return air. Under such circumstances a mine already laid out with rooms turned off both entries must have a storage-battery locomotive, or use mules, to serve the back entries on the return airway.

5. Where alternating-current cutting machines are used. Storage batteries may be charged through a rectifier at less expense than for a motor-generator set to drive a trolley locomotive, besides saving the expense of wiring and bonding, which would not be required for nor utilized by the cutting machines.

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Electrically Operated Colliery

By B. H. Stockett*

Starting Apr. 9, 1913, a new colliery 1 mi. west of Shenandoah, Penn., began its unique life—unique in comparison with the surrounding collieries owing to its being operated by electricity. This was the Weston colliery of the Locust Mountain Coal Co.

The only parts of the plant not operated by electricity are the heating system and six steam shovels on the stripping which are used for removing overburden and loading coal. There is a motor equipment of 1,363 hp. electric, divided as follows:

Breaker—three 100-hp. motors for a main drive, one 20-hp. motor for a conveyor line, one 20-hp. motor for a tail-rope haulage on refuse.

Machine shop—one 20-hp. motor for all machines.

Car hoists—two 35-hp. motors.

Compressors—two 100-hp. motors on a short-belt drive.

Plane hoist—one 50-hp. motor on a letting-down plane.

Fans—two 7.5-15-hp. motors running disk-type fans

Locomotives—three 80-hp. motors and one 60-hp motor for haulage.

Pumps—two 10-hp. motors for fresh water to steam shovels, one 50-hp. motor and one 35-hp. motor for wash water.

Miscellaneous—four 5-hp. motors for small hoists used in place of mules, one 3-hp. motor blow for fan in boiler house.

Electric shovel—one 225-hp. motor operating a dragline excavator for stripping purposes.

The company does not own a mule or horse, and everything except actual teaming is done with small hoists and electric locomotives. While in some cases this may seem difficult, it is working out with great success, and all in any way connected with the operation are more than enthusiastic over electricity, both for its ease in operation and its economy.

The power is furnished by the Schuylkill Gas and Electric Co. and is delivered at 4,000 volts alternating current, three phase, 60 cycle. It is then stepped down to 440 volts, which is the regular working voltage. The mine locomotives and some of the inside hoists use 250 volts direct current.

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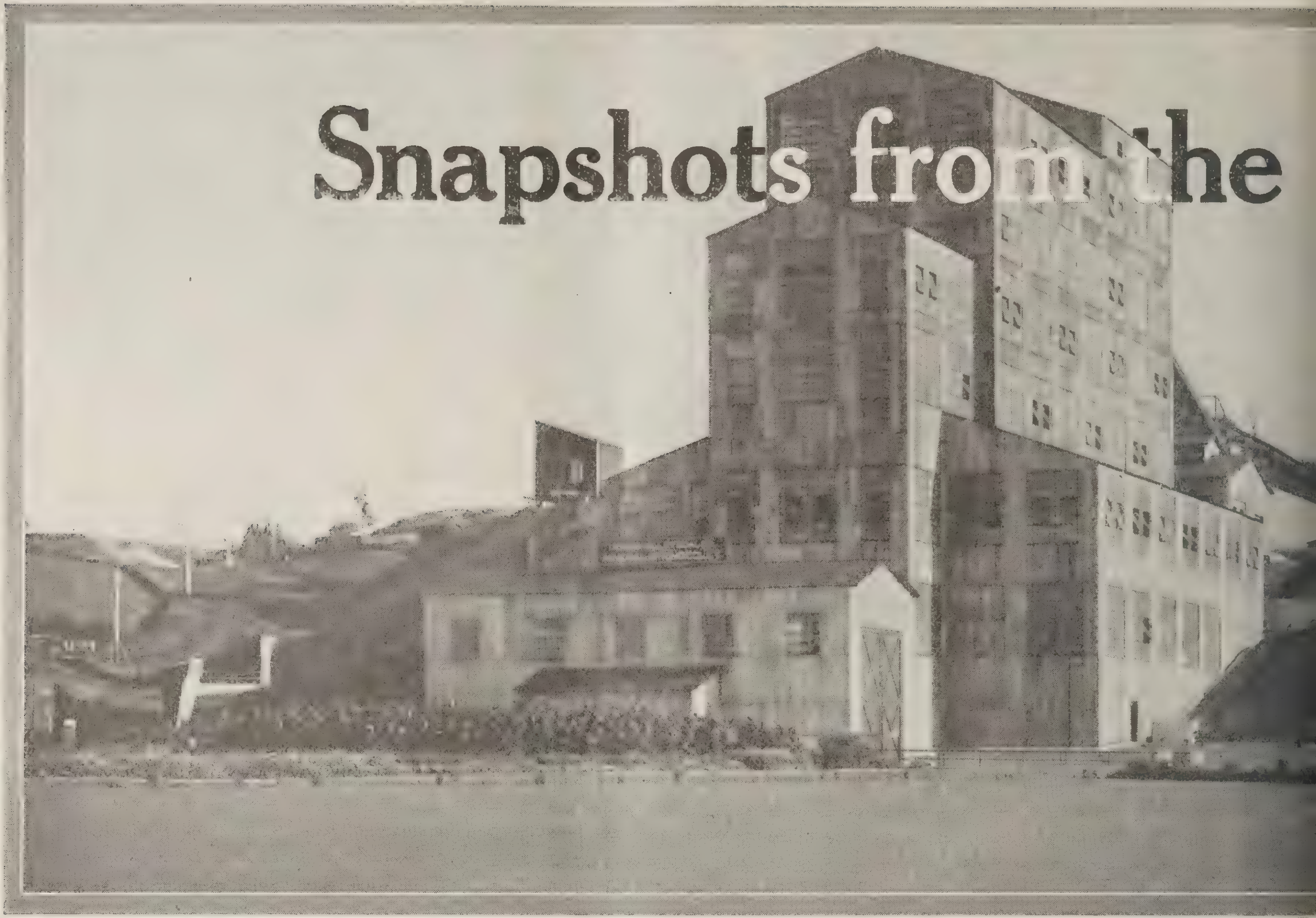
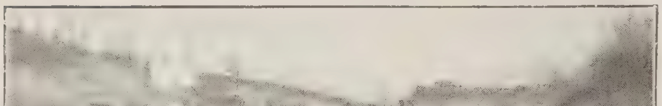
*Shenandoah, Penn.

Snapshots from the

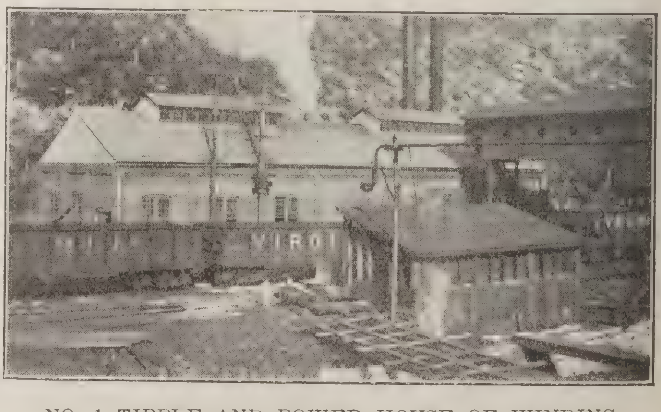


THE NEW MINERAL SPRING BREAKER OF THE LEHIGH VALLEY COAL CO. AT



LEHIGH COAL AND NAVIGATION CO.'S MAMMOTH STRIPPING AT NESQUEHONING, PENN.

NO. 2 TIPPLE OF WINDING GULF COLLIERY CO. IN W. VA.



NO. 1 TIPPLE AND POWER HOUSE OF WINDING GULF COLLIERY CO.

Coal-Mining Field

PARSONS, PENN. NOTE THE HIGHLY IMPROVED AND BEAUTIFIED SURROUNDINGS

— SOME STAG CAÑON FUEL CO. HOUSES AND COKE OVENS AT DAWSON, N. M.

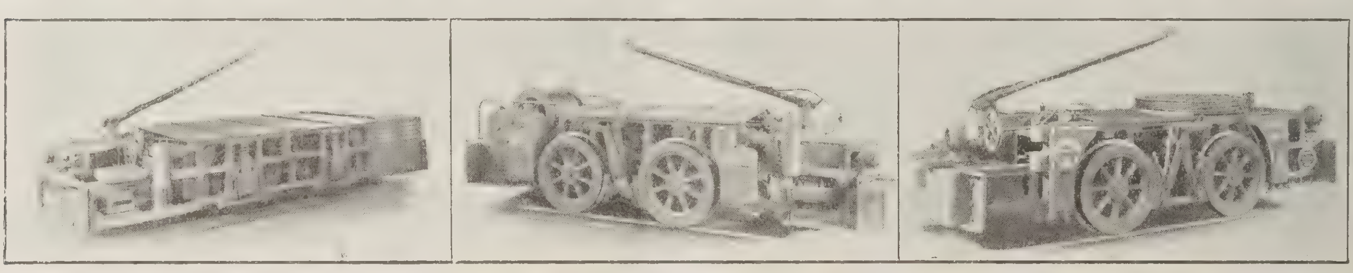
Combination Gathering Motor

By F. J. Foley*

SYNOPSIS—A locomotive low in height and sufficiently powerful to slip its drivers when operating from the battery has been installed to take the place of the reel type of motor. This machine has now been in successful operation for several months.

Few operations in the production of coal for market offer greater opportunities for trouble or expense than the gathering of loaded cars from the rooms and their delivery to the haulage road. Many systems of transportation have been tried with varying success, but none has entirely satisfied the producer that it combined the necessary qualities of reliability, economy and safety.

In the earlier stages of mining in various parts of the world, humans—sometimes men, often women—dragged or carried the coal out in baskets. Later various animals such as horses, mules, oxen and even dogs were tried. In the larger operations, however, the cost of transportation by these means was found to be excessive. While the mule has done and is still doing good work in this field, these animals are expensive, their lives underground are short, they are easily injured and must be fed regularly. Furthermore damage suits from accidents caused by vicious mules have been a source of considerable expense.



FIGS. 1, 2 AND 3. SHOWING COMBINATION AND THE HORIZONTAL AND VERTICAL REEL TYPES OF LOCOMOTIVES

Locomotive Is More Economical

The reel type of gathering locomotive has supplanted the animal in popular favor and has been found to be much less expensive, more reliable and safer, but in many instances this machine has serious drawbacks. There are few operators using this type of gathering locomotive who are not looking for something cheaper, more reliable and less dangerous. The gathering reel has solved many of the old problems, but is still possessed of many features that admit of improvement.

The use of a reel locomotive means overhead-trolley construction up to within about 500 ft. of the working face. Furthermore the track must be bonded unless double conductor cable is used. Such a cable is an item of considerable expense.

Conductor cable is easily damaged, and the cost per locomotive is from $40 to $60 for a 500-ft. cable. The life of such a conductor is not long—in severe service it may not be over one month. There is also the disadvantage that no one knows when this conductor will be damaged and the locomotive possibly be put out of commission for several hours. Cable with badly damaged insulation has caused many serious injuries to the locomotive operators and others.

When the storage-battery locomotive was first successfully operated in the metal-mining field many coal men felt that here was a solution of their difficulties. This proved at least partially true for new operations which were developed especially for this class of gathering, but in mines taking cars from several rooms and hauling them 1,000 to 1,500 ft. to the main haulage road against severe grades the battery locomotive was not economical. Furthermore it was found difficult to keep the height of a storage-battery locomotive down to the proper amount for a mine with a 3-ft. coal bed.

The Combination Locomotive Developed

The best solution appeared to be to combine the good features of both types of locomotives; that is, to construct a machine using the battery for proceeding into the rooms for the individual cars and the trolley for hauling the small trips to the parting. This type of machine has been developed and is now operating quite successfully.

In order to convey a good idea of this type of locomotive, a description will here be given of a machine that has been operating for several months at the Keokee mine of the Stonega Coke and Coal Co., of Big Stone Gap, Va.

Recently this company changed management, and simultaneously changed its operation to central-station power, taking current from the Kentucky Utilities Co. Old methods and equipment are now being discarded and replaced with the most uptodate and efficient methods obtainable.

Local conditions in these mines made the reel locomotive expensive, since the rooms were driven 300 ft. long 50 to 75 ft. on centers. Cross-entries are 2,500 to 3,700 ft. long. The cars weigh 7,700 lb. loaded and 2,000 lb. empty. The trolley locomotive formerly used hauled trips of five cars up a steep grade 300 ft. long. It was also capable of starting a train of four loaded cars on the same grade.

Troubles from failure of the cable, etc., had been frequent at this mine, and the combination locomotive was decided on as the remedy. The following specifications cover the machines now in use: Weight in working order, 6 tons; gage, 3 ft. 8 in.; wheelbase, 3 ft. 9 in.; height to top of frame, 29½ in.; height over all exclusive of trolley, 30 in.; length over all exclusive of bumper blocks, 13 ft. 6 in.; steel-tired wheels, 24-in.

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*Pittsburgh, Penn.

diameter, 3½-in. tread, with 1x1-in. flanges; width of locomotive over all, 67¼ in., the frames are outside of the wheels.

Mechanically the locomotive is exactly the same as a standard trolley type with "Barsteel" frames, M. C. B. brake shoes and an automatically locking screw type of brake mechanism.

STANDARD MOTOR EQUIPMENT IS USED

The motor equipment is also identical with that used on standard locomotives, being two 28-hp. commutating-pole motors equipped with ball bearings. These motors known as No. 904-C are connected to the axles by single-reduction gearing, consisting of one split cast-steel gear and a special-process steel pinion keyed to the motor shaft. These gears are inclosed in a split case of malleable iron which is both grease-tight and dust-proof. The battery has 48 type 9-MV Ironclad Exide cells as manufactured by the Electric Storage Battery Co., of Philadelphia, Penn. These cells have a normal capacity of 128½ amp.-hr., or 12.1 kw.-hr. The normal rate of discharge is 25.9 amp. for 5 hr.

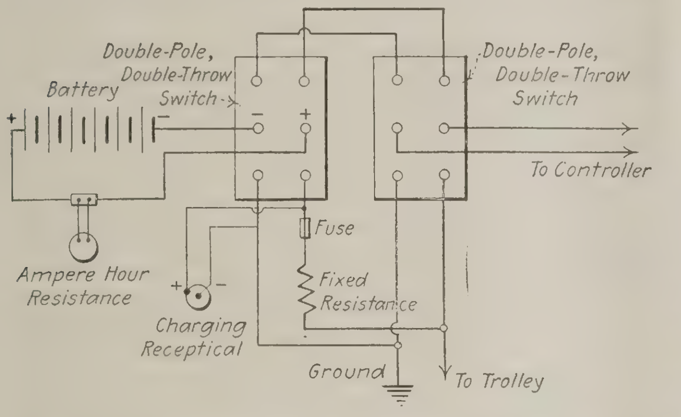

FIG. 4. CONNECTIONS BETWEEN TROLLEY AND STORAGE BATTERY

The battery is arranged in trays so that it may be readily removed. The trays are assembled in steel battery compartments located below the top and between the side frames of the locomotive. The compartments are supported by rolled steel foot plates and cross-members, a weatherproof cover being provided over the battery compartments. The major portion of the battery is at the rear end of the locomotive, the remainder being in front.

The locomotive is designed so that it may be operated from the trolley alone, from the battery alone or from the trolley with the battery being charged. To accomplish these changes two double-pole double-throw switches have been provided to change the connections from the trolley to the battery and vice versa. In addition provision is made so that the battery may be charged at night when the locomotive is not in service. As may be readily seen from the accompanying diagram of connections, these changes may be made almost instantly, so that no delay is occasioned in changing from battery to trolley or the reverse.

TWO SPEEDS ARE ATTAINABLE

Operating from the trolley, the locomotive has a speed of 6 mi. per hr. with a clean, dry rail and a rated voltage of 250 at the trolley. The speed when operating from the battery is 1.3 mi. per hr. based on the average discharge voltage of the accumulator. The starting drawbar pull using sand is 3,600 to 4,000 lb., depending of course on track conditions. The battery is capable of slipping the wheels.

With 30-per cent. adhesion, corresponding to a tractive effort of 3,600 lb., the battery will operate the locomotive at 1 mi. per hr. upon its average discharge voltage, or at 0.6 mi. per hr. with its final voltage.

When working at the one-hour rating of the motor, the locomotive will exert a drawbar pull of 3,350 lb. at either 5.6 mi. per hr. from the 250-volt trolley, or at 1 mi. per hr. from the average voltage of the battery. When exerting a drawbar pull of 1,000 lb., the machine will develop a speed of 8½ mi. per hr. from the 250-volt trolley, or 2¾ mi. per hr. when operating from the battery at average discharge voltage.

THE ADVANTAGES AND DISADVANTAGES

A comparison of the advantages and disadvantages of the combination trolley and storage-battery locomotive is interesting. The advantages are approximately as follows: No track bonding in rooms or butt entries; no overhead trolley construction in rooms; or cable reels; no cable maintenance; no possibility of injury to employees from defective insulation; the ability to pull cars to and from the rooms when the trolley voltage fails; also the ability to run out of the mine even when the current is off from the trolley.

The disadvantages may be summarized as follows: The necessity of provision for charging the battery; a renewal of the battery every two or three years; a slightly higher first cost for the combination machine; the cost of charging the battery.

It would appear from the foregoing that the disadvantages are far outweighed by the advantages, particularly when it is considered that the extra cost of charging the battery over the extent of using the power directly in the motor is but a small percentage of the total cost of power.

In this connection it is interesting to note that the Westinghouse Electric and Manufacturing Co., builder of the machine described, was recently awarded a gold medal at the Panama-Pacific International Exposition for the general excellence of the locomotive of this type which it exhibited. This would appear indicative of the place which the judges consider is open for these combination locomotives.

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Operator's Liability for Certified Miner's Negligence—Plaintiff, a laborer in a Pennsylvania anthracite mine, was directed by his superior, a certified miner, to break up a large rock which had been thrown out. This direction was given after the miner had inspected the place and in assuring plaintiff that there were no unexploded shots in the rock. In attempting to break the rock, plaintiff exploded a cap or a quantity of dynamite and was blinded. He sued the employing operator in a New York court, which in upholding his right to recover says: "I think that the presence of dynamite or a cap which, like dynamite, would explode from concussion in a place where a workman is directed to strike with a steel tool is evidence of negligence in setting him at work there in that way." Operators are exempt from liability for negligence of certified mine officials only so far as the carelessness relates to acts within the scope of statutory duties of such officials; so far as an official acts beyond these duties he is the representative of the operator, who is liable for resulting injury to employees. (New York Supreme Court, New York County Trial Term, Martinkovics vs. Lehigh Coal & Navigation Co., 154 New York Supplement, 178.)

Extracts from a Superintendent's Diary

Our prize first-aid team is in disgrace. They went to the "state-wide contest" to represent us and returned home without even notifying the judges that they were in town.

Yesterday they started off bright and early, all dressed in spotless overalls to take the first train into the city (they were afraid that dressing rooms would not be provided at the grounds so they decided to take no chances), and today they returned still conspicuous because of the overalls, but the desire to let their fellow townsmen see them on parade had entirely vanished.

The "patient" of the team (Jim Harper) made the first false step in the ill-starred adventure. He accepted an invitation to take a drink with a former resident whom he happened to meet almost as soon as he arrived in the city, and from that time on he forgot what he had come for and soon slipped the collar. His team-mates, fearing that he would feel his importance too much, had led him to believe the night before that anyone could act as "patient," so he had not left camp bristling with his own importance as had the other five members of the party, and it is not surprising that a few drinks made him forget entirely the main adventure of the day.

When the others realized that the "patient" had wandered off, they roamed about town in search of him and soon found themselves in parts of the city where men dressed in overalls and miners' caps attracted more than passing notice. Soon a motley crowd of street urchins collected at their heels hooting at them and subjecting them to a torrent of sarcastic remarks.

The men took it all with good grace for a time, but finally the remarks became too personal, and Sandy McArthur, captain of the team, lost his temper and, turning about, waded into his tormentors and gave them something to howl about.

The street became alive with patients needing first-aid treatment, but the first-aid squad overlooked its opportunity completely and stood silently by, while its captain inaugurated a reign of terror.

About this time an officer of the law chanced upon the scene and, realizing at a glance the seriousness of the crisis, rushed to the nearest alarm box and sent in a riot call.

Just what happened immediately after the arrival of the police reserves must remain a matter of conjecture until we can obtain evidence not now available. Several hours later the chief of police managed to reach me on long-distance telephone, and I succeeded in getting the team members released on bail, but the information that he gave me does not exactly tally with the narrative of our men, so I have decided to reserve judgment.

By the time the men were released from custody, only a few minutes remained until the time for the first-aid meet to begin, so the chief, realizing their predicament, kindly offered to send them to the field in the police patrol auto, and they accepted his invitation.

But in that, Fate again willed otherwise. Hardly had the automobile started on its journey when in turning a corner it collided with two men, one of whom proved to be the traitorous "patient." When the occupants of the auto got to him he was in need of all of the first-aid talent they possessed, and instead of continuing the journey to the first-aid meet, they were compelled to hurry to a hospital.

Jim's wife was at the station to meet him today when the train rolled in, much to his dismay, and judging by the conversation that drifted back over the hill long after Jim and his wife had faded from sight, Jim may require further first-aid treatment from his team-mates before today's adventure is entirely forgotten.

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Illinois Mining Institute

Special Correspondence

The Illinois Mining Institute held its third annual meeting in the City Hall, Springfield, Ill., Saturday, Nov. 20, beginning at 9:30 a.m. Mayor Baumann welcomed the institute to the city, and the president of the association, J. W. Stark, state mine inspector, of Georgetown, replied and also welcomed the members.

State Mine Inspector David Z. Thrush read a paper upon the topic, "The Mine Manager," which brought out so much discussion at the morning session that upon the request of a number of members who came in during the discussion but after the reading of the paper, it was also read at the afternoon session. Those who took part in the discussion that followed were Thomas Moses, general superintendent, Bunsen Coal Co., Westville; John P. Reese, of the Superior Coal Co., Gillespie; Mr. Burton, of Herrin, a board member of the U. M. W. A.; Mr. Patrick Hogan, and the newly elected president of the institute.

Mr. Burton started the discussion and urged the advisability of getting greater efficiency from the men at the face, saying that in his opinion too much attention is now given to improving the efficiency of company and surface men. Mr. Reese and others held that at present miners are content to earn a less daily wage than they are capable of earning with greater exertion, and that it is difficult to increase the general efficiency of the mine by increasing the output per man beyond this moderate wage. Though different machine loaders have certain rate advantages enabling them to make better wages under certain conditions than other loaders, most of the loaders seem satisfied to make the same average wage and cannot be forced to increase their earning power. It was also claimed that men working three days per week produce more per day than those working six days, and some argued that the six-days-per-week men should increase their daily average to the same amount as the three-days-per-week men. Others opposed this proposition and argued that a man always works harder for part time than if working steadily. This friendly discussion between prominent operators and officials of the miners was most interesting and illustrated the good effects of the mining institute.

The director of the State Geological Survey, F. W. De Wolf, read a paper entitled "Relation of Oil and Gas Wells to Coal Properties," and showed by illustrations several methods proposed by a committee of geologists, engineers and mining men for plugging oil and gas wells that penetrate coal measures. John P. Reese gave an interesting account of the controversy now in progress in the Staunton district of Illinois, caused by the discovery within the past year of oil and gas wells in territory where coal mines are now operating or are projected in the near future.

At the afternoon session, after the rereading of Mr. Thrush's paper, an address entitled "Cleanliness and Order at Coal Mines," by G. E. Lyman, mining engineer of the Madison Coal Corporation, was read by the secretary in the absence of the author. The great waste at many mines owing to disorder was pointed out, the economy of greater order was shown, and also the income available by selling the large amount of scrap that usually is found about mine works. The ideas advanced by Mr. Lyman seemed to be heartily indorsed by a number of speakers.

The following officers were elected for the ensuing year: President, Mr. Burton, of Herrin; first vice-president, Mr. Fehler, of Belleville; second vice-president, Patrick Hogan, of Canton; secretary and treasurer, Martin Bolt, Springfield; executive committee, Messrs. McClintock, Stark, Reese, Simpson and Bolander.

The City of Herrin in southern Illinois was chosen as the place for the next meeting after a spirited contest between Herrin and Duquoin. The president appointed as an auditing committee, Messrs. Fehler, Hogan and Stoek. At the banquet held at the St. Nicholas Hotel at 6:30 p.m., John P. Reese, of Gillespie, acted as toastmaster. The program included toasts by Messrs. David Ross, Bolander, Stark and others and songs by Mr. Hogan.

Pages from a Miner's Notebook: Caste and Cleanliness

I moved next door to the tipple boss recently. He is one of the men employed here who advised me not to join the bathhouse club. "Only the rough-necks wash there," he said.

He came home from work tonight. Behind him came a crowd of the rough-necks. They stopped at the bathhouse, which is a model of cleanliness and convenience, and in a few moments were on their way to their homes, washed, dressed in clean clothes and with their pit clothes hung high up to the ceiling in a good draft of air where by morning they will be dry and well freed from the dampness incident to perspiration.

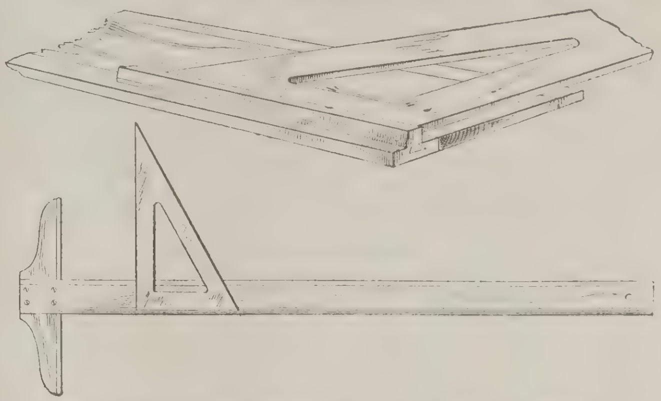
The tipple boss sat on his front steps in his pit clothes, without even washing his hands and face, until long after the roughest rough-neck was comfortably ensconced on his own front porch or busily engaged in his garden. He sat there until his wife called supper, when there was a great rushing about to get into clean clothes. His pit clothes were piled in a corner on the back porch, and he washed hastily in a tub of water which his wife had been forced to draw for him during the heat of the afternoon. Supper was cold and his wife was aggrieved at being kept waiting, which is no wonder, according to my wife.

The clearing away of the table and washing of dishes was late, naturally, and while the rough-necks and their families were on their way to the moving picture show the tipple boss sat waiting for his belated wife, blaming her all the while for being so extremely slow in finishing up the housework.

I wondered at the time just what satisfaction the tipple boss secured from that exclusiveness which prevented his taking his evening bath in the same room or possibly under the same shower as the rough-neck, and I am still wondering.

Device for Inking Over Freshly Drawn Lines

A T-square with three working edges on the bar has recently been patented by E. R. Ruehle & Co., 119 Fulton St., New York City. The third edge is furnished by a stop along the bar. By means of this addition the draftsman's triangle can be slid along the board, but held clear of the tracing, so that additional ink lines can be placed on a drawing without waiting for any fresh lines beneath to dry.—*Engineering and Mining Journal.*



T-SQUARE FOR INKING OVER FRESH LINES

Ravensdale, Wash., Disaster

The worst coal-mining disaster which ever happened in the State of Washington occurred on Nov. 16 at the Ravensdale mine of the Pacific Coast Coal Co., lessors from the Northwestern Improvement Co., a subsidiary of the Northern Pacific Ry. Co., when an explosion the cause of which is yet unknown killed 31 miners working in the third level. Three miners working in the second level were rescued. The shaft, which descends to the mine at an angle of 60 deg., was completely choked by débris between the second and third levels, but by using an auxiliary slope, rescue crews were able to penetrate several hundred feet along the third level. The ventilating shaft and fanhouse were undamaged by the explosion, and this fact permitted the rapid clearing of the air, thus enabling the rescue teams, which came from practically every mine in the district, to do rapid work.

Following his inspection of the mine, State Mine Inspector Bagley stated that so far as he was able to penetrate the auxiliary slope he had not discovered the center of force of the explosion. The mine, he said, was one of the best equipped in the state for the protection of the men working in it. He has visited the property on numerous occasions, the last time being less than a month ago, "and at all times found it meeting every requirement and better provided than the state law required." It was equipped with a sprinkler system, and the third level had been sprinkled on the Sunday preceding the explosion.

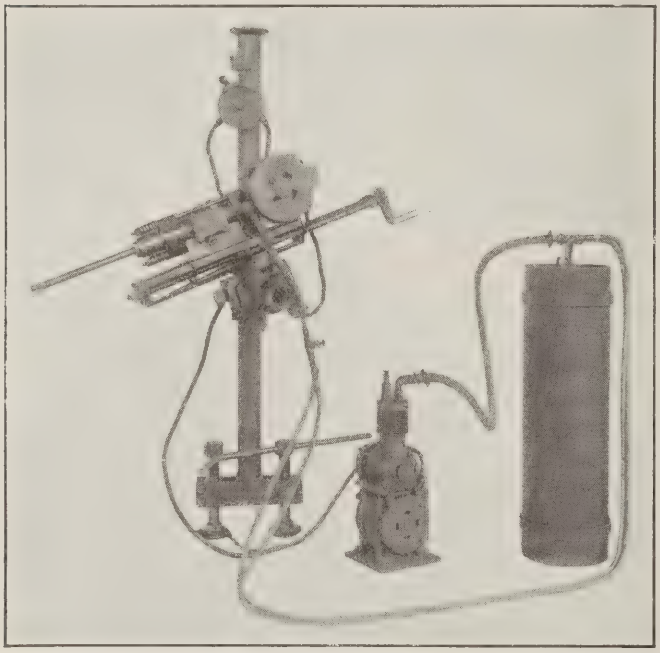
It has been fairly well established that the explosion occurred in the third level east entry. The east and west entries of the third level lie at right angles with the main slope at its bottom. The first is 2,850 ft. long and the second about 2,600 ft. long. The majority of the miners were working in the east entry drawing pillars within 400 ft. of the main slope. It was stated by a miner, who quit early, that the miners drawing pillars fired their own shots and perhaps one of these was poorly placed.

New Apparatus and Equipment

Denver Electric Rock Drill

After several years of practical demonstration, the Denver Rock Drill Manufacturing Co., Eighteenth and Blake Sts., Denver, Colo., has finally put upon the market under strong guarantee a new electrically operated rock-drilling machine. This drill has been built upon principles that have been found thoroughly practical.

The new drills are made in two sizes—one of 2 hp. and one of 4 hp. The structural features in both are identical. The machine is a self-contained, direct-connected unit. The equipment also includes a small auxiliary electrically driven air compressor and an ordinary drill-water tank. Neither compressor nor tank, however, is essential to the operation of the drill proper, but is needed only in the cleaning of the drill hole and in supplying water for drilling.


DENVER ELECTRIC ROCK DRILL AND AUXILIARIES

Each unit is built as light as is compatible with durability and is designed for muleback or horseback transportation when necessary. The claims made by the manufacturers for this drill are its endurance, its drilling speed, its freedom from "fitchering," or sticking, and its low power consumption. It is free from all freezing troubles, and the cost of a complete installation is comparatively small. This renders it particularly suited to remote mining localities where fuel is expensive.

As may be seen in the illustration, the drill motor is mounted behind the drill mechanism proper. It is compact and fully inclosed against dirt and moisture, as well as shock. The coils of the motor are made into compact, solid units, with insulation baked on, thus rendering the coils secure against deterioration from vibration. The motor shaft runs in ball bearings, and the power is delivered to the drill mechanism through an internal reduction gear. The machines are built to operate on three-phase 60-cycle alternating current of 110, 220 or 440 volts' tension. There are consequently no brushes or sliding contacts.

The main portion of the drill comprises two cylinders mounted side by side. One of these contains a piston serving as the pulsator, which is driven by a connecting-rod from the motor gears. This pulsator compresses air in both ends of this cylinder and forces it back and forth into the corresponding ends of the hammer cylinder, where it causes the latter to oscillate with the pulsations of air.

The hammer has a 4-in. travel. As the air is not exhausted from these cylinders, but is drawn back and forth repeatedly, being alternately subjected to compression and suction, it does not become heated, and hence no cooling arrangements are necessary. The pulsator cylinder is provided with a bypass valve, by means of which the operator may instantly cause the pulsations of air to take place between opposite ends of the pulsator cylinder, thus stopping the hammer, or he may adjust the blow of the hammer to any desired intensity.

The drill strikes about 1,200 blows per minute, and the regulation of cutting speed is entirely by means of the bypass valve. It is not necessary, owing to this bypass, to shut off the current in order to interrupt the action of the machine.

Rotation of the drill steel is accomplished by a ratchet and slip-friction set of gears, driven directly from the motor. The steel therefore turns when the hammer is stopped, and in this condition the machine may be used as a boring tool. The steel employed is round and hollow. A portion of the shank about an inch long is swaged square to fit the socket of the drill. The quantities of air and water admitted to the steel are governed independently by valves. The feed is by means of the ordinary shell and screw mechanism. Lubrication of the drill is positive and simple. It is practically impossible to lose a drill hole with this machine.

The electric switch governing the machine is constructed shock-proof. Movement of the handle to the first notch starts the compressor running, while movement to the second notch throws the drill motor into action.

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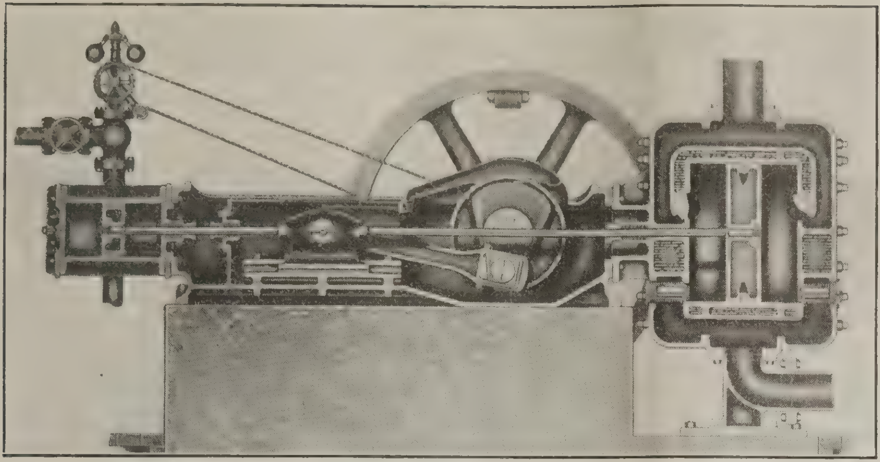
A New Vacuum Pump

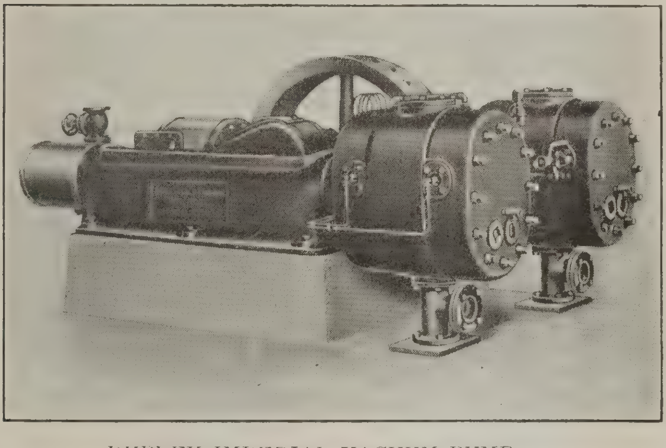
The degree of advantage obtained from the use of condensing apparatus is dependent upon the vacuum maintained. For the purpose of securing and maintaining a high vacuum, the Ingersoll-Rand Co., 11 Broadway, New York, has recently introduced a line of steam- and power-driven duplex-type Imperial vacuum pumps.

Differing from the usual design of such machines, the intake valves in the vacuum cylinders of these pumps are of the corliss type and so placed in the cylinder head that the clearance is extremely small. This is a desirable feature in that air trapped in the clearance space



SECTION THROUGH IMPERIAL VACUUM PUMP

at discharge pressure will not reach such a volume upon expanding to intake pressure as to greatly limit the pressure reduction which may be obtained. The action of this valve is positive and rapid, being independent of the cylinder and intake pressures. The intake ports are large and direct. This, together with the water-jacketing of the valve, tends to cool the intake gases. The discharge valves are of the direct-lift poppet type and are placed in the bottom of the cylinder heads so that any entrained moisture or water is immediately discharged. Clearance at the point of discharge has been reduced by making the valve partially fill the port in the cylinder head. The discharge passages are also water-jacketed. The low clearance space in these vacuum pumps has been obtained, not by permitting the piston to come into dangerously close proximity to the cylinder head, but by a careful design of the valves and valve ports. Owing to the extremely low clearance, the complete water-jacketing, the corliss inlet valve and other refinements of design, the manufacturer guarantees the easy maintenance of a vacuum within 1½ in. of the barometer.



DUPLEX IMPERIAL VACUUM PUMP

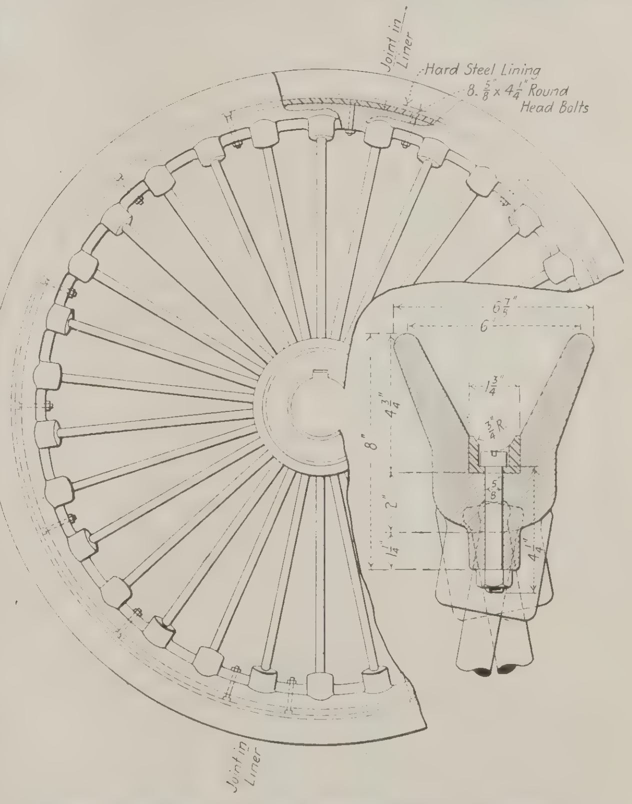
Lubrication of these machines is by the bath system, providing flood lubrication, yet retaining by the removal of covers from the casing a high degree of accessibility. When in operation the flywheel is practically the only visible moving part, yet the entire mechanism is readily accessible while in motion.

In reality a duplex machine, such as this, is two identical units of like capacity united by a common frame and a shaft with two cranks at 90 deg. from each other. This makes it possible, should requirements fall temporarily below that for which the machine was originally installed, to remove one connecting-rod and continue operation with one-half of the machine idle, while the other half of course works at its utmost efficiency, but removes only one-half of the air and vapor handled by the entire machine.

These machines are built in capacities from 795 to 7,048 cu.ft. per min., both for atmospheric and low-pressure discharge. It is claimed by the manufacturer that these pumps operate practically independently of attention and are thoroughly efficient and economical machines for maintaining a high vacuum in practically any type of condenser.

A New Type of Sheave

It is almost the universal practice at coal-mine shafts to lead the cables from the hoisting cages over sheaves on the headframe and thence to the drums of the hoist. The cable is thus caused to follow and bend around the rim of the sheave for a distance of almost 180 deg. As a result of this bending and the consequent slight slipping and working of the cable strands upon themselves and upon the sheave the wear upon the rim of this wheel is considerable.



NEW SHEAVE WITH RENEWABLE LINING

To lessen the wear upon the sheave rim as well as to render easy repairs thereto possible, the Litchfield Foundry and Machine Co., Litchfield, Ill., is offering to the coal-mining industry a sheave with a renewable wearing rim of hard steel, as shown in the illustration.

As may be seen, this renewable rim is made in halves, each of which is held in place by eight ⅝x4¼-in. special bolts. It is thus an easy matter to remove a worn liner and replace it with a new one, making the sheave practically as good as at first. With a headframe equipped with sheaves of this type, it should not be necessary to carry an extra sheave as a spare, a pair of sheave liners answering every purpose.

The "Simplate" Valve

To insure higher mechanical and volumetric efficiency and to simplify air-compressor cylinder design, the Chicago Pneumatic Tool Co., 1080 Fisher Building, Chicago, Ill., has recently placed on the market the "Simplate" valve, which is of the flat-plate design. The valve has several distinctive features and the chief advantages claimed for it are that it is simple; that its plates are independent in action, one of another; that each plate has its individual springs; that the tensions of the springs on the inlet and discharge valves differ according to the density of the air handled: and finally, that it is applicable to all positions and conditions.

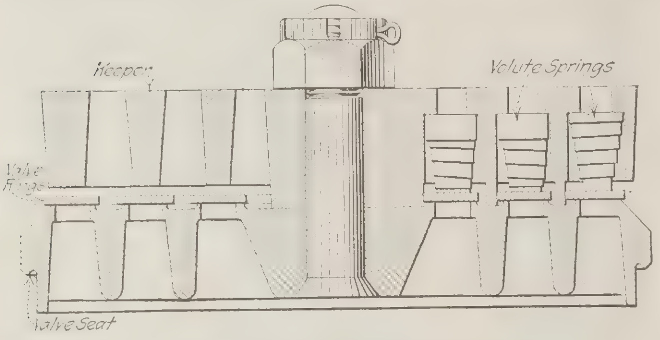


FIG. 1. "SIMPLATE" DISCHARGE VALVE

Fig. 1 shows a section through a discharge valve. The seat is cast from a special alloy steel, heat-treated, oil-tempered and ground true on one side. As shown in the illustration, the seat has circular ports and it is machined so that the raised portion, or the point on which the plates rest forming the joints, is narrow, thus reducing the unbalanced area of the valve. The keeper is of the same material. It is provided with suitable ports for the free passage of the air through it and also furnishes guides for the valve plates and pockets for the valve springs. The latter are of the volute type and are made of high-grade crucible steel. The valves are simple concentric steel plates of uniform section, with a separate and independent plate over each port. Each plate is independently governed by its own spring, hence the action or opening of each valve is entirely independent of the other. Should one of the plates open, the next one to it does not need to move unless the speed conditions should demand it. Ordinarily the outer plate opens when the compressor is running at slow speed, when running at intermediate speed two plates operate, and at full speed all valves are open. The parts making up a complete valve are assembled and held together by a nickel-steel stud and castle nut, and when this nut is tightened in place it is held by the cotter pin.

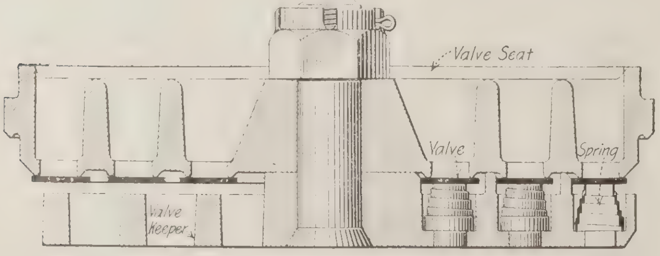


FIG. 2. "SIMPLATE" INLET VALVE

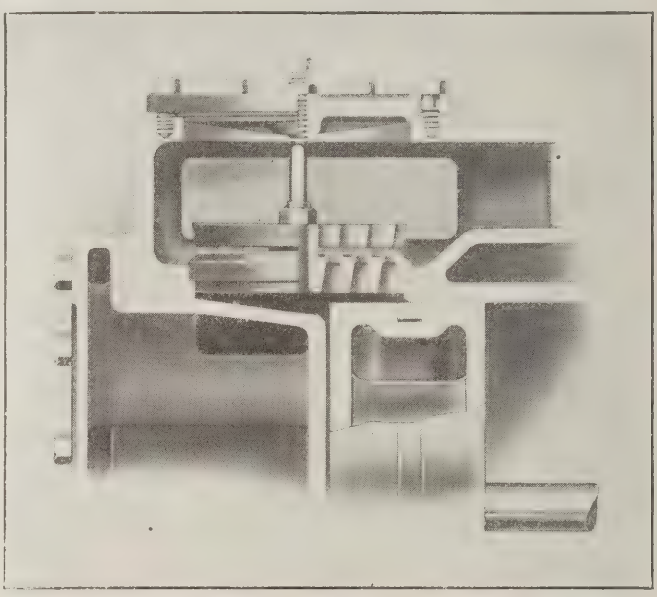


FIG. 3. POSITION OF VALVES IN AIR CYLINDER

As shown in Fig. 2, the construction of the inlet valve is similar to that of the discharge valve. It differs in that the keeper is thinner and the springs have lighter tension. On account of this difference in thickness, inlet and discharge valves cannot be reversed. The spring tension on the inlet valves is light in order to derive the full benefit of the various openings of the different plates when the piston speed is changed. For example, with an inlet valve of the size shown herewith, the spring tension is so calibrated that the outer plate opens with a pressure of but ¼ oz. per sq.in., while 1 oz. will open the intermediate plate and 2½ oz. the inner plate. The valves are said to be noiseless in operation, and their location in the cylinder is convenient for examination or repair, as indicated in Fig. 3. Top and bottom views of the valve are shown in Fig. 4. It is equally suited to high- and low-pressure work and requires no lubrication. A feature worth noting is that all valve parts are interchangeable.

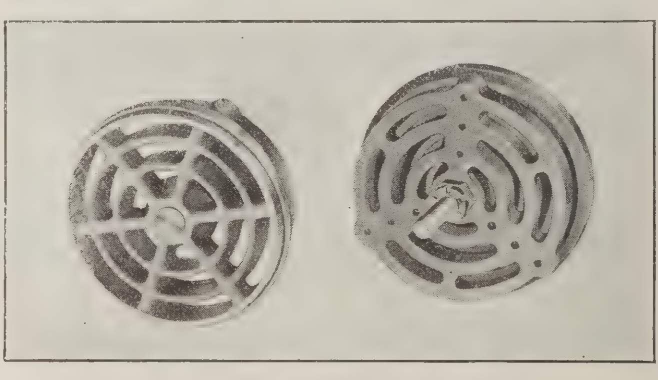


FIG. 4. THE "SIMPLATE" VALVE

Who's Who in Coal Mining

T. M. Dodson

A number of young men are coming forward and fast filling positions of trust and importance in the anthracite field. Some of them have chosen the coal business as a lifework merely by accident. Others have been bred and born to it, and such a one is Truman Dodson, one of the youngest general managers of hard-coal mines.

Mr. Dodson's forbears were interested in coal mining a long time ago, and the black mineral was introduced to him at an unusually early age. It isn't always that sons of fathers can truthfully be called "chips of the old block," but such an appellation fits "Trot" Dodson, for starting as a most unimportant cog in the organization of the Dodson coal interests, he has won the respect of all his associates and risen to his present post of authority by giving close attention to the work at hand.

TRUMAN MONROE DODSON

Mr. Dodson was graduated from Lehigh University in 1900. Following the completion of his college training, he was given employment in West Virginia at the mines of the Garrett County Coal Mining Co. and the Monroe Coal Mining Co. at Barnum. These operations received his undivided attention until 1904, affording him a broad experience in the primary essentials of the mining business. Leaving West Virginia, he became manager of the mines of the Weston Coal and Coke Co. and the Osceola Coal and Coke Co. at Osceola Mills, Penn. Here he remained for two years, after which he moved to Morea Colliery, Penn., to become superintendent of the large Morea and Kaska William collieries.

After receiving valuable experience as mine superintendent at Morea, Truman Dodson in 1907 was appointed general manager of all the Weston, Dodson & Co., Inc., coal and mining interests, including the Beaver Brook colliery at Audenried, Penn. The large output and the many important improvements at the Dodson mines in recent years bear witness to the effective management of Mr. Dodson. A large part of his attention at the present time is being directed to improving the environments of his employees. A new and modern mining village that is now being erected at one of his collieries is an evidence of his interest in sociological work.

"Trot" Dodson is the sort of young man who doesn't need to stretch his imagination to realize that coal mining is a business with aims and ideals other than the payment of dividends and the accumulation of a fat surplus reserve. He is modern in his ideas, human in his instincts and charitable in his practices—the sort of fellow who can be fair to himself and those he serves without forgetting or overlooking the rights of those who serve him.

Mr. Dodson is a member of the American Institute of Mining Engineers and an enthusiastic alumnus of Lehigh University. He is at present general manager of five large coal companies controlled by the Dodson family and those associated with it in the mining business.

Recent Legal Decisions

Reasonableness of Intrastate Coal Freight Rates—In fixing intrastate freight rates on coal shipments, a state railroad commission may validly use as a basis voluntary intermediate rates established and long maintained by railroad companies. (Kansas Supreme Court, Union Pacific Ry. Co. vs. Public Utilities Commission, 148 Pacific Reporter, 667.)

Operator Not Liable for Independent Contractor's Negligence—Where a mining company employs a contractor to construct a tunnel according to specifications, and he is left free as to the means and methods of doing the work, the company cannot be held responsible for injuries to one of his employees, caused by discharge of a "missed hole" and due to the negligence of the contractor in failing to warn the employee against the danger or to promulgate rules to prevent such accidents. (Utah Supreme Court, Dayton vs. Free, 148 Pacific Reporter, 408.)

Imputed Notice to Corporations—Although a corporation is not chargeable with notice given one of its employees concerning a fact not within the scope of his employment, a company engaged in selling coal is chargeable with notice given its assistant sales agent that defendant would no longer guarantee payment for coal delivered to a third party, where the principal sales agent of the company was absent and the assistant was apparently in charge of the corporation's general offices. (Washington Supreme Court, Canadian Collieries, Ltd., vs. Humphrey, 148 Pacific Reporter, 573.)

Operator's Liability for Gas Explosion—Where a gas explosion in a mine was attributable to negligence of the fireboss in failing to make proper inspection, the operator's liability for injury to a miner is not affected by previous negligence of the miner in failing to pierce an opening through a horseback so that the boss could get through to make inspection, nor by the fact that the day before the accident the injured miner disregarded a warning to stay out until arrival of the fireboss. (Kansas Supreme Court, Oplotnik vs. Cherokee & Pittsburgh Coal and Mining Co., 148 Pacific Reporter, 616.)

COMING MEETINGS

American Society of Mechanical Engineers will hold its annual meeting Dec. 7-10, 1915, New York City. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

Coal Mining Institute of America will hold its winter meeting Dec. 21-23, 1915, at the Fort Pitt Hotel, Pittsburgh, Penn. Secretary, C. L. Fay, Wilkes-Barre, Penn.

Engineers' Society of Western Pennsylvania holds its monthly meeting third Tuesday of each month; section meeting, first Tuesday. Secretary, Elmer K. Hiles, Oliver Building, Pittsburgh, Penn.

Western Society of Engineers, Chicago, Ill., holds its regular meeting first Wednesday of each month, excepting July and August. Secretary, J. H. Warder, 1785 Monadnock Block, Chicago, Ill.

The Labor Situation

SYNOPSIS—Trouble at Lehigh Coal and Navigation Co.'s mines ends. At Maryd, Penn., of the Maryd Coal Co. men all but 12 are at work. The Madeira-Hill Coal Mining Co. and the Rochester & Pittsburgh Coal and Iron Co. have strikes at their mines. In Ohio, J. T. Daniels testifies that the rate from Corning to Toledo is 33c. too high.

For the first time in many weeks the collieries of the Lehigh Coal and Navigation Co. in the Panther Creek Valley have been able to work a whole week without a strike of any kind. The miners working for this company have gone on strike and returned to work without any conference with either the union leaders or the company officials. They appear to stay at home till they are tired and then they go back to the mines.

In Maryd, near Tamaqua, Penn., the miners of the Maryd Coal Co., a subsidiary of J. S. Wentz & Co., have objected to a certain portion of the mines being operated with the aid of safety lamps without the men being remunerated for what they regard as a handicap. At first the men all went on strike, but this method of attack seemed more grievous to the miners than to the company, and the employees have now made up their minds to return to work, but to pay the living expenses of the 12 men whose work would normally be in the safety-light zone, but who by orders of the miners and their own inclination are now idle.

The employees working for the Madeira-Hill Coal Mining Co. allege that the company is violating the 1912 agreement for certain kinds of underground work. So 800 men and boys went on strike at the Stanton colliery on Nov. 23. The officials of the United Mine Workers are endeavoring to effect a settlement. Of course, such a strike is in violation of the ruling of the arbitration commission.

Want Higher Wages in Central Pennsylvania

The members of the United Mine Workers of America employed at the Rochester & Pittsburgh Coal and Iron Co.'s mine at Adrian (post office Delancey), Jefferson County, Penn., went on strike on Nov. 20, and the miners at the Florence mine of the same company laid down their tools in sympathy. The loaders want 45c. instead of 37.5c. per ton for loading coal and a day instead of a ton scale in the headings. The miners ask for $3.30 per day in wet headings and $2.64 where these places are dry.

The company has informed the miners that a strike is a violation of the agreement. A strike for increased wages is particularly discreditable to the organization, seeing that the contract provides for the maintenance of the scale till April 1, 1916.

It should be stated, however, that the miners claim that the headings in Adrian had become abnormal and that a new scale should be provided to meet the new condition. James Marks, a board member of district No. 2, says that the Florence strike was not in sympathy with that at Adrian, but that the miners struck because the company was violating the contract in every particular. About 700 men in all are affected.

At the Florence mine near Martins Ferry, Ohio, operated by the Youghiogheny & Ohio Coal Co., it is stated that the mine foreman asked four men to work 5 min. after quitting time, using unprintable language when the men failed to acquiesce. The foreman was attacked by two or more men, and as a result a trip-rider and three electric locomotive men were discharged. As a result 350 men went on strike in violation of their contract by which striking is forbidden.

The labor situation in Ohio and West Virginia still centers round the uncertain freight-rate question. The West Virginia people somewhat generally believe that the firm stand of the Chesapeake & Ohio Ry. in demanding an increase in western Pennsylvania rates as large as the increase in Ohio rates has made Pennsylvania and West Virginia a unit in demanding a maintenance of the present freight rates. They regard the action as quite shrewd and feel assured that the final rates will give Ohio only a trifling advantage in the market and Pennsylvania none at all, but rather an inferior position.

It now develops that coal shippers, who expected to get refunds from the Hocking Valley Ry. Co. for the difference between the old and the new rates, which amounts to 15c. per ton, will have much to do before they are reimbursed in full. The railroad company is now litigating its liability for the refund in question.

The Hocking Valley Ry. Co., in July, 1911, sought by a suit to stop the enforcement of an order which had been made by the Public Service Commission of Ohio. The company lost the suit in September, 1915, and the rate was cut from $1 to 85c. Shippers have been expecting a refund of the 15c. overcharge. Not all the claims have been filed, but coal men have estimated that they would aggregate about $200,000.

When the litigation was opened, the court hearing the case required bonds to be filed by the company to protect shippers in case the rate was found to be too high, and as a result the company was bonded in the aggregate sum of $33,000. The position and claim of the company was made plain in an answer filed with the utilities commission, in which it held that its financial liability for refund to shippers was limited to the security which the court had required. It took the position that if the claims exceeded the bonds the money could be prorated among the claimants.

The company took this position in an answer to a claim of $264 made by T. E. McElfresh, of Delaware. It asked for the dismissal of the suit by the commission for lack of jurisdiction and set forth that the whole matter was a piece of litigation in the courts and that the bonds were given under court orders. The bonds were not and never were under the direction or control of the commission. The claimants, the road's counsel contends, must go to the courts.

Under the law any rate judicially determined is to be the just and legal tariff for one year. The question is to be brought up if the claims may be filed for the entire period of the litigation or only for the year during which the rate is free from legal attack. That is still another limitation that may be urged against the claimants for refund.

The coal-rate case ending before the Ohio Utilities Commission which is being prosecuted by the Sunday Creek Coal Co. and the United Mine Workers of America in Ohio was resumed last week after a long recess which was allowed so that the evidence given might be tabulated. It was disclosed in the hearing that the defendant railroads, the Hocking Valley Ry. and the Toledo & Ohio Central Ry., will take at least a week in the defense and probably longer. The case will be bitterly fought on both sides and the recent action of railroads in Middle West territory will have no bearing on the prosecution of the case. The complainants rested their case Nov. 23, although they will probably call witnesses in rebuttal.

Rates Should Be Lowered 33c. per Ton

The first witness to take the stand after the three weeks' recess was W. M. Hopkins, of Chicago, the rate expert retained by the Sunday Creek Coal Co. He was reëxamined as to the exhibits he had prepared to show the alleged injustice of the present 85c. rate on the Hocking Valley Ry. from the Nelsonville assembling yards to Toledo. His testimony on these documents closed the Sunday Creek case against this defendant. The witness was continued on the stand, however, to explain exhibits he had submitted in the attack upon the rates from Corning to Toledo over the lines of the Toledo & Ohio Central Ry., co-defendant in the case.

A forceful witness was found in J. T. Daniels, of Columbus, a former freight-traffic man, but now engaged in rate-expert work. His exhibits were confined to showing what the Corning-Toledo rate would be if based on the same ton-mile charge as rates from various West Virginia, Kentucky and Tennessee fields into Toledo. He had also submitted exhibits in the testimony against the Hocking Valley Ry. The contention of both Hopkins and Daniels was that the Corning-Toledo rate, including assembling and terminal expense, should be about 67c., instead of $1 as now in force.

Farmers Will Try Accused Colorado Miners

Nearly 100 cases arising out of the rioting in Huerfano County will be transferred to the district court at Castle Rock, Douglas County, Colo. This is the center of a farming, dairying and stock-raising section. The only mining interest is limited to quarrying.

The county lies between Denver and Colorado Springs. The court is presided over by Judge Dennison, who has been appointed to try the cases instead of Judge Hillyer, who was debarred from sitting in judgment in these trials by the Supreme Court of the state. State Attorney Farrar agreed to the change which was requested by Attorney Hawkins, the chief counsel for the United Mine Workers of America.

Editorials

Wake Up!

The anthracite fields have always been conservative. They have been far separated from the bituminous districts in miles and in topography, but much farther in thought and custom. Years ago the bituminous fields became overdeveloped, and the operators were forced to try everything that promised any economy of production if they wished to remain in business. They tried a great many things that did not fulfill their promises, but some of the things stuck. This is true of methods as well as of appliances. Nowadays anthracite is being pushed very hard in the market by bituminous coal and the anthracite operators must adopt every possible economy if they expect to retain a fair share of the business. There are some fields in which they cannot compete with soft coal (they cannot reach most of the steam markets, for instance), but anthracite has qualities which make its use highly desirable for some purposes.

If the anthracite people wish to retain their place in the fuel industry, they will have to fight for it and fight intelligently. They need to employ the most economical methods of production. They need to ship clean coal and nothing else. They need to clean it and size it efficiently and cheaply, by machinery as far as possible. And they need to show people how to use it; for there is no doubt that a large market is being lost which might be saved if the anthracite producers would teach people how to use coal. There ought to be a research bureau in the anthracite field devoted to the investigation of the properties of different hard coals and the proper ways to use the different coals and different sizes.

The anthracite people need above all to get away from a conservatism which is not the dignity of conscious rectitude, but merely the fear of innovation. They need to get up and hustle, and it looks as if they would have to do it very soon. Some of them are doing it now.

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Will Mine Foremen's Certificates Be Necessary?

So many letters have been received asking whether mine foremen's certificates will be necessary in Pennsylvania after the New Year that it seems a few words might be desirable. The answer is "By law, no, and in practice, yes."

West Virginia has had certificated men for years, but until May 6, 1915, the state left it to the judgment of the operator whether he employed such men or satisfied himself with those who had not qualified. To his credit, be it said, the West Virginia mine owner rose to the occasion and in most cases employed only certificated men. A competent man always has his value, and the operators recognized that the certificate at least bore evidence as to qualifications along certain lines, though it told of course almost nothing about administrative ability.

But there is another view of this matter. We may well suppose that the State Workmen's Insurance Fund, the various private corporations undertaking liability insurance and the mutual insurance companies will all demand that the mines be run in a safe way. They will not be content to have an uncertificated man in charge. In fact it looks as if the act permitting uncertificated men to manage mines is nullified by the compensation bill and by the act creating a state insurance fund. That latter enactment clearly gives the State board a right to say what precautions shall be taken, for it says that "the board shall make reasonable rules and regulations for the prevention of injuries upon the premises of the subscribers, and they may refuse to insure, or may terminate the insurance of, any subscriber who refuses to permit such examinations or disregards such rules or regulations and may forfeit one-half of the unearned premiums previously paid by him."

What more reasonable rule can there be than that there should be a certificated foreman in charge of the mine and indeed that he should be in control? It may not be legally necessary for operation and yet absolutely mandatory for insurance. The man who insures with the State board has put his burden on the state in return for certain payments based on his payroll, and he has agreed to follow its requirements. Consequently the constitutional provision which inadvertently relieves him from responsibility if he employs one of a group of men certificated by the state no longer has any power.

He has entered into a contractual relation with the state in which he agrees to put a man in charge and that man a certificated man, and in return and for certain other valuable consideration the state agrees to provide from its funds for compensation. The operator could deal with some other concern than the state as with a private or a mutual company, but he does not. With his own free will he makes an arrangement with the State board, and it is such a one as the board decides to make. It hardly seems likely that the courts will rule that the State Insurance Board can lay no heavier burden on the coal industry than is provided by the provisions of the statute law relating to mines.

Perhaps, after all, the state of innocuous desuetude will be not that of the certificated foreman, but of the mine inspector. It is a serious question to this body of efficient men whether their occupation will not be gone when the State board and the private companies are making more stringent rulings than the mine inspectors are allowed to make under the statute law. Such companies as the Susquehanna Coal Co. and the H. C. Frick Coke Co.—though it is not fair to select these two from many others doing excellent work—already make inspection largely vain. What will happen then when all the companies will say to the inspectors, "Our mines are inspected under a more stringent rule than yours; more onerous conditions are met than you are allowed to impose and there remains absolutely nothing under the law which you can require of us?" When this becomes general the trade of the mine inspector as an official to enforce the law will be gone, and he will be replaced by the man who is authorized to demand that the arbitrary rules of the State board and insurance corporations be followed.

The complaint has been somewhat general that the letter of the law is being followed by the inspection service and not the spirit of the enactments. It is doubtless true, for the inspectors are bound to follow the law verbally because the judges and juries to whom they will be answerable for any neglect are bound by the letter of the statute.

In clear contrast with this state of affairs in the state inspectorate will be found the conditions under insurance inspection. The inspectors of the insurance authorities will be able to get reasonable interpretations on the rulings of their central offices. An order issued by such an office can be modified in a week, whereas a new law may take three years.

In fact the operator will find conditions in the future more as they are in Great Britain and Canada. There, orders in council are issued which have the value of laws and supplement the statutes. They are arbitrarily imposed and more grievous than the statute law, but they can be modified by the power that issues them if they prove unfair or unsatisfactory.

If the Pennsylvania operators had been face to face with an order of council or the ruling of an insurance company when they were required to drill gas holes ahead of their operations, they would have found a more elastic correctible instrument than the law of June 9, 1911, against which protest and reason are alike vain.

Cape Cod Canal's Usefulness

Although the Cape Cod Canal has been open more than 15 months, there is still a divided opinion as to its usefulness. So far it has not had an opportunity to serve any vessels from ports south of New York, partly because it was only in July that it was deepened to 18 ft. and partly because there is not any considerable saving in distance for boats from Philadelphia and the Chesapeake.

The Eastern Steamship Corporation for a time sent through some of its New York freight steamers, boats of the "H. F. Dimock" and "Herman Winter" type, about 272 ft. long and of 2,700 gross tons. Also, the steamer "Lansing," of 1,600 tons' gross registry, but now usually carrying less than 700 tons of coal, has been using the canal regularly. Aside, however, from the two lines of coal-carrying barges mentioned later, the bulk of the traffic thus far has been in the smaller-sized sailing vessels.

The canal is now dredged to 20 ft.; it is 100 ft. wide at the bottom and 200 ft. wide at the top, the Buzzards Bay entrance having a width of 300 ft. There is perhaps no prejudice quite so strong as that of the average mariner, and the fact that the approaches are waters unknown to most of the vessel masters, especially those in boats drawing 15 ft. or more, is something it will take time to overcome. In other words, the canal will have to show a marked saving in time to induce owners to order their boats through and pay the 5½c. per cargo ton loaded and 4c. per cargo ton light, these being the present rates. The saving of distance is not great enough to make the canal route the obvious one under present conditions.

Among some of the shipping people there is a feeling that a favorable use of this route is dependent on tide, and that passage is often so delayed through adverse currents that the vessel might as well take its chance of rounding the Cape. Then, too, there is an opinion that vessels leaving the canal breakwater in Cape Cod Bay and later being caught by northeasterly winds have no harbor to run to and are too far inshore to be handled easily.

Sample opinions were expressed in the hearing given on Oct. 19 in Boston by Colonel Millis, of the United States Engineer Corps, on the proposal for a lane to be kept open through Vineyard and Nantucket Sounds. A representative of the Merchants and Miners Transportation Co., operating steamers between Boston, Norfolk and Baltimore, said that in fair weather his line did not care to use the canal and that in foggy weather it was hard to find it. Other captains and pilots said they saw no chance for the larger steamers and vessels using the canal to any extent until it was widened to 400 or 500 ft. and dredged still deeper than it is now.

There are some, however, who believe that even if the larger vessels do not go through, the number of towed barges will steadily increase and the outside route will be made that much less dangerous. Tugs and barges of the Lehigh Valley Transportation Co. tried the canal during the summer, but they have not as yet made it a practice. The fleet of the Pennsylvania Coal Co., freighting anthracite from the Erie and the New York, Susquehanna & Western, have used the canal quite consistently in recent months, but the number of boats is not large. If the Philadelphia & Reading Transportation Line, with its 12 tugs and 70-odd barges, should approve the new waterway, it would set the enterprise forward to a measurable extent.

The canal therefore is still in a development stage, and it cannot be said to have had any marked effect on the coastwise coal trade.

Work Wanted by Texas Miners

A reader of *Coal Age* states that down in Texas a large number of men are out of employment and are desirous of securing work in the coal mines of some other field. Anyone wishing to communicate with these miners should let us know.

Coal Age will be pleased to act as a clearing-house for men who wish employment or for mine owners who are short of labor. Tell us your wants.

The Union Yet to Be

The operator's trials with the union are largely due to a few unreasonable persons and some day to offset the work of these the operator will help to post notices on the buildings announcing union meetings. He may add an admonition of his own asking his men to go and vote their preferences. He will then try to make the union a reflection of the popular will and not the work of a clique, the scheme of unscrupulous plotters. Incidentally, too, it may be added, he will do less plotting himself and harmony will replace the present unfriendliness.

Sociological Department

First Aid or Prevention

First aid seems like an old familiar friend and needs no introduction. A friend indeed it has been to many a man who has traveled the rough road to the hospital. When we stop to think of the things which have been done by the Government, by the Red Cross and by industrial corporations, we realize how important it must be. Many lives have been saved by resuscitation methods alone, and many otherwise serious injuries have been rendered trivial by prompt attention. But with all its sterling qualities first aid is at best only a part of the pound of cure and must be so considered. We have pensions for the aged, burial benefits for the dead, insurance for the sick, first aid for the injured, but none of these things can be termed "prevention."—*H. S. Salmon.*

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Indiana State First-Aid Meet

The rules of the Indiana State First-Aid Meet at Bicknell, Oct. 30, represent extended experience in the management of intercompany and open meets and contain much material which might well be copied elsewhere. Information regarding such rules is often requested, and for that reason they are printed here.

1. A team shall consist of a captain, four assistants and a patient. Teams may bring their own patients or upon request one will be furnished by the judges.

2. The captain may designate the member or members of the team by whom the event is to be performed.

3. The captain will control his team in its field work and stretcher drill, but only when the full team is engaged. The captain or other members must not prompt a person or persons performing the event unless he or they are participating in that particular event. In team events the captain may take actual part in the contest himself or merely direct the team.

4. The captain may take an actual part in bandaging in all events.

5. At the conclusion of any event the captain must raise his right hand and announce his team number. The team will remain at its post until relieved by the judge.

6. Teams must furnish all their own first-aid material, including bandages, splints, blankets, etc., and shall not be allowed to leave the patient in order to obtain material.

7. The triangular bandage shall be regarded as the standard in the contest, but roller bandages may be used, and equal credit will be given for their proper handling.

8. All splints must be prepared on the field during each event requiring their use.

9. No practicing will be allowed on the field before the beginning of the contest.

RULES BY WHICH JUDGES WERE GUIDED

10. The teams will be numbered consecutively, beginning at No. 1, and they must occupy the positions assigned to them on the field.

11. Judges will perform their work progressively. If there is a sufficient number of judges, judge No. 1 will judge team No. 1 in event No. 1; judge No. 1 will judge team No. 2 in event No. 2, etc. Where it is necessary to have each judge scrutinize two or more teams at a time, the same procedure will be followed as far as practicable. Judges will thus progress in each event to the team or teams of the next higher numerical designation, returning to the first team or teams when they have judged all the others. The judges will be selected by the committee on judging. The judge's decision regarding the time allowed for events and for removal of dressings should be communicated to team captains by the officials of the meet before the contest begins.

12. Each judge will be required to scrutinize the work done in each event and may call upon the captain or member who applied the dressing to explain his treatment.

13. An event embraces a problem which may call for the treatment of one or more injuries and the handling of the patient.

14. The events for the contest will not be announced until the teams are on the field and in their positions, each event being announced just prior to its performance.

15. Each judge will mark the team number, event and discounts for each team, sign his name and deliver the report to the chief judge after each event, who in turn will deliver these reports to the recorders to be checked. Suitable record cards for the use of the judges will be printed in advance and turned over to the chairman of the judges the day before the contest.

16. The recorders will add the discounts and mark the points made by each team in each event. The total points will be divided by the number of events, and the quotient will be the average for each team for the whole contest.

17. The points made in events performed to decide a tie shall not be included in the total points made in the whole contest.

18. Teams which make the highest average and tie score in events for which honors or prizes are offered shall precede all other teams having a lower score in the original events.

SCENE AT THE RECENT BICKNELL MEET

19. All ties shall be decided by special events.

20. Teams will not be discounted for slow work unless they exceed the alloted time or fail to give treatment promptly. All events will commence and be finished at the sounding of a gong or other audible signal, the meaning of which should be communicated to all team captains before the events commence.

21. Any standard style of stretcher may be used except where the event calls for an improvised litter.

22. The prizes will be listed by the committee on awards.

23. Donors of prizes will be required to advise the committee on awards of the manner in which their prizes shall be awarded, based upon these rules.

24. The judges have been instructed to discount a team 18 points for applying a dressing to the wrong limb or the wrong side of the body. The points will be made up as follows: Lack of attention, 2 points; not locating injury, 4 points; improper treatment, 12 points.

25. In events requiring artificial respiration a judge may require a team to perform the action separately if he is judging more than one team.

26. All splints and paddings used in the contest must be prepared during the event in which they are to be used.

27. Preceding all events it shall be the duty of the captain of each team to see that all triangular bandages are unfolded, as no folded triangulars will be permitted unless they have been folded during the event for which they are to be used.

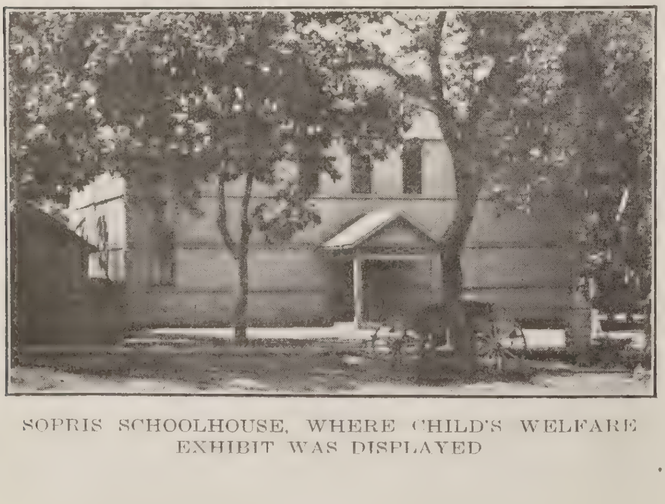
Public School Conference at Trinidad, Colo.*

The Public School Conference at Trinidad, Colo., was the outgrowth of a gathering at Sopris in the same state last April, at which a small group discussed matters pertaining to the public-school and related activities in Sopris and adjacent Colorado Fuel and Iron Co. camps.

It was decided at that time to arrange for a larger conference at Trinidad and to invite the coöperation of all interested in the public schools of Las Animas and Huerfano Counties. Much of the success of the conference was due to the presence and hearty support of Mrs. Mary C. C. Bradford, state superintendent of public instruction, and the county superintendents of these two counties. The work also of W. E. Bragg, representing the Colorado Fuel and Iron Co., was untiring and effective.

JOHN D. ROCKEFELLER, JR., AND MISS EDNA CAMPBELL'S SCHOLARS AT BERWIND

The registered attendance, not including many occasional visitors, was as follows: Teachers and directors from schools in Colorado Fuel and Iron camps (this includes every teacher in the schools in these camps), 61; from other schools in Las Animas and Huerfano Counties, 154; public-school officials and visitors, 21; total, 236.



SOPRIS SCHOOLHOUSE, WHERE CHILD'S WELFARE EXHIBIT WAS DISPLAYED

Among the prominent visitors and speakers from outside these counties, in addition to Mrs. Bradford, who aided the conference either by their presence or by also participating in the program, were: Mrs. J. F. Welborn and Mrs. J. A. Writer, of Denver; Mrs. W. C. Borst, of the Denver public schools; Miss Mary L. Oberlin, of the State Agricultural College; Dr. L. D. Osborn, of the University of Colorado; Prof. J. F. Keating, of Pueblo, and Prof. E. D. Randolph, of the State Teachers College.

On Thursday evening preceding the conference the visitors and speakers were the special guests of the Lincoln School of Sopris at a delightful dinner prepared and served by the domestic science pupils in the cottage recently erected by the company for the use of this department of the school.

On Friday evening the delegates were the guests of the company at a dinner served in the Trinidad Presbyterian Church.

Mrs. Bradford, state superintendent, in speaking of the camp schools and of this conference, says:

> The most remarkable educational work of its kind in Colorado is being carried on in the camp schools of Las Animas and Huerfano counties. The teaching force seems thoroughly alive to the most advanced present-day educational demands and is doing practical work which will fit the pupils for the duties of life and teach them good citizenship—a majority of them being children of foreign parents.
>
> Beginning with the tiny pupils in kindergarten, first-aid is taught through all the grades of the schools.
>
> The conference was not only the largest and most educational ever held in southern Colorado, but was unusual of its kind.
>
> At the Sopris camp a remarkable little community house has been erected by the Colorado Fuel and Iron Co. and rented to the public schools, and there is evident a strong desire on the part of the company to better the living conditions of all classes of employees.

A LINE-UP OF THE EDUCATORS AT THE TRINIDAD SCHOOL CONFERENCE

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Quit Your Grumblin'

Quit your kickin', old man—it's not any use
To fight Mr. Trouble with jawbone abuse.
If you want to succeed, it's not any way
To go around kickin' and wastin' your day.
If you can't make the hill a-runnin' on high,
Just throw her in low, and never say die.
The first in the start may finish the last,
So keep on a pluggin'; don't hurry too fast.
Keep smilin'; don't worry; you'll make it all right
If you just keep a-tryin' with all of your might.
Don't waste your time kickin', but throw off your coat
And dig in and root like an Arkansaw shote.
If you think with old Fortune you have a rare pull,
You're kiddin' yourself with a poor line of bull.
If you want to make good, you'll have to go through
With a stiff course of trainin' before you will do.
So cut out your kickin' and turn off the bile
And jump in and work, with a song and a smile.

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The United Mine Workers Will Hold at Des Moines, Iowa, a first-aid meet from all parts of subdistrict No. 3, District 13. J. J. Forbes, representative of the United States Bureau of Mines, is supporting the movement. The meeting will be held in the Des Moines Coliseum, and 40 teams of six men each will compete, some of whom have been active in first-aid work for four years. Several labor leaders will probably attend.

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*From the Colorado Fuel and Iron Co. Industrial Bulletin, October, 1915.

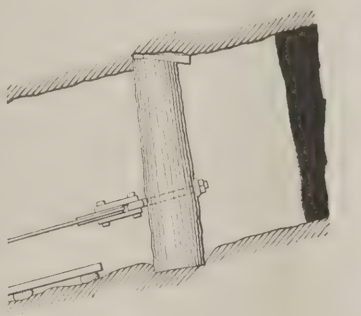
Discussion by Readers

Handling Cars on Pitches

Letter No. 2—Replying to Mine Superintendent's request for a practical method of handling cars in rooms where the grade is too steep to enable them to be safely handled by hand, permit me to say that the method as described in *Coal Age,* Oct. 23, p. 687, in answer to this inquiry, can be worked successfully. I may say that there is no such thing as failure in this system if the grade is sufficient to overcome the friction of the moving cars. My experience of 20 years in the operation of such inclines enables me to say that where economy is a chief factor this system meets every requirement.

As has been suggested it is always possible to lessen the grade by driving the rooms across the pitch or at an angle with the level. This also widens the range of application of the different methods of handling cars in pitching seams.

The double-track, self-acting incline, owing to its simplicity, is a great convenience to miners when working on pitches where it can be used. The system is well understood and needs little explanation further than that already given. Every miner knows how to set an 8-in. or 10-in. post at the head of an incline so as to hold the load. There are, however, different methods of attaching the sheave wheel to the post. I have been accustomed to use a long bolt that is passed through a hole bored in the post about a foot above the level of the rails, as shown in the accompanying sketch. The end of the bolt is threaded for a nut, and a heavy washer is used under the nut so as to give a better bearing against the back of the post.



SHOWING POST SET AT HEAD OF ROAD TO HOLD SHEAVE

A chain is often used in preference to the wire rope, for the reason that the strands of the rope are apt to be broken by passing over a small sheave. Besides, if the chain is broken, it is more easily and quickly repaired than a rope, which must be spliced—an operation not always understood by miners.

The double-track system has one disadvantage. It necessitates keeping a larger number of cars in use, since there must always be one empty car and one loaded car in each room. To overcome this difficulty, a small heavy iron truck called a "barney" is sometimes employed. This consists of an iron casting 3 in. thick and about 3½ ft. long mounted on small wheels. This barney takes the place of an empty car when lowering the loaded car from the face of the room to the entry. The barney may be operated on another track at the side of the loaded track, but it is sometimes made to run on light rails laid between those of the main track. In this arrangement the barney passes under the cars as they descend or ascend the incline. The weight of the barney must be such that it will partly counterbalance the weight of the loaded car and at the same time be sufficiently heavy to pull the empty car up the incline. The weight of the barney is regulated by extra iron plates that can be laid on top of the iron base, to which they are secured by bolts.

Another modification of this system that I have seen employed with success uses but a single track. In this case, the loaded car is well spragged so as to control its descent on the incline. When the two cars have come nearly together, the loaded car descending and the empty car ascending the incline, they are stopped. A timber is thrown across the track so as to hold the loaded car. The empty car is then turned up at the side of the track and the loaded car carefully lowered past it, when the empty is replaced on the track above the loaded car. The rope is now again coupled to the cars, after which the load is lowered to the entry.

I have seen all of these methods employed under varying conditions, and will say that Mine Superintendent need have no hesitancy in adopting one of them. The convenience of the system will quickly repay the slight expense of its installation. There should always be some attachment provided at the foot of the incline to hold the rope or chain when this is unhooked from the loaded car.

THOS. MULHOLLAND.

Ensley, Ala.

The Effect of Storage on the Analysis of Coal

In further discussion of the question, asked by R. T. M., *Coal Age,* Aug. 14, p. 271, I beg to add a few words to the explanation offered by Percy N. Coupland.

Mr. Coupland, in answering this question, writes that "the extent of deterioration in the coal would be determined by the percentage of loss in heat value." It is fully agreed that a calorific determination made on coal when first put in storage and again when removed from storage would show the loss in heat value for that period, but it is hardly correct to assume that this one and only determination would show the total loss and impairment sustained by storage.

When deterioration takes place in coal, it not only affects the chemical constituents but likewise the physical and coking qualities of the coal. In order to accurately determine the extent of deterioration an ultimate organic analysis must be made, by which is determined the percentage content of hydrogen, carbon, nitrogen and oxygen by difference. To ascertain the loss of byproducts and impairment of coking qualities, diminutive laboratory carbonization tests are required. Some coals that are easily susceptible to oxidation in storage show noticeable changes in the composition of the volatile matter even in six months' time, as for instance, a loss of ammonia and tar and a fluctuation in the percentages of carbon dioxide and hydrogen sulphide.

The composition of the gas evolved from weathered coal has been shown to differ from that of fresh coal in that there is an increase in the percentages of hydrogen and carbon monoxide and a decrease in the percentages of methane and illuminants, which give a resulting gas of lower B.t.u. value per cubic foot of gas.

To certify to the extent of deterioration of coal during storage, in the full sense of the word, involves more work than the singular determination of calorific value. While it is the general opinion that it is not necessary to conduct elaborate tests as mentioned for the ordinary consumer of coal, yet the results of such tests are essential and prove of operating importance where weathered coal is coked in the modern byproduct coke ovens and where its every quality and constituent has a definite value and purpose.

Joliet, Ill. BYKEM.

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Responsibility of Miners

Letter No. 3—Referring to the letter of C. W. Rotenberry, *Coal Age*, Sept. 18, p. 472, I note that he mentions briefly the rapid growth of the safety-first movement and the great favor that it has met among mine officials and operators in recent years, resulting in the reduction of accidents and the saving of many lives. The writer of the letter censures the newspaper press for the attitude it has assumed, claiming that it educates the miner to believe that "companies are directly and wholly responsible for the safety of their employees in the mine."

INCREASED SAFETY IN MINES TODAY

Mr. Rotenberry then refers to the "great advance" that mine officials have made in the direction of safety. It is true that mine officials as a class have made rapid advancement in many things pertaining to safety in mining during recent years. Two principal reasons can be assigned for this result:

First, the requirement of many state mining laws that mine foremen must hold certificates of competency before being permitted to assume the duties and responsibilities of such a position is being better enforced now than formerly. In many instances the applicants for these certificates are obliged to pass rigid examinations on practical questions pertaining to safety in the operation of mines, and the standard of these examinations has been gradually raised so as to attain a higher degree of efficiency among successful candidates.

Second, operators today are seeking mine officials who are proficient in safety measures and can intelligently instruct their men in what is required. In order to enforce safety measures, a mine official must practice them himself. Mine foremen are coming to realize that this is one of the chief requirements of their position.

FORMER PRACTICE IN TESTING FOR GAS

As an illustration I shall cite an incident in my own experience. A little more than 30 years ago I was digging coal in a place where no gas had been found previously. When I went into my room one morning, the open light I carried ignited some gas that had accumulated the night before at the face of the room. Although I was not seriously burned, the flame having passed over my head, I went out of the mine and did not work that day. On returning to work the next morning, the boss told me to lower the flame of my light on going into the room and to raise it carefully toward the roof to see whether there was any gas there. Not knowing any better, I followed his instructions, but fortunately for me no gas had accumulated that morning. What would be said of a mine foreman giving such instructions to a miner today?

REQUIREMENTS RELATING TO MINERS

Again, speaking of safety Mr. Rotenberry says, "Miners, as a class, have retrograded along this line." While miners may not have advanced as rapidly as mine officials in respect to safety, I do not think they have retrograded. The responsibility for their slow progress in this direction rests with the mining laws, which do not require a fixed standard of competency on the part of the miner. At least this is the case in the majority of coal-mining states. In former years a miner was required to serve as helper for several months, working with an experienced miner before he was permitted to mine coal alone. With few exceptions, there is no such requirement of miners today, but men fresh from the farm and the factory, without any training or previous experience in mining, are permitted to enter the mine and dig coal. It is clear that these men are unable to protect themselves properly while at work in the mines.

I have observed a growing tendency in some mining sections to relieve miners of any personal responsibility for their own safety, supplementing the responsibility of the miner by the efficiency of the foreman and other safety officials. This is too great a responsibility to be shouldered by the foreman. The personal responsibility of the miner cannot be shifted to the shoulders of a foreman, however efficient the latter may be. When a miner realizes his own responsibility, he becomes more prudent and careful in his work.

I do not know that miners are more reckless and careless than other workmen, as is often charged, but it is a fact that many miners assume unnecessary risks. No doubt many accidents result from this cause, while the responsibility for their occurrence is charged to the inefficiency of the foreman. It must be admitted that miners, for the most part, possess the necessary knowledge of what is required to safeguard themselves, but they are prone to wait for the mine foreman or another mine official to instruct them before taking the precautions they know to be necessary.

SHORT HOURS TEND TO CARELESSNESS

I believe it was Savonarola who said, "One only knows what he practices." A knowledge of any calling is of little or no value if not practiced or judiciously employed as occasion may require. For instance, an experienced miner who carelessly works under a loose piece of slate is as likely to be killed as the laborer who has no knowledge of the impending danger. Therefore it is not so much what a man knows as what he practices.

I agree with the suggestion that the shortening of the hours in which a miner must perform his work has a tendency to make him careless. It may be added that a reduction in the price paid for mining has the same tendency, as the miner must load more coal in less time in order to make the same amount of money as formerly. As a consequence, he neglects setting the necessary timber to protect himself while at work.

JOHN ROSE,

Dayton, Tenn. Former District Mine Inspector.

Store Checks vs. Thrift

Letter No. 7—I have been reading the letters published in *Coal Age* on the subject of "Store Checks vs. Thrift," and in one instance only (Letter No. 4, page 863) has it been plainly shown that thrift is a characteristic virtue inherent in the individual and one that should not be influenced either favorably or unfavorably by the accident of environment.

An individual who has developed this virtue with respect to financial matters has learned several important lessons in economy. He has acquired a certain amount of control over indiscreet tendencies and trained his mental faculties in the most important of their operations—thought. He has learned that his wages are an interest or dividend paid on his invested capital; that labor is the only way by which his present strength and skill can be converted into a tangible means of support in later years when his earning capacities are on the decline and become less remunerative. He has acquired the power to deny the gratification of his selfish desires and trained his thoughts and directed his energies to securing the material welfare of himself and those dependent upon him.

It is to be regretted that this virtue is not characteristic of the coal miner. It may seem harsh to say that a large percentage of coal miners are naturally selfish. As a class they are commonly considered to be large-hearted, sympathetic and generous, and they certainly do possess these qualities in a large degree. But it is the free exercise of these attributes without due thought of the future that is productive of selfishness. When a man spends his wages without proper regard to the material welfare of his family, he is gratifying a selfish wish or desire, whether it be participated in by the whole household or not.

A Thrifty Man May Always Be in Debt

The exercise of thrift does not necessarily result in the accumulation of wealth, neither is the thrifty man always free from debt. Circumstances may be such that the earnings may not be adequate to meet the necessary expenditures; but any saving is always the evidence of thrift if it accomplishes no more than the reduction of a debt. It has been candidly admitted by employers that efficiency is the best recommendation of an employee and that a thrifty man is generally an efficient workman. It seems a natural conclusion, therefore, that it would be good policy on the part of all employers, especially those in the coal-mining industry, to afford their employees every possible advantage for the exercise of this virtue.

The abolishment of the store-check system or any other form of commercial transaction relating to the commissariat of a mining camp will not tend to develop the quality of thrift among the miners. On the other hand, the manner in which such stores are conducted may make a thrifty miner dissatisfied and result in his seeking another field where he will have an opportunity of saving a portion of his wages by the exercise of thrift, even though his earnings may be less.

A Scheme to Outwit the Company

The manner in which company stores are often conducted affords many opportunities for the display of thriftlessness. The man who is constantly in debt at the store cannot always be regarded as a thriftless man, however. I have known instances in which the policy of keeping in debt at the store was pursued not merely as a scheme to secure steady employment, but as a means of banking savings. The scheme works as follows: A married man boards, as members of his own family and not as boarders, from four to eight employees of the mine where he works. He is generally a steady worker, but it requires more than his earnings to meet the monthly or semi-monthly store bills, and each succeeding month adds to his indebtedness at the store. Now, to help this good customer out, the store manager applies to the mine management and the delinquent is given steady work in the most remunerative place in the mine.

In the meantime, this man collects the board of his lodgers and banks it, making no effort to discharge his indebtedness at the store. Let me ask, Who is the goat in this case? Is it not a true business maxim that the man who meets his indebtedness promptly pays for the deficiency caused by the man who does not? Then, the thrifty, honest man must not only bear the burden of the business profits, but the losses as well. The instance I have cited will no doubt be pronounced by store managers and others as dishonest, and so it is. But is it any more dishonest than for the manager to make up his losses by increasing the prices of the goods he sells? Commissariat stores doing business on such a principle are not a menace to thrift, but are cultivators of dishonesty.

Discounting Store Checks

I have never had experience in camps where the discounting of store checks and their subsequent redemption in legal currency has been practiced, but it appears to me that any management that would tolerate such methods would be guilty not only of degrading the habits of the miners, but affording means for sharp practices on the part of speculators.

I have had experience, however, in camps where store checks were used only in exchange for goods at the commissariat, and this certainly cannot be regarded as an indication of a lack of thrift, but on the contrary it is an exhibition of good business sense. Even supposing I can discount a $10 store check at 20 per cent. and invest the $8 in cash at a store where I can secure a value in the necessaries of life equal to what I could purchase at the commissariat for $11 in script, I am then saving $1 in cash. Instances of this kind can be substantiated. They are good examples of thrift and business policy. The loser in this case is the man who discounts the check, for it is redeemable only at the commissariat at the prevailing prices.

The prevalence of high prices and dilatory if not discourteous service are not the only features that are objectionable at company stores. There is often a compulsive feature that is even more objectionable than those mentioned. A miner is not told outright, in so many words, that the continuance of his job will depend on his dealing exclusively at the store, but this is intimated in terms that even the dullest intellect can comprehend. Nothing detracts so much from a man's self-esteem and his natural manhood as to know that his actions are controlled by compulsory methods. Circumstances may compel him to submit, but it will be under protest, and he will seize the first opportunity to "get even."

If commissaries were conducted along the lines suggested in Letter No. 4, the quality of thrift would not be developed, but it would have a broader field and a freer scope for its exercise, to the financial betterment of all parties, while improvidence and recklessness would be restrained and curtailed. A. M. Iner.

——, Penn.

* * *

A Flooded Mine Proposition

Letter No. 3—Referring to the inquiry, *Coal Age*, Oct. 16, p. 646, on this subject and the suggestion following Letter No. 2, on the same subject, page 854 of the issue of Nov. 20, in regard to keeping boreholes a considerable distance in advance of the working faces, I desire to submit a rule adopted by the Tennessee Coal, Iron and Railroad Co. to prevent such occurrences, which is as follows: "When it is known that a place is likely to obtain a dangerous accumulation of gas or water, workings approaching such places shall not exceed 8 ft. in width, and the person or persons driving such places shall constantly keep at a sufficient distance ahead, not less than 20 ft. in advance, one borehole near the center of the working and one at each corner 20 ft. deep, at an angle of 45 deg., at intervals of 6 ft. These holes shall not be used for blasting, but separate holes for blasting, not over 4 ft. deep, must be drilled. These precautions must begin at least 100 ft. from the probable source of danger."

The reason for beginning these precautions so far from the probable source of danger is to allow for possible error in old surveys which cannot be checked or for the possibility of old maps not showing the final extraction of coal from the abandoned area. When the accuracy of the surveys and maps is assured, this distance can be lessened, but safety of operation must always be the first consideration.

In order to control the flow through one of these boreholes in case water or gas under pressure is encountered, the near end of the hole can be kept reamed out and a piece of pipe with a gate valve inserted and packed and braced so that the pressure cannot force it out when the valve is closed, and so as to prevent leakage around it, the pipe and valve being of sufficient size to allow the drill to easily pass inside of it. For instance, if a 1½-in. drill is used, after each shot is taken, the near end of the hole can be reamed out to make a tight fit for a 2-in. pipe, which can be inserted with a gate valve of the same size and the hole extended by drilling through the valve and pipe.

If desired, the water can be drained from the flooded workings through this valve, as it can be handled. When the water is tapped, a larger hole and pipe or several of them can be used if it is desired to drain the flooded workings more rapidly. Edw. H. Coxe.

Knoxville, Tenn.

* * *

Study Course in Coal Mining

By J. T. Beard

The Coal Age Pocket Book

LINEAR (U. S. TO METRIC)

	Millimeters	Centimeters	Meters	Kilometers
1 inch =	25.400	2.540	0.0254	
1 foot =	304.800	30.480	0.3048	
1 yard =		91.440	0.914	
1 rod =			5.029	0.005
1 furlong =			201.168	0.201
1 mile =			1609.347	1.609

SQUARE (METRIC TO U. S.)

	Sq.In.	Sq.Ft.	Sq. Rods	Acres	Sq.Mi.
1 sq. millimeter =	0.0015				
1 sq. centimeter =	0.155				
1 sq. decimeter =	15.500	0.108			
1 sq. meter (centare) =		10.764	0.040		
1 sq. decameter (are) =		1076.387	3.954	0.025	
1 sq. hectometer (hectare) =			395.367	2.471	
1 sq. kilometer =				247.104	0.386
1 sq. myriameter =					38.61

SQUARE (U. S. TO METRIC)

	Sq.Mm.	Sq.Cm.	Centares	Ares	Hectares
1 sq. inch =	645.16	6.45			
1 sq. foot =		929.03	0.093		
1 sq. yard =			0.836		
1 sq. rod =			25.293	0.253	
1 acre =				40.469	0.405
1 sq. mile =					259.

CUBIC (METRIC TO U. S.)

	Cu. Inches	Cu. Feet	Cu. Yards
1 cu. millimeter =	0.00006		
1 cu. centimeter =	0.06102		
1 cu. decimeter =	61.0235	0.0353	0.0013
1 cu. meter =		35.3145	1.308

CUBIC (U. S. TO METRIC)

	Cu.Mm.	Cu.Cm.	Cu.Dm.	Cu.M.
1 cu. inch =	16,387	16.387	0.164	
1 cu. foot =		28,316.84	28.317	0.028
1 cu. yard =			764.555	0.765

CAPACITY (METRIC TO U. S., LIQUID)

	Gills	Pints	Quarts	Gallons	Barrels	Hhd.
1 milliliter =	0.008					
1 centiliter =	0.085	0.021				
1 deciliter =	0.845	0.211	0.106			
1 liter =	8.453	2.113	1.057	0.264		
1 decaliter =			10.567	2.642	0.084	
1 hectoliter =				26.417	0.839	0.419
1 kiloliter =				264.170	8.386	4.193
1 myrialiter =					83.864	41.932

One myrialiter contains 10.48295 tuns.

The Coal Age Pocket Book

CAPACITY (METRIC TO U. S., DRY)

	Pints	Quarts	Gallons	Pecks	Bushels
1 centiliter =	0.018				
1 deciliter =	0.182	0.091			
1 liter =	1.816	0.908	0.227	0.114	0.028
1 centistere =		9.081	2.270	1.135	0.284,
1 decistere =			22.702	11.351	2.838
1 stere =					28.378
1 decastere =					283.777

The decastere is equal to 7.88269 chaldrons.

CAPACITY (U. S. TO METRIC)

(Liquid)	Ml.	Cl.	Dl.	L.	Kl.
1 gill =	118.29	11.829	1.183	0.118	
1 pint =		47.318	4.732	0.473	
1 quart =			9.464	0.946	
1 gallon =			37.854	3.785	
1 barrel =				119.241	0.119
1 hogshead =				238.482	0.238
1 pipe =				476.965	0.477
1 tun =				953.929	0.954
(Dry)					
1 pint =	550.61	55.061	5.506	0.551	
1 quart =		110.122	11.012	1.101	
1 gallon =			44.049	4.405	
1 peck =			88.097	8.810	
1 bushel =				35.239	0.035
1 chaldron =					1.269

CAPACITY (METRIC TO BRITISH)

(Wet and Dry)	Gills	Pints	Quarts	Gallons	Pecks	Bushels
1 milliliter =	0.007					
1 centiliter =	0.070	0.018				
1 deciliter =	0.704	0.176	0.088	0.022		
1 liter =	7.043	1.761	0.880	0.220	0.110	0.028
1 decaliter =			8.803	2.201	1.100	0.275
1 hectoliter =				22.008	11.004	2.751
1 kiloliter =				220.083	110.042	27.510
1 myrialiter =						275.101

CAPACITY (BRITISH TO METRIC)

(Wet and Dry)	Ml.	Cl.	Dl.	L.	Kl.
1 gill =	142.0	14.199	1.420	0.142	
1 pint =		56.797	5.680	0.568	
1 quart =			11.359	1.136	
1 gallon =			45.437	4.544	
1 peck =			90.875	9.087	
1 bushel =				36.350	0.036

The conversion factors in these tables have been derived independently from the following standards:

1 meter (U. S.) = 39.37 in. (1 in. = 25.4 mm.);
1 sq. meter = $39.37^2 \div 144$ = 10.76386736 sq.ft.;
1 cu. meter = $39.37^3 \div 1728$ = 35.31445447 cu.ft.;
1 liter = 61.02338189 cu.in.;
1 U. S. (Winchester) bushel = 2150.4 cu.in.;
1 British (imperial) bushel = 2218.192 cu.in.

Inquiries of General Interest

Flow of Water in Pipe Line

Referring to the inquiry, *Coal Age*, Nov. 6, p. 773, I want to draw attention to an evident error in the answer given to the question asked, in respect to the change of head or pressure owing to the gradual contraction and enlargement again of the sectional area of the pipe. The answer gives the pressure at the contracted area as 256 times the pressure in the main pipe, which is evidently at variance with the well-known principle of hydraulics that should apply in this case where pressure head is converted into velocity head.

My figures show that, ignoring friction, there is a loss of 99.1 ft. in pressure head, owing to the contraction in the sectional area of the pipe and consequent increase in the velocity of the water. I estimate that this will be the difference in head up to the point where a vacuum occurs at the throat, when the carrying capacity of the pipe will begin to be reduced. In other words, the pipe will run full, in the case assumed, under any head not less than 99.1 ft. minus the head corresponding to the atmospheric pressure, which at sea level is practically 34 ft. This would make the limiting head in the main pipe, for full capacity, 99.1 — 34 = say 65 ft., and any less pressure would not maintain the full capacity of this pipe. I would like to see this question treated again in full.

T. R. HAYTON.

Appleton, Wis.

We thank correspondent for drawing attention to this oversight, which is quite apparent in the last paragraph of the previous answer in respect to the change of pressure head due to the contraction of the area of the pipe. In this case, owing to the gradual contraction and enlargement of the sectional area of the pipe, ignoring friction, the pressure head is converted into velocity head as the area reduces and is again changed into pressure head as the area enlarges.

The first step is to estimate the change in velocity due to the change in sectional area. For the same flow of water, the velocity varies inversely as the sectional area of the pipe. In other words, the velocity ratio is equal to the inverse area ratio, or the square of the inverse diameter ratio. Calling the original velocity and diameter v_1 and d_1 and the velocity and diameter at the throat v_2 and d_2 respectively, we have

$$\frac{v_2}{v_1} = \left(\frac{d_1}{d_2}\right)^2$$

Then, substituting the given values in this formula, the velocity at the throat is

$$v_2 = 5\left(\tfrac{12}{3}\right)^2 = 5 \times 4^2 = 80 \textit{ ft. per sec.}$$

The old Bernouilli theory, relating to the flow of fluids in conduits, makes the sum of the pressure head, velocity head and gravity head a constant throughout the length of the pipe line. The pipe line in this case being horizontal, the gravity head is zero and the sum of the pressure head and velocity head is constant at any point in the pipe. Hence, calling the pressure in the main pipe h_1 and that at the throat h_2, we have

$$h_1 + \frac{v_1^2}{2g} = h_2 + \frac{v_2^2}{2g}$$

and

$$h_1 - h_2 = \frac{1}{2g}(v_2^2 - v_1^2) = \frac{80^2 - 5^2}{64.32} = 99.1 \textit{ ft.}$$

This shows, as our correspondent has stated, that the loss in pressure head due to the contraction of the area is 99.1 ft., under the assumed conditions. Also, it is clear that this loss in pressure head holds true for these velocities, irrespective of the head in the main pipe, which can be reduced to 99.1 — 14.7 ÷ 0.434 = 65.3 ft., at sea level, before a vacuum will form at the throat and reduce the capacity of the pipe.

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Problem in Mathematics

Will you kindly show the correct solution of the following problem: An army of soldiers in single file is 50 mi. long. Assuming that the soldiers, marching continuously, go 50 mi. in 10 hr., if an officer starts at the same time from the rear of the column and walks the entire length of the line to its head and then turns and walks back and reaches the rear of the column in the same time that the soldiers complete their march of 50 mi., how far has the officer walked in the 10 hr.? I am told that the correct answer to this example is 120.6 mi.

Roanoke, Ill. PAUL CERAR.

Assume the officer walks at the rate of x mi. per hr. The soldiers march at the rate of 50 ÷ 10 = 5 mi. per hr. Therefore, the officer gains on the soldiers $(x - 5)$ mi. per hr., and he will gain the length of the column, or 50 mi., in as many hours as $x - 5$ is contained in 50.

When walking back toward the rear of the column, while the officer is walking x mi. toward a soldier, that soldier is walking 5 mi. toward the officer, which makes the total ground covered, or the distance the officer has approached the rear of the column, as measured along the column, $(x + 5)$ mi. in 1 hr. At this rate the time, in hours, required for the officer to reach the rear of the column and complete his task will be found by dividing the length of the column (50 mi.) by $x + 5$, the gain per hour. This must then be added to the time the officer took to reach the head of the column.

Since the total time of marching is 10 hr., we write the equation

$$\frac{50}{x - 5} + \frac{50}{x + 5} = 10$$

$$5(x + 5) + 5(x - 5) = (x + 5)(x - 5)$$

$$x^2 - 10x = 25$$

$$x = 12.07 \textit{ mi. per hr.}$$

The distance the officer has walked in 10 hr. is therefore 10 × 12.07 = 120.7 mi.

Examination Questions

Miscellaneous Questions

(Answered by Request)

Ques.—(a) What are permissible explosives? (b) What conditions make their use necessary in a mine? (c) Why are they safer than black powder?

Ans.—(a) A permissible explosive is defined by the Bureau of Mines, in its Miners' Circular No. 2, page 5, as being an explosive that "is similar in all respects to the sample that passed certain tests by the National Bureau of Mines and when used in accordance with the conditions prescribed by that bureau."

The same bulletin, page 6, explains: "An explosive named in the permissible list if kept in a moist place until it undergoes a change in character is no longer to be considered a permissible explosive. If used in a frozen or half-frozen condition, it is not when so used a permissible explosive. If used in excess of the quantity specified (1.5 lb.) it is not when so used a permissible explosive. And when the other conditions have been met, it is not a permissible explosive if fired with a detonator of less than the prescribed strength."

The Bureau of Mines also reserves the right to withdraw from the list of permissible explosives any explosive previously listed as such, which then ceases to be a permissible explosive.

(b) The presence of a dangerous quantity of gas or dust in the mine workings makes the use of permissible explosives advisable if not absolutely necessary in order to prevent accidents common to the use of black powder for blasting coal. By order of the Secretary of the Interior, the use of permissible explosives is made compulsory in the coal mines of the Indian Lands of Oklahoma.

(c) Permissible explosives are generally safer than black powder in the blasting of coal because they produce less flame in their explosion and the conditions under which they must be used, as prescribed by the Bureau of Mines, have the effect of reducing to a minimum the risks of blasting coal in gaseous and dusty mines.

Ques.—What is the capacity of a double-acting pump, when the plunger is 20 in. in diameter and has a 40-in. stroke, the pump running at 25 r.p.m.?

Ans.—The piston speed of this pump is

$$S = \tfrac{40}{12}(2 \times 25) = \tfrac{500}{3}\ \textit{ft. per min.}$$

The capacity of a pump (G), in gallons per minute, for an efficiency (E), a piston speed (S), in feet per minute and a diameter (d), in inches, is given by the formula

$$G = 0.0408\ E\ S\ d^2$$

Now, assuming an efficiency of $E = 85$ per cent. and substituting the given values in this formula, we find for the capacity of this pump

$$G = 0.0408 \times 0.85 \times \tfrac{500}{3} \times 12^2 = 2{,}312\ \textit{gal. per min.}$$

Ques.—If a fan is circulating 57,000 cu.ft. of air per minute, with the expenditure of 39 hp., what horsepower will be required to increase this circulation to 87,000 cu.ft. per min.?

Ans.—Assuming there is no change in the mine airways, the horsepower producing the circulation varies as the cube of the volume of air produced. In other words, the power ratio is equal to the cube of the quantity ratio, which gives here

$$\frac{H}{39} = \left(\frac{87{,}000}{57{,}000}\right)^3 = \left(\frac{87}{57}\right)^3 = 3.56,\ \textit{nearly}$$

$$H = 39 \times 3.56 = 138+\ \textit{hp.}$$

Ques.—A fan running at a speed of 60 r.p.m. produces a water gage of 2 in. (a) If the speed of this fan is increased to 90 r.p.m., what pressure will be produced? (b) If the quantity of air in circulation at this increased speed of the fan is 100,000 cu.ft. per min., what is the horsepower on the air?

Ans.—(a) For the same mine or airway, the quantity of air in circulation varies as the fifth root of the fourth power of the speed. In other words, the quantity ratio is equal to the fifth root of the fourth power of the speed ratio, which makes the quantity ratio in this case

$$\frac{Q_2}{Q_1} = \sqrt[5]{\left(\frac{90}{60}\right)^4} = \sqrt[5]{\left(\frac{3}{2}\right)^4} = \sqrt[5]{1.5^4} = 1.383$$

Then, since the pressure in any circulation varies as the square of the quantity of air passing, the pressure ratio is equal to the square of the quantity ratio, or in this case $1.383^2 = 1.9$, and the pressure due to the increased speed of the fan is therefore

$$p = 5.2(2 \times 1.9) = 19.8\ \textit{lb. per sq.ft.}$$

(b) The horsepower on the air is then

$$H = \frac{Qp}{33{,}000} = \frac{100{,}000 \times 19.8}{33{,}000} = 60\ \textit{hp.}$$

Ques.—In a gaseous mine where 160 persons are employed, would you consider the ventilation sufficient, providing the quantity of air in circulation is equal to 150 cu.ft. per min. per man?

Ans.—This volume of air in circulation may meet the requirements of the mining law in the state where the mine is located; but owing to certain physical conditions in the mine, such as a large opening, great thickness of seam, frequent large gas feeders or sudden emission of gas from the roof in large quantities or the presence of much fine dust of a highly inflammable coal, this volume of air may prove wholly inadequate for the safe working of the mine.

Ques.—How much oxygen will be required for the complete combustion of 100 cu.ft. of marsh gas?

Ans.—First write the chemical equation expressing the reaction that takes place when marsh gas (CH_4) is burned in oxygen (O); thus,

$$CH_4 + 2\ O_2 = CO_2 + 2\ H_2O$$

This equation shows that each molecule of marsh gas consumes two molecules of oxygen, and as these gaseous molecules are of equal size, it follows that 100 cu.ft. of marsh gas will consume 200 cu.ft. of oxygen.

Coal and Coke News

Washington D. C.

Further and decided improvement in coal-mining conditions is portrayed in the reports of the business situation sent to the Federal Reserve Board by agents of that body and published in the Federal Reserve Bulletin for Dec. 1.

From the Pennsylvania district it is reported that there is "a decided improvement in coal mining, many collieries working to capacity. Shippers, however, are confronted with a shortage of cars which is likely to check the output to some extent. Crude oil and oil refining are operating at full time, with a good demand and increasing prices. Considerable foreign business is being done. The Delaware River shipyards are busier than ever."

From Cleveland the report comes that "the coal trade shows little change over last month, except a tendency to further improvement through the activity and advance in other lines."

Richmond writes that "some coal concerns are now doing the largest business in their history. At some points there is car shortage. Mines are working at full capacity and some concerns have ceased giving out quotations on spot product. While a heavy export demand continues, the consumption for domestic purposes is greatly increased. Prospects for the future are better than fair, operators fearing only the possible handicap of shortage in labor."

From Kansas City it is stated that "the oil industry is more active than it has been at any time during the present year."

HARRISBURG, PENN.

Regulations with which the employers of Pennsylvania must comply if they desire to carry their own workmen's compensation liability insurance are being prepared by the Compensation Board.

A number of big corporations, such as coal, railroad, steel and other companies, are asking upon what terms they may secure exemption from the necessity of insuring either in the state fund or in stock insurance companies against payment of compensation, and the terms set out will permit them to carry their own insurance subject to the approval of the board. It is also required that when the board directs payments must be made to a bank or even securities deposited with the state fund so that workmen may be protected.

The data to be furnished to the Compensation Board are similar to that furnished for state taxation, and are to be held confidential. Location, kind of employment, average number of employees and estimated payroll are required with a statement of assets and liabilities, together with a statement of capital, value of patents, trademarks, good will and property, as well as a statement for three years of sales, expenses, payroll and profits. Special inquiry is made as to debt, safety, welfare and sanitation conditions, whether Department of Labor requirements are met, kinds of inspection, whether there is a safety committee and a hospital, together with data on past accident experience.

The applicant must accept the schedule of payments for compensation and must agree to deposit money required to meet compensation awards or must file money or securities or a bond equal to a year's premium. Where there is a subsidiary company the parent company may be required to give a guarantee of payment.

The board will reserve the right to make further inquiry as to financial standing at any time and to act accordingly.

Reduction in Railroad Rates Postponed

Reductions in anthracite coal rates ordered by the Interstate Commerce Commission, to become effective Dec. 1, were postponed on Nov. 23, until January 1.

This is the second postponement. The original orders were to become effective Oct. 1, but on a showing by the railroads that the new tariffs required to be filed were complicated, a first extension of 60 days was granted.

A few weeks ago coal operators in the Wyoming region asked a rehearing in relation to the proposed rates on the smaller sizes of anthracite, alleging that the new orders were unjust when the rates were compared with those of the large sizes. There have been reports that the railroads might seek to overturn the decision through court proceedings, but so far there has been no evidence before the commission of such an intent. The new rates apply between the Pennsylvania mines and the Atlantic seaboard.

The Interstate Commission on Aug. 12 gave a decision reducing railroad rates on anthracite coal from the producing districts in this state to tidewater points of 10c. a ton, and to certain points 15c.

The decision was the result of an investigation made pursuant to an order by the commission on June 10, 1912. It was the finding that rates are unreasonable, because they yield too great a profit over operating cost in the traffic.

In the case of the coal traffic of the Central R.R. of New Jersey it was found that the weighted average cost a short ton-mile was 3.3 mills, while the average revenue a ton-mile was 9.45 mills and on the long tons 10.59 mills. This comparison was held to be typical of the majority of the roads concerned.

In most cases the carriers were declared to be making over 200 per cent. on the traffic and in many cases much more. For a number of the smaller roads less favorably situated the decision, it was figured, meant a decided loss. It was estimated by experts that the total reduction of coal-road revenues would be fully $8,000,000.

PENNSYLVANIA

Anthracite

Scranton—The Carney & Brown Coal Co.'s breaker on the outskirts of the city was totally destroyed by fire at 5 o'clock on the afternoon of Nov. 26, with a loss of $50,000. The breaker had a production of 500 tons of coal per day and employed about 200 men and boys. The origin of the fire is unknown.

Shamokin—The collieries in this district have been badly handicapped by the lack of empty cars. The Philadelphia & Reading Ry. Co. is doing everything possible to deliver the equipment to the mines but despite its efforts a number of collieries have recently been compelled to close down. The railway company is also experiencing some difficulty in moving the loaded cars destined to points east and south.

Centralia—Two miners were entombed on Nov. 27, in Packer No. 5 colliery of the Lehigh Valley Coal Co. by an explosion of gas. The dead bodies of both men were found by rescuers in the gangway 1,500 yards from the scene of the explosion which did great damage and forced a suspension of all work in the colliery. The men who were working in other sections of the mine were hoisted to the surface in safety. The first level of the mine took fire for nearly 1,000 yd. Nearly all the leading mine officials and state mine inspectors of this region were on the scene with fire fighting apparatus and the company is stopping at no expense to conquer the flames.

Buck Mountain—A half century and more ago the mine of the Lehigh Valley Coal Co. here was supposed to have been worked out. However the company has relocated a coal bed and is now conducting large stripping operations and it is announced that the coal will last many years. As a result the village which was practically abandoned has taken on new life and the erection of 40 houses has been ordered by the company. The company will also spend about a million dollars in the building of a tunnel to drain the mine, work on which has already started.

Tamaqua—In preparation for the provision of the Compensation Law effective Jan. 1, 1916, the smaller anthracite companies are having insurance companies examine their mines with a view to taking over the insurance of their pay rolls. Some of the smaller companies who have but few employees and a limited income will retire from business at the close of this year.

Car shortage caused a curtailment of production during the past week, and despite the efforts of the railroads there is no apparent cause to expect better conditions for some time. The much-heralded shortage of labor in and about the mines is confined solely to laborers, aside from this class of help the usual number of applicants for mining positions can be found at the collieries. The nearby powder and munitions plants are taking some of the men but in many cases these men find conditions too burdensome, and are either discharged quickly or return to the mines voluntarily.

Hazleton—For two years the Mineral Spring colliery of the Lehigh Valley Coal Co. has been awarded the banner for having the neatest appearance around its outside workings. Five years ago when the company offered a banner to the men making the best showing this colliery stood 17th. It was ranked No. 9 the next year, following this with No. 3, until in 1913 it took first place and has held it ever since, although this year it only won by $\frac{7}{10}$ of a point. As indicative of the men's interest in the contest they have surrounded the breaker with a green lawn and flower beds and often in the summer time they are to be seen after working hours and on Sundays watering the grass and flowers.

Mt. Carmel—After years of litigation the borough of Mt. Carmel has forced an agreement with the coal companies under which the latter will provide a sewer outlet since the natural waterways have been blocked by coal dirt. It will require a considerable expenditure by the coal companies to open the proposed channel.

Bituminous

Connellsville—The Connellsville coke region is sorely in need of men to operate the coke ovens properly. The region is at present running 81 per cent. capacity and 94 per cent. efficient, that is the 31,700 active ovens capable of producing 460,000 tons of coke per week are turning out only about 433,000 tons. This condition has prevailed for some time and cannot be remedied until more men are secured.

Latrobe—The old Duquesne plant of the Bradenville Coal and Coke Co. is being made ready for firing. This plant comprises 150 ovens and has been idle for several years during which time raw coal has been shipped from the mines. With new equipment installed throughout the plant is in good condition to take advantage of the favorable market for coke, and the firing of the ovens will be undertaken at once.

Indiana—It is stated that 3,000 additional men are needed in the Indiana County coal field. The coke ovens at the Ernest operations were recently fired for the first time in two years.

Uniontown—The Bird Coal Co. is making extensive improvements at its plant near Kelso.

WEST VIRGINIA

Charleston—Earl Henry, chief of the Department of Mines, recently announced that 16 men had been awarded first-class certificates from among more than 100 who recently took examinations here to become mine foreman. One man, George F. Carbough, of Carlisle, passed as a fireboss.

Boomer—Nineteen men are reported killed and 11 more are unaccounted for as the result of an explosion in the No. 2 mine of the Boomer Coal and Coke Co. on Nov. 30. Thirty miners were brought to the surface alive, and at last accounts hopes were entertained that more men might be rescued.

ALABAMA

Birmingham—The car shortage, while not acute, is being felt by the shippers, and fear is expressed that December and January will bring about a serious shortage of equipment. The railroads are endeavoring to prepare themselves for any such emergency and are bending every effort to avoid such a condition.

The Tennessee Coal, Iron and R.R. Co., in the Birmingham, Ala., district, is discontinuing the payment of machine men for coal cutting in the coal mines on a tonnage basis and is paying them by the day, the scale fixed for machine runners being $3.75 per day. It is thought that some of the other coal companies in the district will follow the same plan.

KENTUCKY

Seco—The South East Coal Co.'s initial shipments now going out are destined to Detroit for distribution to the Great Lake trade. Much of the product of the South East mines will go to the markets of the North and Northwest, as well as the Great Lake trade.

Fleming—It is said that the consolidation of the Elk Horn Mining Corporation and the Elk Horn Fuel Co. into the Elk Horn Coal Corporation with something over $28,000,000 capital will mean greater things in the development of coal land holdings in the eastern Kentucky field. The company owns a boundary of 200,000 acres lying in Letcher, Pike, Knott, Floyd and Magoffin counties. At present this company is putting out at the rate of 1,500,000 tons annually. Within the next few months the company will be putting out coal at the rate of 3,000,000 tons annually.

Whitesburg—The South East Coal Co. has begun operations on a lively scale between Fleming and Kona on Boone's Fork.

According to Perry County operators the production of that field will be doubled by the first of the year. The First Creek Coal Co., the Harvey Coal Co. and the Kentucky Block Coal Co. are three new companies which will be responsible for the increase.

Hazard—Preparations are being made to increase the output of the old North Fork Coal Co.'s operation, bought recently by the Daniel Boone Coal Co. New miner's houses are being built and a new field will be opened up.

OHIO

Athens—The New York Coal Co. has filed suit against the Sunday Creek Coal Co. and others, alleging its lease to the defendant company of certain coal lands, with the equipment used in operating them, and the removal by the defendants of this equipment, consisting of cars, rails, etc. A restraining order preventing the removal of further property of this nature has been issued. The New York Coal Co. bases its case on a provision which it alleges to be contained in its leases, prohibiting the removal of the personal property in the mines under certain conditions.

INDIANA

Terre Haute—Fire recently destroyed the tipple and adjoining buildings of the Vandalia Coal Co.'s mine at Liggett, causing a loss of about $6,000. The cause of the fire is unknown. No one was injured. Chemical engines and hose trucks were sent from Terre Haute and prevented the spreading of the fire. The buildings destroyed will be replaced.

Boonville—The stripping machines at the Sunlight Coal Co.'s property and the Polk Patch coal mine are working day and night and are unable to fill all orders.

Sullivan—Orders have been received from the Federal Court by the receiver to lease the Glendora mine of the Consolidated Indiana Coal Co. to the Interstate Mining Co. at a royalty of 5c. a ton on a minimum of 30,000 tons annually and the St. Clair mine to the St. Clair Coal Co. at the same royalty on a minimum of 20,000 tons.

ILLINOIS

Virden—Nov. 22, fire completely destroyed the hoisting shaft, tipple and coal washer of the Chicago, Wilmington & Franklin Coal Co., entailing a loss estimated at $200,000. Three miners were seriously burned. It is thought the fire was of incendiary origin having started in the weighhouse near the top of the tipple where evidence of burning oil was seen.

Williamson—An eccentric slipped on the engine while 10 men were being lowered Nov. 22 in the No. 2 mine of the Mt. Olive & Staunton Coal Co., the cage falling to the bottom of the shaft. It was only a few feet from the bottom when the machinery became disarranged. All of the 10 were hurt, but only three were sent to the hospital.

Maryville—The top works of the Donk mine at this place were recently saved by a bucket brigade when threatened by fire which destroyed the public school building. Lack of water in the fire cisterns of the town increased the danger to the mine property.

COLORADO

Denver—The Delagua Mine (Las Animas County) of the Victor-American Fuel Co. has been running full time during the past month. Production in Routt County is progressing rapidly as is natural in a comparatively new field. There is a small car shortage at present but a greater one is feared.

FOREIGN NEWS

Lethbridge, Alberta—An action for foreclosure has been brought in the Supreme Court of Alberta against the Canadian Coal & Coke Co. by the Royal Trust Co. for the bondholders, the amount involved being $3,000,000. The stock of the Canadian Coal and Coke Co. is held principally in Montreal, the firm holding valuable coal leases near Lethbridge and elsewhere in Alberta. It is alleged that no interest has been paid on the bonds.

Glace Bay, N. S.—The output of the Nova Scotia coal mines has been seriously affected by the enlistment of miners. F. W. Gray, of the Dominion Coal Co. has brought this matter to the attention of the Canadian authorities. He states that his company alone has furnished some 1,500 men, or 14 per cent. of the total number employed. This has resulted in a diminution of the coal output of approximately 17 per cent.

Sydney, N. S.—Coal shipments from Sydney to St. Lawrence ports have closed for the season, and the total volume shows a considerable shortage as compared with 1914. The amount shipped is approximately 1,500,000 tons, or some 400,000 tons less than shipments for last year. One cause for the falling off is the requisitioning by the British government of the vessels chartered by the company.

PERSONALS

R. G. Harris, for a number of years with the Davis Colliery Co., recently became a member of the sales force of the Cortright Coal Co., of Philadelphia.

Edward Coyne, of Ottumwa, Iowa, has been appointed by the State Board of Control to prospect for coal on the Flynn farm near Des Moines, and on the state farm at Knoxville.

J. L. Heizer was recently appointed chief clerk of the Department of Mines of West Virginia to take the place of W. L. Thomas. Mr. Helzer will assume the duties of chief clerk at once.

John Whelan, Jr., former superintendent of the Massillon Coal Mining Co.'s mines at Massillon, Ohio, has been appointed secretary of the Eastern Ohio Operators Association. Mr. Whelan will assume his new duties Jan. 1.

Howard D. Pfeiffer, general manager of the Chaffee Coal Co., Real Estate Trust Building, Philadelphia, Penn., recently incorporated as H. D. Pfeiffer & Co. for the purpose of acting as the sales agency for Chaffee coal and trading in other fuels.

Benjamin Timey, formerly assistant foreman at the Philadelphia & Reading Coal and Iron Co.'s Potts Colliery, was Nov. 24, appointed superintendent of the North Franklin Colliery. This plant is one of the largest and most complete in the Schuylkill region.

A. D. Macfarlane, of LaFollette, Tenn., chief engineer for the receiver of the LaFollette Coal, Iron and Ry. Co., was on a trip the early part of this week to Birmingham and Tuscaloosa, Ala., inspecting coal washers and getting data on coal washing operations.

A farewell dinner was given, Nov. 23, at the Planters Hotel, St. Louis, Mo., by men prominent in local coal circles and long time friends, in honor of A. J. Moorshead, president of the Madison Coal Corporation who will shortly remove to Chicago after many years of activity in St. Louis.

Frank Kettle, of Nanticoke, John B. Corgan, of Luzerne, and John J. Stickler, of Lansford, were named on Nov. 26, as the new mine inspectors to fill the vacancies created for Luzerne and Carbon Counties, Penn., by the act of June 1, 1915, to serve until their successors are duly elected and qualified, subject to district assignment by James E. Roderick, Chief of the Department of Mines.

Samuel Reynolds, 71 years old, resigned his position as slope engineer of Nottingham colliery, Plymouth, Penn., on Nov. 26, a position he held for 36 years and 6 months. Mr. Reynolds deciding to take life easy, resigned his position, purchased a small automobile in which to enjoy the surrounding country. In point of service Mr. Reynolds was the oldest engineer in the employ of the Lehigh & Wilkes-Barre Coal Co.

William E. McGann, inside foreman of the Buck Mountain Colliery of the Lehigh Valley Coal Co., had his skull fractured, and Thomas R. Jones, division superintendent of the Delano & Pottsville division of the Lehigh Valley Coal Co., was injured internally on Nov. 24, when their touring car and a Philadelphia & Reading Ry. engine collided. McGann's condition is critical. His skull was crushed in, and an operation by trepanning was performed. Mr. Jones' condition is reported as serious. The accident occurred when the touring car ran on the crossing in front of the engine, which was returning from one of the Philadelphia & Reading collieries.

OBITUARY

Dennis Reardon, for many years a member of the mine examining board of Pennsylvania, died recently at his home in Shamokin at the age of 51 years. Mr. Reardon had been in failing health for almost a year but his condition was not regarded as serious until shortly before his death.

J. M. Hedge died in Chicago, Ill., on Nov. 23, at the age of 58 years. For ten years Mr. Hedge was traveling salesman for E. L. Hedstrom & Co., and for the eight years past was Western traveling salesman for the Philadelphia & Reading Coal and Iron Co., being attached to the Chicago office. He is survived by a widow and two daughters. Interment was made at Cape Cod, Mass.

Louis Kortkamp, manager of a mine at Hillsboro, Ill., was recently killed in an accident there after he had gone into the mine to make an inspection. A train of coal cars was being hoisted up a slope, and three of them became uncoupled near the top. Mr. Kortkamp was instantly killed when the cars struck him. His brother, Carl Kortkamp, was killed in the same mine and in the same manner about a year ago.

William A. Fuller, aged 45 years, died at his home in Hazleton, Penn., on Nov. 25, after a short illness of complications. He was superintendent of the Hazle Mountain Coal Co.'s workings at Buck Ridge and Tomhicken. Taking charge 20 years ago when the Wentz interests had abandoned the "drowned" mines, he reclaimed all of the unmined coal by preventing a creek from flowing into the workings. Mr. Fuller's remains were taken to Scranton, where the funeral took place from the home of his sister Mrs. Storrs.

INDUSTRIAL NEWS

St. Louis, Mo.—The Illinois Public Utilities Commission has assigned Dec. 21, 22 and 23 for the coal interests to present their case against the carriers in opposition to the proposed general advance in soft coal rates within the state of Illinois.

Milwaukee, Wis.—The Jeffrey Mfg. Co., of Columbus, Ohio, has recently opened a new branch office in the M. & M. Bldg., Milwaukee, Wis. This office will be in charge of A. Q. Dufour, who has had long experience and training in the application of Jeffrey products.

St. Louis, Mo.—The Illinois Public Utilities Commission has ordered the Baltimore & Ohio Southwestern Ry. Co., to reduce its rates on soft lump coal from Breese and Beckemeyer, Ill., to Lawrenceville, Ill., and intermediate points. The new rate will be 55c. per ton.

Alton, Ill.—The Alton, Granite City & St. Louis Traction Co. has just completed at its Alton steam plant a storage pit for 30,000 tons of coal which it expects to store under 2 ft. of water. The pit is expected to hold coal enough for the operation of that plant for 60 days.

Big Creek, W. Va.—The Lincoln Coal Mining Corporation, of Fairmont and Big Creek, W. Va., is putting out a $50,000 bond issue for the purpose of completing plant equipment and building additional houses in order to take care of the demands for coal which it is now receiving.

Thomas, W. Va.—The Bradford breaker of the Davis Coal & Coke Co. at this place was recently burned. The origin of the fire is unknown, but is believed to have been incendiary and for the purpose of crippling the supply of coal to the byproduct ovens of the Bethlehem Steel Co.

Philadelphia, Penn.—The East Broad Top R.R. is erecting a new transfer station at Mount Union, Penn., for transferring coal from narrow gage to standard gage railroad cars. The new station will contain a Link-Belt shaking screen and picking table and will cost approximately $45,000.

Buffalo, N. Y.—On and after Dec. 1 the Buffalo Foundry & Machine Co., manufacturers and builders of various varieties and types of chemical apparatus, driers, dry vacuum pumps, condensers, steamhammers, etc., will open an office in New York City in the Whitehall Bldg., at 17 Battery Place.

Philadelphia, Penn.—The Rock Hill Iron & Coal Co., 437 Chestnut St. Philadelphia and Huntingdon, Penn., will in the next few years spend approximately $500,000 to double the production of the Broad Top mine. This firm is now driving tunnels, purchasing steam and electrical equipment, etc., to this end.

St. Louis, Mo.—Missouri Pacific Ry. schedules increasing carload soft coal rates from Kansas City, Mo., to Pittsburg, Kan., and between other points in Interstate traffic were suspended Nov. 20, by the Interstate Commerce Commission until Mar. 21, next. The increases range from 65c. to $1.45 per ton.

Springfield, Ill.—Officers were recently elected by the Illinois Mining Institute as follows: President William Burton, Herrin; first Vice-President, Fred P. Haler, Belleville; second Vice-President, Patrick Hogan, Canton; Secretary and Treasurer, Martin Bolt, Springfield; Herrin was chosen as the place of next meeting.

Philadelphia, Penn.—George F. Lasher, William B. Whelen, and John Gilbert, trustees, of 147 No. 10th St., Philadelphia, wish to sell somewhat over 37,000 acres of Pocahontas coal, estimated as containing 242,000,000 tons. This tract lies in McDowell and Wyoming counties of West Virginia, and is provided with railroad facilities.

Cincinnati, Ohio—The C. G. Blake Coal Co., consignor of the cargo of coal on board the steamer "Genesee," which was recently seized by a British cruiser while bound for Montevideo, announces that it is fully protected in the matter by both ordinary and war insurance, and that the cargo, moreover, was legally the property of the consignee at the time of the seizure.

Uniontown, Penn.—A deal has been consummated between L. F. Ruth, J. M. Grey, K. K. Kremer, R. S. Matthews, E. K. Dick, all of Connellsville, whereby title to 400 acres of coal located in Morgan Township of Green County is acquired from W. R. Hawkins, and associates. The transaction involves an amount of approximately $300,000, some of the coal bringing as high as $800 per acre.

Detroit, Mich.—The Western Electric Co. has changed its Detroit headquarters from 263 Franklin St., to Kirby & Dequindre St. The new building is two stories high, and has a frontage of 150 ft., and a depth of 130 ft., and adjoins the Grand Trunk Ry. The change from the old quarters has been occasioned by healthy business growth which reached such proportions that the Franklin St. location became inadequate.

Baltimore, Md.—Contracts have been let by the Baltimore & Ohio for the construction of its new coal pier at Curtis Bay, Baltimore, which will cost approximately $1,500,000. All the work will be started at once, it being expected that the new improvement will be ready for operation during the season of 1916. The pier will have a capacity of 10,000,000 tons a year and will be the largest structure of its kind ever planned.

Wheeling, W. Va.—It was announced here recently that navigation companies on the Great Lakes were unable to handle the large amount of coal now flooding the docks. It is expected that word will be received shortly to annul all shipments. The shipments of some railroads have fallen off recently due to the docks and lake ports being filled to capacity and lake freighters being held up on account of the weather.

Fairmont, W. Va.—The management of the Western Maryland Ry. Co., has had to increase its order for new equipment. A contract for 1,000 additional steel hopper cars has been placed with the Pullman Co., of Pullman, Ill. An order for 2,000 steel hoppers was given this same company about a month ago. It is stated that the railroad is doing an immense business, and that a year from now it expects to do twice as much as it is doing at present.

New York, N. Y.—The Standard Paint Co., manufacturers of P. & B. insulating tape, has placed upon the market a rubber friction tape under its IMP brand. This tape will not compete with, or in any way displace the P. & B. tape. It is treated with a rubber compound, and finished by the friction process, and it is suitable for all kinds of wiring work. The older P. &. B. tape is especially adapted for severe atmospheric and weather conditions.

St. Louis, Mo.—R. W. Ropiequet, attorney for the Coal Operators Traffic Bureau of St. Louis has withdrawn complaint before the Interstate Commerce Commission, Docket No. 8,263, Coal Operators Traffic Bureau of St. Louis, Southern Coal, Coke and Mining Co., Lumaghi Coal Co. et al. Chicago, Burlington & Quincy R.R. alleging discrimination in differentials as between groups in Illinois. It is understood a satisfactory adjustment has been made.

St. Louis, Mo.—Officials of railroads operating eastward from Chicago and St. Louis report a heavy general tonnage, and some sections are short of cars. At the same time, the roads are hauling many empties westward. The great manufacturing districts reflect further activity, but aside from these influences there has been little change in the traffic situation on these lines during the past week. Officials of Southern roads report further gains in general tonnage which now is about 4 per cent. larger than in 1913.

Philadelphia, Penn.—The business of the Maryland Coal & Coke Co., in New England, that has heretofore been handled through the Boston office, will, in the future, be handled through the New York office. George E. Dunn, formerly New England agent at Boston, has been appointed manager of the New York office with headquarters at 17 Battery Place, New York City. William S. Johnson has been appointed assistant manager of the New York office. On or about Mar. 1 next, the company's office in Boston will be discontinued.

Birmingham, Ala.—The No. 4 furnace of the Sloss Sheffield Steel and Iron Co. was blown in on Nov. 26. This furnace has a capacity of 250 tons per day, and with the four other furnaces in blast will give this concern an output of 1,250 tons per day of iron. This is the first time in many years that both furnaces of this company have been in blast at North Birmingham at the same time, but the condition of the iron market made it expedient to put another furnace into blast. This furnace was relined and overhauled before going into blast.

Barbourville, Ky.—The general contract for construction and track laying of the Cumberland & Manchester R.R. from the Louisville & Nashville R.R. at Barbourville, to Manchester, Clay County, has been let and work on construction has begun, the line to be completed by the first of next July. The line will have a total length of 24 mi. and will open a large bituminous and cannel coal field, besides making a billion feet of hardwood timber available for market. Charles F. Heidrick, of Brookville, Penn., and Barbourville, Ky., is president of the Cumberland & Manchester R.R.

Reading, Penn.—The final chapter in the history of the Temple Iron Co. was recently completed when the Temple Furnace was sold to H. H. Adams, representing New York interests. It was the charter of the furnace company granted many years ago by the state that permitted the formation of the many underlying companies which it was claimed constituted the so-called coal trust and which the Government ordered dissolved through the courts over a year ago. The mining properties of the company were sold shortly after the decree of dissolution was granted and the recent sale of the furnace completes the compliance with the order of the court.

Wilkes-Barre, Penn.—The Lehigh & Wilkes-Barre Coal Co. has sent the following circular to its customers:

> The Supreme Court of Pennsylvania, on Oct. 28, 1915, declared unconstitutional the act of June 27, 1913, imposing a tax of 2½ per cent. on the value of anthracite coal prepared for market. When assured by the Commonwealth of Pennsylvania that no further proceedings will be undertaken to enforce payment of this tax, the amount of tax collected by this company, under the act, will be refunded. The tax now being added to the price of anthracite coal sold by this company is imposed by a later act of the Legislature of Pennsylvania, approved June 1, 1915, which supersedes, as of that date, the act recently declared unconstitutional. The validity of the later act has not been determined.

Sandusky, Ohio—The Big Four R.R. Co. is now planning to spend approximately a million dollars or more on dock improvements at this place. Plans are being exhibited, and the first informal announcement relative to the matter was recently made. When these docks are completed, Sandusky will rank among the first of the coal shipping ports to the Great Lakes. Present plans provide for the reclamation of a large tract of shore land, and the erection of a car dump which will make it possible to load several freighters with coal each day. Toledo is now considered as being one of the largest coal ports on the lake, but it would appear that in a few years Sandusky will be a close rival.

Birmingham, Ala.—The Pratt Consolidated Coal Co., will inaugurate barge service for the transportation of coal from Cordova to Mobile on the Warrior River as soon as specially constructed barges are available. A contract has just been awarded for the construction of 10 barges to a Mobile shipbuilding concern. These barges will be built under special design of the company and will cost several thousand dollars each. The company is now operating a weekly barge service on the Warrior River from Maxine to Mobile. The greater facilities for handling coal on the Warrior River due to construction of the 10 new barges and the increased river traffic that will result, are expected to have a bearing on the freight rate situation in Alabama.

Philadelphia, Penn.—An increase of more than 40 per cent. in coke shipments is the feature of the report of the coal and coke tonnage carried on the lines of the Pennsylvania R.R. east of Pittsburgh for October. Coke tonnage for that month totaled 1,225,848 tons, a gain of 509,838 tons over the same period last year. The carriage of anthracite aggregated 1,084,739 tons, or 37,399 tons ahead; bituminous coal shipments amounted to 4,304,466 tons, an increase of approximately 7 per cent. Aggregate fuel shipments in October amounted to 6,615,053 tons. Since Jan. 1 these three commodities have furnished tonnage to the amount of 54,275,580 tons. Only in coke, however, has an increase been registered in the 10 months' shipments over those of a year ago. In this respect coke has shown a gain of 1,326,556 tons.

Belleville, Ill.—A deed for the transfer of six coal mine properties, three in St. Clair County and one each in Perry, Washington and Randolph Counties, was filed in the recorder's office at Belleville recently. The deed is made by the Bessemer Washed Coal Co. to the Bessemer Coal and Mining Co. and the consideration is fixed at $127,700. The transfer includes the Bessemer coal-washing plant south of East St. Louis. The new company's main office will be in St. Louis. The mines in St. Clair County turned over are the Lenzburg, Marissa, Advance and New Oak Ridge mines, all on the Illinois Central Ry. south of Belleville. Leases on about 2,000 acres of coal land are included. William Stevenson, of Tilden, Ill., secretary of the new company, said the plan is to absorb the overhead charges of all the mines by one management and operate all the properties, including the washer in East St. Louis.

Coal Trade Reviews

General Review

Anthracite trade uncertain and hinging on weather conditions. Railroad embargos force bituminous buyers to cover. Exports at a standstill. Closing of Lake navigation finds the market strong. Cold snap causes an urgent demand in the Middle West.

Anthracite—The situation in the hard coal trade is indeterminate, fluctuating almost daily according to weather conditions. Supplies at the principal distributing centers are obviously small, and a sharp decline in temperature, sustained over any appreciable period, would undoubtably result in a critical situation. The car supply outlook is growing more ominous each day and some of the large companies have already been forced to draw on their storage supplies for the prepared sizes. At the present time the market hinges on the inadequate transportation facilities and any deficiency in supplies that develop at this time will be exceedingly difficult to overcome later in the season. The full company circulars are generally well maintained in spite of the relatively poor demand.

Bituminous—The reactionary tendency in the soft coal market has been wiped out by further unfavorable developments in transportation circles which has steadied up the market in a satisfactory manner. Sales agencies have placed a decidedly pessimistic construction on the announcement of the recent embargoes by a number of the leading trunk lines. The supply shows no increase and some of the best-protected sellers have been forced into the prompt market for tonnages to fill out gaps in their contract obligations. Hopes for some relief are anticipated when Lake navigation ceases, it being estimated by some that 25,000 cars will be released for other uses. Storms and heavy weather, combined with the shortage of vessel tonnage, have seriously interfered with the coastwise movement.

Exports—As a result of the combined effects of the unprecedented high ocean freights and the submarine warfare in the Mediterranean, shipments to Italian ports seem to have dropped off completely. Vessel rates continue to advance with monotonous regularity and each week finds them firm at new high levels. A few steamers are still being chartered, but this business can only be done where prospective shippers have firm orders on hand. The movement over the Hampton Roads piers for last week showed a gratifying increase, though still substantially below recent averages; shipments from other points have touched the lowest figures for several years.

Lake Markets—The Lake markets have stood up under the effects of the cessation in Lake shipping in unexpectedly good form. Sellers are in definite control of the prompt market, prices in which are firm with a buoyant tendency. Occasional odd tonnages of coal, diverted from the Lake trade, are subject to some pressure, but not of sufficient proportion to affect the general situation. The final Lake shipments were considerably delayed and irregular as a result of heavy storms, which accentuated the scarcity of vessel tonnage, but in spite of this there was a sharp rush at the close of navigation, receipts at the upper ports being unusually heavy. Railroad embargoes have persisted, and while no actual shortage has resulted as yet, there are some districts entirely cut off from shipments, in which difficulties will be experienced shortly.

Middle West—The recent lower temperatures have precipitated a flood of wire orders from outlying districts urging prompt shipments, which substantiate recent opinions regarding small stocks in the hands of the retailers. Many operators are sold up to their full rated capacity for 30 days ahead and report orders steadily increasing as the season advances. Screenings have stiffened up notably, while other grades are showing a strong disposition to act in sympathy. The steam demand is expanding in an impressive manner, while car and labor shortages continue impelling factors on the constructive side of the market.

A Year Ago—Warm weather threatens the anthracite market with a general slump. Bituminous situation dull and no improvement in sight. The Middle Western market beginning to stiffen up noticeably.

BUSINESS OPINIONS

Boston News Bureau—The situation in its entirety is acting as one would suppose it would in view of all the existing conditions. General trade is demanding more thought and attention, and this has the call over all other considerations. This country never saw such a combination of favorable features before in its history. With the new year we should witness an activity far above any previous estimate, spreading to every line of trade. New financing is occupying the attention of the financial interests to the exclusion of the stock market. The convening of Congress naurally modifies somewhat optimistic sentiment. But there is much that Congress can do to help confidence.

Iron Age—The pressure from manufacturing consumers for protection on contracts they have taken has led producers to book considerable finished material in the past week for the third and fourth quarters of 1916. The higher prices asked did not deter the buyers, plates and shapes for cars being sold at 1.85c., Pittsburgh, as against 1.70c. on first-half contracts. New export business has been checked by the action of leading producers in refusing offers from abroad of several dollars a ton above domestic prices, also by the railroad embargo and the stringency in the ocean freight situation.

Bradstreet—Nearly every prospect seems to please, and a year that started under a cloud of uncertainty or depression is ending with productive energies moving at high speed. This week's reports, reflecting as they do cumulative growth in trade and industry, display a marked degree of snap, the situation in general being the best noted for a long time past. Misgivings as to the immediate future are negligible, in the leading industries operations are being pushed to the utmost, labor is scarcer and payrolls are heavier.

Dun—Widely divergent lines in all sections reflect a sustained growth in business movements and volumes. Manufacturing operations still broaden, with overtime in force in many instances, while retail distribution steadily enlarges under the stimulus of increased payrolls and continued low temperatures. As the season advances, holiday goods become a more conspicuous feature and there is every indication that results in this particular branch will prove exceptionally gratifying.

Southern Lumberman—Price changes during the past week are again few, though there has been a somewhat larger spread in prices received by the various mills according to the stocks on hand at those mills. Somewhat higher prices than those quoted are reported by some mills, particularly Alabama operations, on certain items of dressed stock, while a very occasional report is made of a somewhat lower price offered on particular items by other mills.

Dry Goods Economist—Firmness, with a seasonable degree of activity, characterizes practically all of the dry goods lines. The prospects for an unusually large Christmas business are filling most retailers with optimism. The cotton market has been quiet, but firm. Exports of raw cotton for the nine months ending Sept. 30 last, reached a value in round numbers of $300,000,000 against $242,000,000 for the corresponding period of last year. Raw wool continues firm.

American Wool and Cotton Reporter—Although a smaller volume of sales was consummated during the past week because dealers have marked up prices, the wool market remains fully as firm as it has been for several weeks. So much wool has been taken and as there are several shortages what wool is left will bring high prices. By Jan. 1 it is expected that stocks will be light. Woolen mills are very busy with orders booked several months ahead, and it is stated that one manufacturer has a year's business to take care of.

Marhall Field & Co.—Current wholesale distribution of dry goods has exceeded the record of the corresponding period of a year ago by a considerable margin. Road sales for immediate and future delivery have been greater than for any year since 1909. Customers have been in the market in about equal numbers. Collections are above normal. Prices are firm.

ATLANTIC SEABOARD

BOSTON

Weather interferes with shipments from Hampton Roads. On car prices higher because of water freights, but canvass for next year contracts at minimum figures. Georges Creek receipts light. Pennsylvania coals easier. Delays on anthracite.

Bituminous—Storms and thick weather have practically deadlocked shipments along the coast. Boats are in very short supply and there is apprehension over the outlook a month or two hence. At the same time New England probably has better stocks than other sections. Prices on Pocahontas and New River show no change f.o.b. with an ample tonnage standing at all the piers. No spot market of any consequence has developed, f.o.b. Hampton Roads, and there is not likely to be any until marine transportation gets somewhat straightened out.

On cars at Boston, Providence and similar points prices have advanced materially on account of higher water rates, but inquiry so far is confined largely to distributors who are buying to keep customers going until cargoes arrive.

The canvass for contracts from Apr. 1, 1916, is still on; $3.30 on cars Mystic Wharf, Boston, is the lowest price yet heard, although this was for fairly large tonnages. Smaller contracts are being closed at $3.40@3.50. A few more good sized orders have been closed on a delivered basis and it begins to look as if the usual contract season next February or March would be conspicuous by its absence. A lot of quiet work has been done and so keen is the rivalry for tonnage that most buyers are likely to get their fuel at lower prices than for several years.

Receipts of Georges Creek by water are also being hampered by the weather, but no scarcity is felt as yet. Deliveries all-rail are coming through very slowly.

Higher prices on the Pennsylvania coals are bringing out many offers of spot coal. The shippers of the higher grades are limiting their shipments to contract business, preferring to get some of their obligations behind them now and have their free coal later, if at all, when prices are expected to be even higher. Car supply is little if any improved on most roads and some of the largest buyers are being forced into the market for coal known to be at or near the transfer points; $1.75 is about the price for the better Cambrias and Somersets, while almost any of the Clearfields, if spot, will command $1.35@1.50.

Water Freights have further advanced to $1.25@1.35, Hampton Roads to Boston, on large vessels, but with few bottoms offering; $1.20 has been paid Norfolk to Providence, other rates in proportion, while 60@70c. is the range from New York ports to Providence and New Bedford, with an active demand.

Anthracite—The shipping companies are being flooded with orders, particularly since buyers have become aware of the delays in getting cargoes off. It is a shortage of transportation rather than coal, and when one to two trips are lost it is hard to make good the deficiency so late in the season. The outlook is excellent for brisk trade throughout the winter.

Bituminous quotations, f.o.b. loading ports at points designated, are about as follows:

	Philadelphia	New York	Baltimore	F.o.b. Mine
Clearfields	$2.50@3.00	$2.75@3.30	....	$1.25@1.75
Cambrias and Somersets	2.60@3.05	2.90@3.35	....	1.35@1.80
Georges Creek	2.92@3.25	3.22@3.55	$2.85@3.18	1.67@2.00

Pocahontas and New River prices, on cars Boston, are $3.75@3.90; Providence, $3.75@3.85; and f.o.b. loading ports at Hampton Roads, $2.80@2.85.

NEW YORK

Warmer weather causes anthracite demand to ease up. Tidewater docks generally bare of coal. Steam coals active. Bituminous short and prices increasing. Coal delayed in delivery. Free coals bringing $3 f.o.b.

Anthracite—The hard coal is quiet, but supplies are so short that a sudden demand would result in a serious situation. Present conditions are the exception for this time of the year; the car shortage seems to become more acute and this, together with the shortage in the year's production, has resulted in an unusual situation. Complaints of lack of cars are increasing. Most individual operators have sufficient orders to carry them over several weeks, but they are seriously handicapped by the inadequate car supply. The local roads continue badly congested.

Most wholesale dealers are short of coal, while large retailers, who as a rule need not worry about shipments, are making inquiries as to the situation and the prospects. Egg coal is the only prepared size offering at less than full circular. Straight cargoes of stove coal bring slight premiums and chestnut is moving well. The steam grades are active and prices remain firm. Buyers of the buckwheat coals are being advised to store all they possibly can get at prevailing prices.

Current quotations, gross tons, f.o.b. Tidewater, follow:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$5.05		$5.10	
Egg	5.30	$5.20@5.30	5.35	$5.25@5.35
Stove	5.30	5.30@5.30	5.35	5.35@5.35
Chestnut	5.55	5.55@5.55	5.60	5.55@5.60
Pea	3.50	3.45@3.50	3.55	3.50@3.55
Buckwheat	2.75	2.45@2.75	2.80	2.45@2.80
Rice	2.25	1.95@2.25	2.30	2.00@2.30
Barley	1.75	1.50@1.75	1.80	1.75@1.80

Bituminous—Prices continue to advance and still higher figures are looked for. Arrivals are greatly delayed by the congestion along the various trunk lines and there is little free coal at the docks. Operators last week obtained about 60% of the usual car supply. Little coal is being stocked, all the available supply being applied direct to contracts. Free coals are snapped up quickly and there is little to be had by the spot buyer. The cheaper grades are bringing from $2.90 to $3 f.o.b., and mine prices have advanced correspondingly. Some of the better grade coals are practically out of the market. Slack continues strong at from $1.05 to $1.15 with occasional quotations of 10c. higher.

Water freights are strong. The first of the week they had touched $1.05 to Sound points, while an average of 25c. was quoted around the harbor.

Current quotations, gross tons, f.o.b. Tidewater, are about as follows:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.20@3.30	$3.20@3.30	$3.20@3.30	$1.75@1.85
Georges Creek Tyson	3.20@3.30	3.20@3.30	3.20@3.30	1.65@1.75
Clearfield:				
Medium	3.00@3.05	3.00@3.05	....	1.45@1.50
Ordinary	2.90@3.00	2.90@3.00	....	1.35@1.40
Broad Top Mountain				1.25@1.45
Cambria County:				
South Forks	3.20@3.30	....	....	1.65@1.75
Nanty Glo	3.20@3.30	....	....	1.65@1.75
Barnesboro	3.10@3.20	....	....	1.60@1.70
Somerset County:				
Quemahoning	....	3.20@3.30	3.20@3.30	1.65@1.75
Medium	3.00@3.20	3.00@3.20	3.00@3.20	1.50@1.65
Latrobe	2.90@3.00	....	....	1.35@1.45
Greensburg	2.00@3.10	....	....	1.35@1.45
Westmoreland	3.20@3.30	....	....	1.45@1.55
West Virginia Fairmont ¾		2.90@3.00	2.90@3.00	1.10@1.20
Fairmont mine-run		2.80@2.90	2.80@2.90	1.00@1.10
Steam		2.90@3.00	2.90@3.00	1.35@1.45
Western Maryland		2.90@3.00	2.90@3.00	1.35@1.45

PHILADELPHIA

Anthracite moving steadily. First storage coal shipped. Stove leads prepared sizes, with chestnut beginning to show strength. Egg weak. Heavy shipments of pea. Car shortage advances bituminous prices. Some relief expected when Lakes close. Exports quiet.

Anthracite—Business is moving along steadily. There has been very little price cutting in the wholesale market, but the retailers have shown very little inclination to increase their prices. Pea coal which continues the main point of attack will surely cost the dealers at least 25c. per ton more after Dec. 31. Most of the large dealers will go into the new year with capacity stocks of this size bought at the low price and it is hoped that the price-cutters will not sacrifice this advantage.

Considerable storage coal has come to this market, especially from one of the larger companies. Another big company has also been sending large quantities of storage pea and buckwheat to market, the former due to the approaching advance in price, and the latter due to the increasing demand from steam users. Storage yard coal is not usually in much favor, but the prepared grades which have been shipped were re-screened and washed.

Collections continue satisfactory, both the wholesale and retail houses giving them careful attention. Sales by the price-cutters are for cash only; it has been the practice with a good many of the better firms, to sacrifice 25c. per ton for cash. It seems strange, however, that no matter how notorious for poor pay either a dealer or consumer has become, there is always a shipper or dealer who will take a chance.

The demand for broken coal continues and all that not sold on contract at $3.25 and tax is bringing the full price of $3.50 and tax; it is also rumored that there will be made an advance of from 10c. to 20c. per ton on new contracts.

At present egg seems to be the weak spot and even small sales were recently made at from 15c. to 25c. off circular.

Stove is probably the leader of the prepared sizes and seldom sells off price. Chestnut grows more popular as the season advances and while slight concessions are occasionally made the good grades are up to the full circular.

Pea is certainly in strong demand and the dealers protected until Dec. 31 at the $2 and tax rate are putting away every car they can and in many instances the stocks of the large sizes are being reduced and the extra bin room devoted to the pea size. This naturally lessens the demand for the larger sizes though the bins will be refilled soon after the first of the year.

The prices per gross ton at the mines and f.o.b. Port Richmond for tide shipments are as follows:

	Line	Tide		Line	Tide
Broken............	$3.50	$4.75	Pea...............	$2.50	$3.25
Egg..............	3.75	5.00	Buckwheat.........	1.50	2.25
Stove.............	4.00	5.00	Rice..............	.85	1.75
Chestnut..........	4.15	5.25	Barley............	.50	1.50

Bituminous—The market continues to be dominated solely by the car supply and there is a gradual creeping up of prices toward the $2 mark. While there was apparently no general increase this week, yet new prices were asked for a number of the better grades. The principal change was in Georges Creek, which advanced from 10 to 15c.

The demand for fuel continues good, with supplies difficult to get, as many shippers state they are only receiving from 27% to 40% of the cars needed at their mines. The only hope of early relief is held out in the fact that usually in December of each year there is an easing up in the car supply owing to the closing of navigation on the Lakes, which will release about 25,000 cars. The export trade continues quiet.

The prices per gross ton at the mines have ruled about as follows:

Georges Creek Big Vein..	$1.85@2.00	Fairmont gas, ¾.........	$1.35@1.45
South Fork Miller Vein..	1.65@1.75	Fairmont gas, mine-run..	1.20@1.25
Clearfield (ordinary).....	1.40@1.50	Fairmont gas, slack......	1.00@1.10
Somerset (ordinary).....	1.40@1.50	Fairmont lump, ordinary.	1.15@1.20
West Va. Freeport.......	1.35@1.40	Fairmont mine-run......	1.05@1.10
		Fairmont slack..........	1.00@1.10

BALTIMORE

Export trade flat. Car movement poor and contracts are back. Indifferent demand keeps prices low.

Lack of vessel bottoms and impossible freight rates of from $18 to $20 a ton to Mediterranean ports, and in proportion to other points, has killed the export coal movement for the time being. The past week saw a total of but 1,135 tons loaded here for foreign delivery, the smallest in several years.

Operations in the Fairmont and Somerset districts have been down to not more than a 30% capacity due to poor car supply. Most operators and middlemen are now behind on their contract obligations. Practically all unattached coal is being taken up to fill in gaps on contracts.

Prices in gross tons to the trade may be quoted about as follows:

	Mines	Balt.*	Fairmont	Mines	Balt.*
Geo. Crk. Big Vein	$1.80	$2.98	Ordinary mine run	$1.00	$2.43
Geo. Crk. Tyson...	1.50	2.68	Ordinary ¾.......	1.10	2.53
Clearfield.........	1.30	2.48	Ordinary slack....	.95	2.38
South Fork.......	1.45	2.63	Low sulphur mine-run........	1.25@1.30	2.68@2.73
Latrobe..........	1.25	2.43	Low sulphur ¾....	1.40	2.83
Somerset (best)...	1.45	2.63	Low sulphur slack..........	1.00	2.43
Somerset (good)...	1.25	2.43			
Quemahoning.....	1.50	2.68			
Freeport.........	1.20	2.38			
Miller Vein.......	1.30	2.48			

* F. o. b., outside Capes.

Anthracite sales have been increased by cooler weather, and arrivals have been rather slow due to lack of cars.

HAMPTON ROADS

Movement foreign and coastwise light. Government takings small. Demand from Italy shows a big decline.

Shipments from Hampton Roads have been anything but satisfactory. The movement both coastwise and foreign has been light and the government takings were small. The largest cargo of the week was taken care of by the Panama Collier "Achilles" and went to Cristobal. The demand from Italy seems to have dropped off completely and due to the submarines in the Mediterranean and the high freight rates. Most of the coastwise movement has been to Boston and Providence. There have been few government ships in port; government takings have been light especially as regards barge loading.

Railroad Tonnages—Dumpings over the local piers for the past five weeks compare as follows:

Railroad	Week Ending Oct. 30	Nov. 6	Nov. 13	Nov. 20	Nov. 27
Norfolk & Western....	126,145	120,590	133,329	100,598	118,065
Chesapeake & Ohio....	74 028	78,210	70,282	67,209	93,924
Virginian............	78,237	46,952	72,888	39,485	54,591
Totals............	278,410	245,752	276,499	207,292	266,580

Ocean Charters, Clearances and Freights

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	To	Tons	Rate
New Orleans	Cienfuegos	1,017	
Eurasia	Italy[1]	1,742	
G. E. Warren	Cienfuegos	3,700	3.50
E. F. Bartram	Buenos Aires	1,600	9.00
Thelma	Cienfuegos	846	3.50
T. Menier	La Romana	794	
R. McCurdy	Surinam	602	5.15

[1] West Coast

BALTIMORE

Vessel	To	Tons	Rate
Waltham	Cienfuegos	449	

VIRGINIA

Vessel	To	Tons	Rate
R. B. White	Cardenas	412	3.10
E. Sewell	Buenos Aires	2,125	8.00
Snowden	Buenos Aires		9.00
S. Palmer	Rio Janeiro	2,357	8.25
E. B. Winslow	Rio Janeiro	2,482	
R. E. Merrill	Rio Janeiro	2,309	
J. E. du Bignon	Puerto Cabello	468	5.00

VESSEL CLEARANCES

The following steamers have cleared from various ports during the week ended Nov. 27:

NORFOLK

Vessel	Destination	Tons
B. Palmer[2]	Argentine	3,802
Achilles[3]	Cristobal	12,032
Selene[4]	Genoa	4,985
F. Barrett[5]	San Juan	2,705
Constantinos[6]	Rio de Janeiro	6,005
Baxter, Jr.[7]	Para	4,000
Josey[8]	Havana	3,159

NEWPORT NEWS

Vessel	Destination	Tons
Berwindmoor[1]	Havana	8,087
Chiswick[1]	Trinidad	4,580
Tancred[8]	St. Lucia	5,498

PHILADELPHIA

Vessel	Destination	Tons
Andreta	Mediterranean	
J. J. Cuneo	Cuba	
Ashland[10]	Lynn	
Mingo[10]	Boston	
Merriam[10]	Boston	
Franklin[10]	Bangor	
Paxtang[10]	Bangor	
Macungie[10]	Bangor	
Ocland	Fort de France	1,874
Rio Presto	Santos	
Lincoln[10]	Portland	
Marion[10]	Bangor	
Bathayres[10]	Bangor	
Ulrik	Santiago	
Wellington	Havana	
Reading	Boston	
F. Pritchard	Boston	
Geo. E. Warren	Bangor	
Ephrata[10]	Boston	

PHILADELPHIA—Continued

Vessel	To	Tons
Leesport[10]	Lynn	
Tohickon[10]	Milton	
Lovland[1]	Cienfuegos	
Preston[10]	Brewer	
Yardley[10]	Bangor	
Rutherford[10]	Bangor	
Kohinoor[10]	Brockline	
Indian Ridge[10]	East Boston	
Comru[10]	East Boston	
Temple[10]	Portland	
Eagle Hill[10]	Portland	
Spring[10]	Portland	

BALTIMORE

Vessel	To	Tons
Sangstead	Honduras	411
Waltham	Cuba	724

NEW YORK

To	Tons
Canada	1,032
Venezuela	13
Canada	7,529
New Foundland	2,260
Trinidad	30
Santo Domingo	831
Spain	2
Canada	1,534
Chile	143
Mexico	143
Argentine	349
Canada	23
Santo Domingo	5
British West Indies	50
Canada	14

[1] Berwind White. [6] C. G. Blake Co. [3] W. A. Atwater. [4] Flat Top Fuel Co. [5] Baker Whiteley. [6] W. Va. Coal Co. [7] Smokeless Fuel Co. [8] New River Coal Co. [9] C. & O. Coal Agency. [10] Phila. & Reading Coal and Iron Co.

OCEAN FREIGHTS

At $4.50 per quarter (which is about $18 per ton) on grain to the West Coast of Italy and Mediterranean, rates are firm and advancing. South American rates are practically the same as a week ago, while rates to the West Indies are firmer. We have chartered a few steamers for export coal since our last report, but none of these fixtures have been reported. The only way in which coal chartering can be arranged is by shippers getting orders firm in hand, so that they are in position to make positive offers, and although tonnage is more than scarce, occasionally steamers can be obtained if shippers can pay market rates. In some instances we have been obliged to charter steamers on time charter, as we could not arrange charters for shippers on a satisfactory rate basis.

We would quote freight rates on coal by steamer as follows:

To	Rate	To	Rate
Havana..............	$2.75@3.25	Bermuda..............	$3.50@ 4.00
Cardenas or Sagua......	3.00@3.50	Vera Cruz............	5.00@ 6.00
Cienfuegos............	3.25@3.75	Tampico..............	5.00@ 6.00
Port au Spain, Trinidad.	4.25@4.50	Rio..................	10.80@11.40
St. Lucia.............	4.00@4.50	Santos*	11.40@12.00
St. Thomas............	3.75@4.00	Montevideo............	**12.00**
Barbados..............	4.25@4.50	Buenos Aires or La Plata†	**12.00**
Kingston..............	3.75@4.00	Rosario...............	**13.20**
Curacao...............	**4.00**	West Coast of Italy.....	21.60
Santiago..............	3.50@4.00	Barcelona**............	19.20@20.40
Guantanamo...........	3.50@4.00	Valparaiso or Callao....	11.00@12.00
Demerara.............	6.00@7.00	Marseilles.............	20.40@21.60

* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British steamers; neutral steamers are more difficult to obtain and the rates are always higher.

W. W. Battie & Co.'s Coal Trade Freight Report.

Note—Figures in **bold face** type are only approximate.

LAKE MARKETS

PITTSBURGH

Prompt coal steady; contract coal higher. Car shortage threatening and weather unfavorable for car movement. Three-month contract at $1.22½.

The market for prompt coal has suffered no setback on account of the termination of Lake shipments, as conditions in general have improved, as to consumptive prospects, and cars have become very scarce. These influences have naturally affected the contract market for contracts up to Apr. 1, and prices on contract have stiffened very decidedly. It is the universal view in the trade that coal prices will stiffen after December, and even fancy prices would not be surprising for March. Contracts that involve the immediate commencement of shipments, so as to include December, are therefore more eagerly sought than contracts involving merely the first three months of the new year. On a contract involving 1,000 tons a day of mine-run, December to March inclusive, $1.22½ has been done, but this is regarded as below the current market, even for shipment beginning Dec. 1.

The car shortage is more pronounced and trouble is experienced at nearly all mines, but the influence has been to make the market sensitive rather than actually to advance it. Reports are that at some points the congestion is being relieved, but on the other hand the weather this week turned bad, promising more trouble for the railroads. The domestic demand may be expected to improve in the next fortnight as real winter weather is promised, against the unseasonably mild weather lately prevailing.

Slack has stiffened sharply and is not available at under about 95c. for prompt and $1 on contract to Apr. 1. We quote prompt coal as follows: Slack, 95c.; nut, $1.15; mine-run, $1.15@1.20; ¾-in., $1.25@1.35; 1¼-in., $1.35@1.45; contract to Apr. 1: Slack, $1@1.05; nut, $1.25; mine-run, $1.25@1.30; ¾-in., $1.35@1.40; 1¼-in., $1.45@1.55, per net ton at mine, Pittsburgh district.

BUFFALO

Stronger market for bituminous. Eastern demand improved greatly. Canada still buying very little. Overconfidence caused increase of coal on track. Anthracite quiet, due to warm weather.

Bituminous—There is a distinctly better feeling in the trade. Where the shipper can reach Tidewater the demand is strong and the coal moves briskly. Markets southward and on the coast continue more active than here, though the late improvement here now places this market in a strong position. At the same time the slackness in Canada will continue to affect Buffalo, though jobbers are finding a good trade in Boston and westward, practically all the way through the state.

At the same time there has been too much coal on track here of late. Certain Lake shippers have diverted coal here which they have been offering at low figures, though there has not been sufficient to affect prices. There has also been some coal here from south of Pittsburgh that pays a $1.40 rate.

Prices are somewhat stronger than a week ago, but figures are unchanged, as follows:

	Pittsburgh	Allegheny Valley	Penn Smokeless
Lump	$2.80	$2.50	$2.55
Three-quarter	2.65	2.30	.....
Mine run	2.55	2.20	2.30
Slack	2.15	1.90	2.30

Quotations are f.o.b. cars at Buffalo or the Niagara bridges and per short ton except east of Rochester or Kingston, Ont.

Conditions will be more or less disturbed now till the winter movement is established.

Anthracite—There is not much life to the market, owing to the warm weather. The shortage of chestnut is the feature of the trade; it is said to be quite as pronounced as it ever was before the price was advanced and shippers are offering stove size instead, though the substitute is not very acceptable. As the warm spell is extended, there is more fear that when winter does set in there will be a rush that cannot be met. There is much complaint on the part of independent anthracite shippers that they are not able to get box cars.

The local trade is quiet, but improves rapidly whenever the weather increases in severity. Shipments by Lake continue good, being 103,300 net tons for the week. Buffalo prices remain as follows per long ton, f.o.b. cars: $5.60 for grate, $5.85 for egg and stove, $6.10 for chestnut, $4.30 for pea, with 25c. additional for loading on board vessel.

COLUMBUS

Strength of small sizes the feature of the trade. Prices 10 to 15c. higher and in some cases even more. Domestic demand better.

The trade has been fairly active, especially the steam sizes, which are stronger all along the line. Domestic demand is also better, due to lower temperatures. The tone of the market has been good and future prospects are bright.

Manufacturing is growing more active, and fuel requisitions are correspondingly increasing. Railroads are taking a larger tonnage. Car shortage is more marked and West Virginia mines are working only 50 to 60% of the average. This should help the local market as roads in this state are better able to move coal. The holiday of last week cut into the tonnage although the production was fairly large. There is a good demand for the fancy grades and there is a disposition among retailers to stock up in anticipation of a rush.

The Lake trade is about over although a few cargoes are still to be loaded. On the whole the Lake season was not as active as in some former seasons the Sunday Creek Coal Co. having shipped no Lake coal at all though other Ohio operators shipped a fair tonnage. The Hocking Valley docks at Toledo have loaded 2,543,000 tons since the opening of navigation.

Anthracite demand is increasing as the winter approaches.

Prices in Ohio fields f.o.b. mines, per short ton, are as follows:

	Hocking	Pomeroy	Eastern Ohio	Kanawha
Re-screened lump	$1.60	$1.65	.....	.....
Inch and a quarter	1.50	1.50	$1.35	$1.50
Three-quarter-inch	1.35	1.40	.....	1.35
Nut	1.25	1.30	.....	1.25
Mine-run	1.15	1.20	1.05	1.10
Nut, pea and slack	.80	.85	.75	.70
Coarse slack	.70	.75	.65	.60

Mines have been working at about the following percentages of full capacity:

	Week Ended					Week Ended			
District	Nov. 6	Nov. 13	Nov. 20	Nov. 27	District	Nov. 6	Nov. 13	Nov. 20	Nov. 27
Hocking	60	50	60	50	Cambridge	70	70	75	70
Jackson	45	40	45	40	Massillon	70	70	75	60
Pomeroy	85	85	85	80	Eastern O.	80	75	80	75
Crooksville	65	65	65	60	Average	68	65	69	62*

*Decline due to Thanksgiving Day holiday.

TOLEDO

Trade optomistic. Delays in transportation the most serious difficulty. Lake season practically closed.

There is an optimistic spirit among dealers. The only difficulty is the traffic congestion and it is believed that this will be relieved. Domestic business has been greatly stimulated by the cool weather of the past several weeks. Retailers have been very busy and the wholesalers and jobbers have felt the effects of the heavier buying. Steam prices are firm at close to the list. The Lake season is practically over although there is still some little movement.

CLEVELAND

Retail business active due to colder weather and snow. Steam coal in fair demand with light receipts. Closing of the Lake market has increased supply of coarse coal.

The fine-coal market is fairly well cleaned up with prices firm. Receipts are not very heavy as contract business is good. The shortage of cars is reducing arrivals, and Lake coal mining is practically over although loading of storage coal may follow.

Coarse coals are not moving well and domestic sizes of some grades, particularly Pocahontas, are none too strong at quotations. Jobbers have bought Pocahontas lump and egg at $1.90, mines, although the usual run of prices is 5c. higher.

Quotations are as follows to jobbers f.o.b. Cleveland per short ton:

	Pocahontas	Youghiogheny	Bergholz	Wainwright	No. 8
Freight	$1.45	$1.00	$0.70	$0.70	$0.90
Lump	3.40@3.45	.....	.....	....	.....
Lump, 6 in	....	.....	2.30	....	.....
Lump, 1¼ in	....	2.30	2.10	2.25	2.05
Lump, ¾ in	....	2.20	2.00	2.00@2.10	1.90
Lump, 3 in	....	.....	.....	2.40	.....
Egg	3.40@3.45	.....	.....	....	.....
Mine run	2.70	2.10	1.90	1.90	1.80
Slack	....	1.95	1.80	1.80	1.80

DETROIT

Demand for steam coal well sustained. Domestic grades softer due to warmer weather. Grand Trunk embargo reduces anthracite supply. Lake trade nearly over.

Bituminous—Steam coal users show little disposition to build up reserve stocks though buying continues to improve in spite of the fact that orders are for moderate tonnage. There is every indication of a steady consumption, which it is believed will continue. The demand for small sizes is still the most active. Higher temperatures have restricted the sale of domestic coal but the market is rather active and shippers are anticipating larger orders soon. There is not much consignment coal on tracks and forced sales infrequent. Car shortage in sections is causing delays in delivery.

More serious, however, is the embargo which the Grand Trunk has renewed for another week. This has shut off hard coal shipments over the company's tracks and has also cut off the movement of soft coal from Toledo. It is reported that about 900 carloads of coal are held up outside of Detroit, while other roads serving Detroit are forced to give track storage to 500 or more carloads of freight, including coal, the consignees of which are on Grand Trunk tracks. While no actual shortage is so far reported, many of the yards served by the Grand Trunk are said to be running very low on stock. It is feared the embargo may be continued indefinitely.

Lake Trade—Lake shippers are finding it increasingly difficult to charter vessels, particularly for ports on Lake Michigan. Rates on grain and iron ore are maintained at a figure which stimulates effort at speed in getting ships back to loading ports, while delays due to storms have made quick dispatch more imperative, leaving few vessels obtainable for coal.

CINCINNATI

Lack of sustained cold weather creates a general sluggishness though prices are firm, due to the car shortage.

There has not been any really cold weather, so that the demand for the prepared grades is still abnormally low. Dealers' stocks have apparently not been sufficiently reduced to force them into the market to any extent. With a relatively light industrial demand as well, the market would be in a bad position were it not for the pronounced shortage of cars. Only severe winter weather for a somewhat protracted period will stimulate any general activity.

LOUISVILLE

Domestic grades weak but steam sizes are strong.

The Kentucky market is weak and long on domestic, though there are short stocks in the retailers hands. The steam-coal market is strong, with demand really ahead of the supply, which accounts for the over-production of the domestic grades. There are prospects for a flurry of some proportions in the screenings market.

Quotations in the Eastern field range all the way up to $2.40 for fancy block, although it is said that sales are below the quoted price in some instances. In western Kentucky the bulk of the lump is going at $1.25 or thereabouts. Sales in the Eastern field have been made during the week, long ton basis, f.o.b. mines, at from $1.60 to $2, and in special cases upward, on block and from $1.10 to $1.40 for egg.

BIRMINGHAM

The past week has shown very little change in the coal market, either on steam or lump coal. Steam coal is in slightly better demand, owing to the railroads taking larger tonnages on their contracts, in anticipation of a possible car shortage during the winter months. On the whole, the market is satisfactory on both grades and the prospects are encouraging for a steady business during the next sixty days.

COKE

CONNELLSVILLE

Market not well defined, demand being light Foundry coke demand fair, with stiff prices compared with furnace grade. Production and shipments slightly increased.

The coke market is not very clearly defined. Prices lately going for prompt furnace coke have not been such as to attract operators, and it is possible they have been accumulating a little surplus against the fancy prices so generally predicted for holiday time. There is scarcely any demand for prompt coke so that the market is not thoroughly tested. Practically all the furnace coke contracting has now been done, and there are only occasional inquiries for all or any part of next year. As consumers have had to pay considerably higher prices on contracts for shipment after Jan. 1 than they are paying on current contracts, to expire Dec. 31, they have naturally been insisting on heavy shipments, and the end of the year may find them with fair supplies in yard or on track, a condition that would militate against any sharp advance on prompt coke.

Foundry coke continues in fair demand for prompt lots, and as high as $3.25 is still obtained by a few operators who furnish particularly good coke and can make instant shipment, but there is other foundry coke of good grade available for considerably less. Not much activity has developed as to contracts for the first half of next year. Many consumers, perhaps the majority, have twelve-month contracts, running to July 1. We quote: Prompt furnace, $2.15@2.25; contract furnace, first half, $2.35@2.50; year 1916, $2.25@2.35; prompt and contract foundry, $2.90@3.25, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Nov. 20 at 433,402 tons, an increase of 6,021 tons, and shipments at 435,337 tons, an increase of 4,834 tons.

Baltimore—The movement of coke has been erratic. Following a decided upward trend of two weeks since, when best Connellsville touched $3.50, and West Virginia $3, there was a reaction. Prices quoted to the trade here are about as follows: Low sulphur 72-hr. Connellsville, from $2.75 to $3; same, West Virginia, $2.50; 48-hr. Connelsville, $2.25 to $2.50; same, West Virginia, $2 to $2.25.

Buffalo—The market is strong at former quotations, which are on the basis of $4.85 to $5 for 72-hr. Connellsville foundry. This market is not so active as it is in the producing districts, but is gaining. There is a scarcity of men, both at the ovens and in factories, which makes deliveries slow.

Chicago—The coke market is brisk with the supply short. Connellsville commands $5.75, and byproduct foundry has shown an advance of 25c. per ton. Gas house coke is stronger. Prices per net ton, f.o.b. cars Chicago, are as follows: Byproduct, foundry, $5.50@5.75; byproduct, domestic, $4.95@5; Connellsville, $5.50@5.75; Wise County, $5.25@5.50; gas coke, $4@4.25.

MIDDLE WESTERN

GENERAL REVIEW

Domestic demand fairly active. Steam coals booming. Screenings score further advances. Eastern grades still variable.

The situation in the Western coal markets is very encouraging. Railroads are storing more coal and trade is expanding everywhere with a broader distribution of shipments. Orders for all grades and sizes are now arriving in steady volume. Lower temperatures earlier in the week caused a spurt of orders by wire from many retailers with light stocks, who urged prompt shipment. Country absorption has been more extensive, and it is obvious that many retailers do not hold normal stocks for this time of year.

Shortages of cars and labor still persist. No consignment coal of any consequence is on hand at Western points. Industrial conditions have greatly improved, with steam demand advancing steadily. Screenings and slack maintain their strong position, and show tendencies toward further stiffening. Steam lump is asked for in larger quantities, and prices show greater firmness. Coarse sizes at Indiana and Illinois mines have been moved as fast as produced this week.

CHICAGO

Illinois and Indiana domestic sizes strong. Smokeless coals easy. Hocking grades holding strictly at circular.

Hand-to-mouth buying prevails to a large extent among the public, with constant re-ordering in small quantities, and the result is that many yards have found sales substantially less than previous years.

Franklin and Williamson County coals are moving in fair volume. Prices are rigidly maintained, and the mines are averaging four to five days per week. Screenings from southern Illinois mines are averaging around 70 to 75c. Saline County domestic sizes are moving at $1.75.

Railroad orders to the mines in Central Illinois have been increased, and some of the coal shipped is undoubtedly going into storage. The domestic sizes are firm at $1.75 and screenings are moving steadily at around 70 cents.

The recent cold snap brought an influx of orders for Indiana domestic coals by wire, confirming the opinion that storage supplies of retailers were below normal. An advance in price is scheduled for next week, perhaps 25c. per ton for domestic lump. Steam coals are strong, and such surplus tonnage as is not covered by contracts will undoubtedly yield higher prices in December.

Pocahontas lump has been soft but mine-run has held firm at $1.40; egg is easy around $1.65. It is felt that as the winter develops the situation in smokeless coals will grow stronger. No surplus splint coal has been available for sale in this market. Box car splint lump shipments are being sold readily at $1.60 for direct forwarding from the mines. Pennsylvania smokeless lump, egg and mine-run are still in a strong position due to car shortages.

Hocking domestic lump is firm at from $1.65 to $1.75, and tonnage reaching this market about equals demand. The Hocking steam trade shows improvement, and fine coals are absorbed as fast as produced.

Car supply at Kentucky mines has improved. Some Eastern Kentucky domestic lump has been advanced to $2.40, while second grades have sold as low as $1.90. Mine-run is somewhat weaker.

Orders for anthracite from Northern Indiana have been increasing. In Western states like Iowa, Nebraska, Kansas and Missouri the stocking requirements for this year seem to be satisfied, although colder weather may cause some orders to appear. There is an increased rail movement of anthracite to Northwestern points. Chestnut is in good demand, and egg has been slow.

Quotations in the Chicago market per net ton, f.o.b. cars at mines are as follows:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump......	$1.65@1.75	$1.60@1.75	$1.50@1.65	$1.50@1.65	$1.50@1.65
Steam lump	..	1.25@1.35	1.20@1.30	1.15@1.30	1.25
2½ and 3-in. lump....	....	....	1.35@1.50	....	1.35
1¼-in. lump.	....	....	1.25@1.35	1.20@1.30	1.25
Egg	1.65@1.75	1.50@1.65	1.15@1.35	1.20@1.45	1.15@1.35
Nut ..	1.60@1.75	1.50@1.60	1.00@1.15	1.05@1.20	1.05@1.20
No.1washed	1.65@1.75	....	1.50	....	....
No.2washed	1.40@1.50	....	1.40	....	....
No. 1 nut ..	1.65@1.75	....	....	....	....
No. 2 nut ..	1.50@1.60		....	....	....
Mine-run...	1.15	1.05@1.10	.85@ .95	.90@1.10	.90@1.10
Screenings..	65@ .75	.65@ .75	.65@ .75	.70@ .80	.75@ .80

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump......	$1.60@1.75	$1.60@2.25	$1.65@2.00	$2.25	$1.65@1.75
1¼-in. lump.	1.30@1.40	1.15@1.30	....	1.50@1.75	1.50
Egg	1.60@1.75	1.45@2.00	1.65@2.00	1.90@2.25	1.15@1.30
Nut.......	1.60	1.35@1.55	....	....	....
No. 1 nut..	1.65@1.75	....	....	....	....
No. 2 nut..	1.50@1.60	....	....	....	....
Mine-run...	1.10@1.15	1.15@1.25	1.40	1.40	1.15@1.25
Screenings..	.70@ .75	65@ .75	....	....	.75

Kanawha splint Lump, $1.60.

INDIANAPOLIS

Large mines now well sold ahead. Prices not generally higher, but are quite firm. Storing against possible shut-down in the spring.

There is now no doubt of a well-established improvement in the Indiana coal trade. The largest operators report their mines sold up for thirty days and that they anticipate a busy winter. They are able to place more coal as the season advances. Railroads and factories are stocking, as well as buying freely to cover current needs. There is general industrial activity and steel plants, particularly, are going full time. Prices of screenings have advanced and nothing is being offered under 80c. f.o.b. mines, with No. 4 commanding 90c. Other grades have sympathetically stiffened, domestic lump selling at $1.60 to $1.65 f.o.b. mines. No. 4 mine-run is offered at $1.15 to $1.20, f.o.b. mines, and Nos. 5 and 6 at $1.05.

ST. LOUIS

Mild weather causes a slowing up in domestic grades and the market has been maintained with difficulty.

Continued fine weather has caused a moderate slump in the lump grades during the past week. Demoralization in prices has been averted by the operators holding their output on track in the belief that cold weather cannot be far off. Stagnation in lump has sent the finer grades up some.

Quotations f.o.b. mines during the past week have ranged on the following basis per short ton:

	Frnk. Co.	Wlmson. Co.	Staunton	Standard
6-in. lump.............	$1.50@1.65	$1.50@1.65	$1.25	$0.90@1.10
8-in. lump.............	....	....	....	1.15
2-in. lump.............	....	....	1.15	1.00@1.10
3x6 egg................	1.40@1.65	1.40@1.65	....	1.00@1.15
2x6 egg................	....	....	....	.80@.85
No. 1 nut..............	1.50@1.75	1.50@1.75	....	.80
No. 2 nut..............	1.25@1.50	1.25@1.50	....	.70
No. 1 washed...........	....	1.40@1.50	1.40@1.50	....
No 2 washed............	....	1.25@1.40	1.25@1.40	....
No. 3 washed...........	....	1.15@1.25	1.15@1.25	....
No. 4 washed...........	....	1.15@1.25	1.15@1.25	....
No. 5 washed...........	....	.75@.85	.75@.85	....
Screenings.............	.65@.70	.65@.70	.50	.40@.50

Freight Rates—Inner group, St. Louis, 57½c., East St. Louis 37½c. Outer group, St. Louis, 72½c., East St. Louis, 52½c.

DULUTH

Season of navigation soon to close. Receipts are heavy. Shipments are brisk.

Coal receipts during the past week have been quite heavy. Dock companies are rushing coal cargoes forward in anticipation of the close of navigation, which is likely to occur at any time. Heavy storms on the eastern end of Lake Superior delayed the arrival of many vessels last week, and hence there is considerable bunching of cargoes this week, no less than 19 vessels having arrived in one day.

Shipments have been well maintained, freezing weather and the appearance of snow having induced many retailers and the householders to stock up. The demand from the railways and steam users has been quite brisk and conditions generally for the past week have been very satisfactory. Prices per short ton f.o.b. docks are as follows:

	Yough	Splint	Hock	Smokeless	Elkhorn
Lump...........	$3.40	$3.40	$3.40	$4.75	$3.75
Dock run........	3.10	3.10	3.10	3.25	3.25
Stove or nut.....	3.40	3.40	3.40	4.75	3.65
Screenings.......	2.40	2.40	2.25	2.75	2.40

Conditions have been quite favorable during the past week and there has been a heavy movement of anthracite coal. The weather has been cold and the first appearance of winter shook out a large number of orders for immediate shipment. Prices per short ton f.o.b. docks are as follows: Nut, $7.10; egg and stove, $6.85; pea, $5.55 and buckwheat, $4.

PRODUCTION AND TRANSPORTATION STATISTICS

BALTIMORE & OHIO

The following is a statement of coal and coke tonnage moved over this system and affiliated lines during October and the previous two months:

	August		September		October	
	1915	1914	1915	1914	1915	1914
Coal.......	3,009,028	2,769,453	3,034,271	2,878,963	3,124,328	2,662,377
Coke.......	345,258	242,283	331,224	237,661	368,257	208,866
Total....	3,354,286	3,011,736	3,365,495	3,116,624	3,492,585	2,871,243

IMPORTS AND EXPORTS

The following is a comparative statement of coal and coke imports and exports of the United States for August, 1914-15, and for the eight months ending August, 1913-14-15, in long tons:

	August		Eight Months Ending August		
	1914	1915	1913	1914	1915
Anthracite (total).......	....	77	30	15,902	2,390
Bituminous (total)......	103,469	116,295	919,418	861,513	951,517
Imported from—					
United Kingdom....	50	200	3,693	8,308	15,610
Canada............	80,608	84,770	746,029	669,512	758,634
Japan..............	13,466	10,540	70,229	44,449	56,919
Australia...........	9,173	20,785	96,651	137,191	117,778
Other countries.....	172	....	2,816	2,053	2,576
Coke (total)............	5,288	9,231	46,802	67,003	33,620
Anthracite (total).......	455,305	307,147	2,847,443	2,666,969	2,304,964
Exported to—					
Canada............	452,538	293,318	2,800,112	2,627,945	2,261,722
Argentina..........	....	1,740	....	....	2,335
Brazil..............	....	2,372	....	....	2,415
Uruguay...........	....	600	....	....	605
Other countries.....	2,767	9,117	47,331	39,024	37,887
Bituminous (total)......	1,955,176	2,000,848	11,834,511	9,045,260	10,588,583
Exported to—					
Italy...............	....	382,154	....	....	2,023,945
Canada............	1,513,096	947,069	8,652,472	6,038,926	4,737,655
Panama............	22,067	49,423	351,850	190,965	329,450
Mexico.............	24,705	18,507	377,098	215,068	216,246
Cuba..............	79,537	114,299	868,114	696,111	734,536
Other West Indies...	60,550	42,347	419,496	415,824	308,605
Argentina..........	25,811	128,823	48,626	138,219	662,714
Brazil..............	54,695	53,002	200,088	155,225	482,971
Uruguay...........	10,920	30,956	5,163	56,514	130,790
Other countries.....	163,795	234,268	911,604	1,138,408	961,671
Total coal..........	2,410,481	2,307,995	14,681,954	11,712,229	12,893,547
Coke.................	48,220	83,085	607,767	456,661	513,679
Bunker coal............	512,700	672,990	5,079,189	5,038,576	5,027,027

FOREIGN MARKETS

GREAT BRITAIN

Nov. 19—There is no change in the general situation. Business is still restricted by lack of tonnage and stocks continue excessive. Quotations are approximately as follows:

Best Welsh steam.......	Nominal	Best Monmouthshires. ..	$4.32
Best seconds............	Nominal	Seconds................	4.20
Seconds.................	$4.32	Best Cardiff smalls......	2.64
Best dry coals..........	5.64	Cargo smalls...........	1.68

The prices for Cardiff coals are f.o.b. Cardiff, Penarth, or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—Rates have further advanced for the Mediterranean and the tendency is still upward. Rates are approximately as follows:

Gibraltar.........	$7.08	Naples..........	$11.88	St. Vincent......	$7.80
Marseilles........	10.83	Alexandria......	12.24	River Plate......	9.00
Algiers...........	9.65	Port Said.......	12.24		
Genoa............	11.88	Las Palmas.....	7.20		

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

✚Indicates contracts regarding which official information has been received.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

1401—New Orleans, La.—Purchases on this contract (p. 447), which provide for furnishing the Robert Werk Pressing Cloth Co. with its annual requirements of coal, involving approximately 300 tons of lump or mine-run, will be confined to the open market because of the unsettled conditions in the coal trade. Address Pres. Robert Werk, Robert Werk Pressing Cloth Co., 2519 St. Phillip St., New Orleans, La.

1451—New Orleans, La.—This contract (p. 530), which provides for furnishing the fuel requirements for the Algiers Distilling Co., will not be negotiated until about the middle of January. Address Purchasing Agent, The Algiers Distilling Co., Brooklyn Ave. and Mississippi Levee, Algiers, La.

✚1598—New Orleans, La.—Bids will be received on this contract (p. 736), until 11 a.m., Dec. 7. The contract provides for furnishing the Public Belt Co. with its annual requirements of coal, involving approximately 8,000 tons of either mine-run, washed nut, slack or washed slack. The bids should be made on the basis of short tons, f.o.b. New Orleans at some point on the Public Belt tracks. All bidders will be required to furnish the Purchasing Committee carload samples to be paid for by the Commission for the purpose of testing. Address Secy. Frank H. Joubert, 6th floor, Municipal Bldg., New Orleans, La.

1635—Denver, Colo.—This contract (p. 870), which provides for furnishing the Post Office at this place with approximately 600 tons of good grade of bituminous lump coal over a 2 in. screen, was bid on as follows, per long ton: Colorado & Utah Coal Co., $4.50; Moffat Coal Co., $4.76; the Great Northern Fuel Co., $4.84; William E. Russell, $4.84; The Colorado Fuel and Iron Co., $4.92; The National Fuel Co., $4.98; The Rocky Mountain Fuel Co., $5.07. Address Custodian B. F. Stapleton, U. S. P. O., Denver, Colo.

1648—Jersey City, N. J.—No bids were received on this contract (p. 871), which provides for furnishing the county institutions with coal. Address Clk. Walter O'Mara, Bd. of Chosen Freeholders, Hudson County, Jersey City, N. J.

New Business

Volume and page number in parenthesis at the end of an item indicate where the previous announcement, bids and awards on that contract may be found.

1685—Cincinnati, Ohio—The Union Central Life Insurance Co. of this place require about 5,000 tons of nut and slack coal, and 200 tons of smokeless coal per annum. Deliveries are made by wagon at the rate of 13 to 15 tons per day. They have a storage capacity of 400 tons, and the next contract will be made Jan. 1. Address Pur. Agt. W. W. McIntyre, Union Central Life Ins. Co., 4 Pine St., Cincinnati, Ohio.

1686—Alton, Ill.—The Alton Steel Hoop Co. at this place has requested bids to cover their fuel requirements during the year beginning Jan. 1. From 250 to 300 tons per week of 1½-in. screenings will be required, and 150 to 250 tons of 3x2-in. or 4x2-in. gas producer coal. The consumption will be dependent on whether the mill is operated single or double turn. Address Secy. M. L. Mozier, The Alton Steel Hoop Co., Alton, Ill.

✚1687—Millvale, Penn.—The local electric light plant at this place usually contracts for their annual fuel requirements involving approximately 30,600 tons of 1¼-in. lump about Jan. 1. The business is let on competitive bids and the approximate price is $2.25 per ton. Address City Clk., Millvale, Penn.

1688—San Antonio, Tex.—The St. Anthony Hotel at this place usually contracts for its annual fuel requirements involving about 40 tons of lignite per month on the first of the year. Address Chf. Engr. Orr, St. Anthony Hotel, San Antonio, Tex.

1689—St. Louis, Mo.—The Standard Stamping Co. at this place is receiving bids for their annual fuel requirements involving four or five cars of lump or egg coal per month. Address Pur. Agt. Porter Wiegand, Standard Stamping Co., St. Louis, Mo.

1690—Bangor, Penn.—The S. Flory Manufacturing Co. usually contracts for their annual fuel supply semi-annually, in January and July. They require about 1,900 tons of bituminous coal and deliveries are made by railroad at the rate of four cars per month. In addition to this they require about three cars of smithing coal per annum, though this is not bought on a contract. The company has storage capacity for 100 tons. Address Pur. Agt. E. G. Markley, The S. Flory Manufacturing Co., Market St., Bangor, Penn.

1691—St. Louis, Mo.—The American Paper Products Co. is in the market for their annual requirements of coal involving approximately 200 tons of Carterville 1½-in. screenings per month. Bids are also being received for furnishing the Carthage, Indiana plant of the company with approximately 1,000 tons per month. Address Pur. Agt. Pollock, American Paper Products Co., St. Louis, Mo.

1692—Battle Creek, Mich.—The Advance Pump and Compressor Co. at this place usually contracts for their annual fuel requirements, involving approximately 400 tons of West Virginia egg coal on Jan. 1. Deliveries are make by railroad at the rate of one car per month, and the company has a storage capacity of 150 tons. Address Purchasing Agent, Advance Pump and Compressor Co., Battle Creek, Mich.

1693—Philadelphia, Penn.—The Industrial Cold Storage and Warehouse Co. at this place contracts for their annual fuel requirements involving approximately 6,000 tons of gas slack on Jan. 1. Deliveries are made by railroad at the rate of 120 tons per week. The company has storage capacity for 360 tons. Address General Manager, Industrial Storage and Warehouse Co., American and Berks St., Philadelphia, Penn.

1694—Philadelphia, Penn.—The Thomas Devlin Manufacturing Co. at this place usually contract for their annual fuel requirements about Jan. 1. The tonnages involved are: Anthracite broken, 3,300; Lykens Valley pea, 1,000; bituminous gas, 4,000; steam, 1,500; 72-hr. coke, 900. Deliveries are made by railroad as required. Address Pur. Agt. H. Drinkhouse, Thomas Devlin Manufacturing Co., 3rd and Lexington Ave., Philadelphia, Penn.

✚1695—Peoria, Ill.—The Elsberry, Missouri, Drainage District is in the market for approximately 1,200 tons of 1½-in. screened lump. About 500 tons will be required soon, and the balance later. Bids will be received until 10 a.m., Dec. 6, and the coal will be bought on a heat unit basis. Address Harman Engineering Co., 144 Fredonia Ave., Peoria, Ill.

✚1696—Elmira, N. Y.—The Water Board will receive bids until 5 p.m., Dec. 14, for furnishing approximately 2,000 tons of bituminous mine-run coal during the year 1916. Smokeless coal is required, and it must not contain more than 25.99% volatile matter. The board contemplates its purchase on a heat unit basis, and an analysis of the coal must accompany each bid, which analysis will be used as the basis for computing the heat value. Address Gen. Mgr. H. M. Beardsley, Water Board, Elmira, N. Y.

1697—St. Louis, Mo.—The Independent Breweries is in the market for coal required at its different plants as follows: American Brewery, 300 to 600 tons of 1¼-in. screening per month; National Brewery, 300 to 600 tons of either Nos. 2, 3, 4 or 5, or mixtures of washed sizes; Columbia Brewery, 500 tons per month of 1½-in. screenings; Empire Brewery, 500 to 600 tons per month of 1½-in. screenings, or Nos. 2, 3, 4, 5 washed or mixed washed sizes; Central Brewery, 500 to 600 tons per month of 2-in. lump, and either Nos. 3, 4, 5 washed or mixed washed sizes; Gast Brewery, 400 tons per month of 2-in. lump, and either Nos. 3, 4 or 5 washed or mixed sizes; Wagner Brewery, 350 tons per month of 1½-in. screenings, and either Nos. 2, 3, 4 or 5 washed or mixed washed sizes.

National, Central, Empire and Wagner Breweries require carload deliveries, and the balance wagon deliveries. Address Pur. Agt., Carl Krausnick, The Independent Breweries, St. Louis, Mo.

1698—Milwaukee, Wis.—When the new city budget goes into effect Jan. 1 the Department of Public Works will advertise for new contracts for furnishing the Menomonee Special Sewerage Pumping Station with approximately 2,000 tons of Pocahontas and mine-run coal. The last previous contract was held by the Milwaukee Western Fuel Co. and at the present time the coal is bought in the open market. Address Chief Clk. Wm. H. Schacht, Jr., Dept. of Public Works, Milwaukee, Wis. (Vol. 7, p. 189.)

+1699—Columbus Grove, Ohio—The Board of Public Works at this place is testing out West Virginia mine-run coal with a view to entering into a contract shortly. They require about one car per week and delivery is made by C. H. & D. R.R. Address Clerk, Board of Public Works, Columbus, Ohio.

1700—Denver, Colo.—The Colorado Packing and Provision Co. at this place consume about 40 tons of coal per day, for which they contract some time in January. Address Purchasing Agent, Colorado Packing and Provision Co., Denver, Colo.

1701—Camden, N. J.—The New York Shipbuilding Co. is in the market for approximately 1,200 tons white ash broken coal, deliveries to be made during 1916. Address Pur. Agt. Leon G. Buckwalter, New York Shipbuilding Co., Camden, N. J.

+1702—Bluffton, Ohio—The Board of Public Affairs at this place is testing out various grades of West Virginia and Ohio coal, preparatory to placing a contract covering their requirements. Address Purchasing Agent, Board of Public Affairs, Bluffton, Ohio.

1703—Miles City, Mont.—Bids were received until Dec. 1 for furnishing coal required at the Carnegie Library during the ensuing year. Deliveries are to be made as required and bidders should specify the grade of coal they propose furnishing and the price. Address Sec. Ida W. Fearnall, Bd. of Trustees, Miles City, Mont.

1704—Norristown, Penn.—Counties Gas and Electric Co. will be in the market about Jan. 1 for their annual supply of broken coal, estimated at from 5,000 to 6,000 tons. Address Pur. Agt. J. A. Pearson, Broad and Arch St., Philadelphia, Penn.

1705—Colorado Springs, Colo.—The Dourte-Hessell Manufacturing Co. at this place will contract about Jan. 1 for their annual fuel requirements, involving approximately 500 tons of slack coal, deliveries to be made at the rate of about 40 tons per month. Address Pur. Agt. W. W. Hassell, Dourte-Hassell Manufacturing Co., Colorado Springs, Colo.

1706—Columbus, Ohio—The John Wildi Evaporated Milk Co. at this place is in the market for approximately 2,500 tons of smokeless or semi-smokeless mine-run coal, for their Bainbridge, N. Y., plant, 2,000 tons for use at Lewisburg, Penn., and 2,300 tons for use at their Troy, Penn., plant. Complete details and specifications may be had on application. Address General Superintendent, John Wildi Evaporated Milk Co., Columbus, Ohio.

1707—Jefferson, Wis.—The Board of Education at this place will receive bids until Dec. 6 for furnishing approximately 150 tons of West Virginia splint, dock screened coal, to be delivered as required at the High School and Public Library. Address Chn. S. E. Waterbury, Bd. of Edu., Jefferson, Wis.

1708—Clearfield, Penn.—The City Council received bids until 7 p.m., Dec. 1, for furnishing coal as may be required for the hose houses in the Second, Third and Fourth wards. Address Sec. J. D. Connelly, City Council, Clearfield, Penn.

1709—Denver, Colo.—The Three Forks Portland Cement Co. are in the market for one carload of Pennsylvania blacksmith coal. Quotations should be made f.o.b. Trident, Mont. Address Sec. and Gen. Mgr. R. J. Morse, 508 Ideal Bldg., Denver, Colo.

1710—Cleveland, Ohio—T. P. Jones, fuel agent at this place, is in the market for 200 cars of West Virginia slack, or nut and slack coal, deliveries to be made at the rate of two cars per day beginning immediately. Address T. P. Jones, Fuel Agt., Cleveland, Ohio.

1711—Cumberland, Md.—The Allegheny County Commissioners will receive bids until noon, Dec. 7, for furnishing and delivering coal as may be required during the ensuing year in the bins of the court house and jail, and in carload lots on Payne Spring siding for the Insane Asylum and County Home. Bidders must specify what mine they propose furnishing the coal from. Address Clk. Angus Ireland, Allegheny County, Cumberland, Md.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

+1439—Muscatine, Iowa—This contract (p. 490), which provides for furnishing and Muscatine-Louisa Drainage District, No. 13, with approximately 200 tons of soft lump coal, has been awarded to **W. G. Block & Co.** Four bids were submitted. Address Audr. H. C. Shoemaker, Muscatine, Iowa.

+1442—Crookston, Minn.—This contract (p. 490), which provides for furnishing the Polk County Court House with 160 tons of Hocking Valley mine-run coal, was awarded to **S. W. Vance & Co.**, of Crookston, at $6 per ton. Deliveries to be made as required and to be concluded before next spring. Address Audr. H. J. Welte, Polk County, Crookston, Minn.

1446—Mauch Chunk, Penn.—This contract (p. 490), which provides for furnishing the Borough School Board with coal has been awarded as follows: **H. A. Butler & Co.**, 60 tons of chestnut for the Asa Packer Building at $5.40 per ton; **Lehigh Coal and Navigation Co.**, 75 tons of pea for the First Ward Building, at $3.60 per ton. Address Secy. C. S. Weiler, School Bd., Mauch Chunk, Penn.

+1461—Albia, Iowa—This contract (p. 530), which provides for furnishing the several buildings of the Independent School District with coal, has been awarded to **Hammond & Moss** at $2.30 per ton for clean lump coal. A small quantity of steam coal will also be required which is now being bought in the open market at $1.50 per ton. There were four additional bids submitted on the contract for the lump coal ranging from $2.30 to $3 per ton. Address Secy. C. W. Smallwood, Independent School Dist., Albia, Iowa.

+1463—Little Falls, Minn.—This contract (pp. 530, 870), which provides for furnishing the City Government with approximately 50 tons of Youghiogheny coal, was divided equally between **W. H. Ryan** and **Julius Zetka.** Address Comr. H. J. Lafond, Little Falls, Minn.

+1469—Warren, Minn.—This contract (p. 531), which provides for furnishing the Marshall County Court House with approximately 125 tons of Youghiogheny screened lump coal, has been awarded to **Knutson & Holson**, at $5.62 per ton, delivered. Address Audr. A. G. Lundgrem, Warren, Minn.

+1478—Jamesburg, N. J.—This contract (p. 531), which provides for furnishing the New Jersey State Home for Boys with approximately 3,500 tons of buckwheat and 100 tons of stove coal, has been awarded to **Miles Ross & Sons.** Address Supt. Richard J. Drever, New Jersey State Home for Boys, Jamesburg, N. J.

+1490—Leetonia, Ohio—This contract (p. 576), which provides for furnishing the local water works with coal required during the ensuing year has been reawarded to **F. J. Neiheisel** at $2 for lump, $1.80 for mine-run and $1.10 for slack. This contractor has had this business for several years. Only one other bid was received on the business. Address Secy. Jacob Kuegle, Bd. of Pub. Affairs, Leetonia, Ohio.

1507—New Orleans, La.—This contract (p. 577), which provides for furnishing the fuel requirements for the Dixie Laundry Co., has been awarded to the **C. A. Andrews Coal Co.** Address Sec.-Treas. Max N. Kohler, Dixie Laundry Co., 1124 Tulane Ave., New Orleans, La.

1551—East St. Louis, Ill.—This contract (pp. 660, 828), which provides for furnishing Swift & Co. with approximately 120 tons of 1½-in. or 2-in. screenings per day, was awarded to the **Breese Trenton Mining Co.** It is understood the contract will run until Mar. 31, 1917, and that the price was 50c. per ton f.o.b. cars at the mines. Address H. C. Huggins, Swift & Co., East St. Louis, Ill.

1574—New Orleans, La.—This contract (p. 699), which provides for furnishing the International Distillery Co. with approximately 350 tons of coal, deliveries to be made during the next year, has been awarded to the **C. A. Andrews Coal Co.** Address Pur. Agt. Kern, International Distillery Co., Pine and Ferdinand St., New Orleans, La.

1576—New Orleans, La.—This contract (p. 700), which provides for furnishing the Lane Cotton Mills with approximately 50 cars of steam coal, has been closed with a New Orleans concern until next May. Address Pur. Agt. R. Lecorgne, Lane Cotton Mills, 434 Cadiz St., New Orleans, La.

1579—New Orleans, La.—The award on this contract (pp. 700, 829), which provides for furnishing the Cosmopolitan Hotel with approximately 120 tons of coal per month, was made to the **Darsam Bros. Coal Co.** Address Pur. Agt. Major Stewart, Cosmopolitan Hotel, 120 Bourbon St., New Orleans, La.

1589—St. Louis, Mo.—This contract (p. 736), which provides for furnishing the Liggett & Myers Tobacco Co. with its annual requirements of coal, involving approximately 2,000 tons of either 1½-in. screenings or No. 5 washed slack per month, has been awarded to the **Consolidated Coal Co.** The contract is to run for one year from date. Address Gen. Mgr. R. D. Lewis, Liggett & Myers Tobacco Co., St. Louis, Mo.

+1600—Warrensburg, N. Y.—This contract (p. 736), which provides for furnishing the fuel requirements for School District No. 1, during the ensuing school year, has been awarded to **A. C. Emerson & Co.,** who were the lowest bidders. Address Secy., Board of Education, Union Free School District, No. 1, Warrensburg, N. Y.

+1612—Aliquippa, Penn.—This contract (p. 786), which provides for furnishing the Village Government with approximately 500 bu. of 1¼-in. bituminous lump coal, has been awarded to **J. A. Barto** at 9⅜c. per bu. Address Secy. L. S. Patton, Municipal Bldg., Aliquippa, Penn.

+1616—Houston, Tex.—This contract (p. 786), which provides for furnishing the winter supply of coal to the Harris County institutions known as the Boys' School at South Houston and the Harris County School for Girls at Bellaire, was awarded by the Harris County Board of Commissioners on Nov. 10 to **Ed Sacks,** of Houston, on the following basis: McAlester nut coal, f.o.b. South Houston, $5.20; f.o.b. Bellaire, $6.85. Other bids submitted were: Richard Cocke & Co., f.o.b. South Houston, $9; Bellaire, $11.50; Sampson & Beardon, South Houston, $5.75; Bellaire, $8.50; Houston Wood and Coal Co., South Houston, $5.25; Bellaire, $8; Rice & Coles, South Houston, $5.30; Bellaire, $6.60; Crystal Ice and Coal Co., South Houston, $10.25; Bellaire, $10.25; Richey Wood Co., South Houston, $10.50; Bellaire, $12. Address County Audr. H. L. Washburn, Houston, Tex.

1618—St. Louis, Mo.—This contract (p. 786), which provides for furnishing the St. Louis Dressed Beef and Provision Co. plant with approximately 100 tons per day of 1½-in. screenings, has been awarded to the **Bickett Coal and Coke Co.** The contract is to run for one year. Address Pur. Agt. J. M. Weiser, 3919 Papin St., St. Louis, Mo.

1625—Marshall, Minn.—This contract (p. 828), which provides for furnishing the local city power plant with approximately 1,800 tons of coal, has been awarded to the **Marshall Milling Co.** at 75c. per ton for Franklin County 2-in. screenings f.o.b. Marshall. Address Rec. T. L. Bumford, Marshall, Minn.

1627—Belfield, N. D.—This contract (p. 828), which provides for furnishing the local Court House with coal as may be required during the ensuing year, has been awarded to **A. A. Dinsdale** at $2.90 per ton for lignite coal. Address County Audr. J. L. Hughes, Belfield, N. D.

1632—Greenville, Ohio—This contract (p. 828), which provides for furnishing the Darke County Board of Commissioners with approximately 100 tons of Pocahontas lump coal for delivery on cars, P. C. C. & St. L. sidetracks at Greenville, has been awarded to **M. A. Maher** at $3.50 per ton for 2-in. screenings. Address Clk. G. H. Garrison, Darke County Board of Comrs., Greenville, Ohio.

+1633—New York, N. Y.—This contract (pp. 828, 911), which provides for furnishing the Central Purchasing Committee with approximately 10,000 tons of anthracite and bituminous coal for various city departments, has been awarded as follows, per gross ton: Zone 1, **Bacon Coal Co.,** $3.38; Zone 7, **C. H. Reynolds & Sons,** $3.25; Zone 9, **Bacon Coal Co.,** $5.40; Zone 11, **Jamieson & Bond Co.,** $7.85; Zone 17 Class "B," **John E. Donovan,** $7.10; Zone 18, Class "B," 300 and 1,000 tons, **William Farrell & Son,** $3.99 and $2.12 respectively; Zones 1 to 17 inclusive, tonnages of 100, 75, 150, and 50, **F. M. A. Leach,** $6.85, $6.85, $7.20 and $8.10 respectively and same zones tonnage of 25 tons to **S. Haber** at $6.95. Bid on Zone 8 was rejected while bids on Zones 3 and 17, Class "A," and Zone 18, Class "A," are still under consideration, tests being made of the coal offered. Address, Central Pur. Com., Room 1126, Municipal Bldg., New York City. (No. 706, Vol. 7, p. 915).

+1637—Philadelphia, Penn.—This contract (p. 870), which provides for furnishing the Philadelphia County prison with approximately 2,000 tons of buckwheat, has been awarded to **William Bryant** on Lykens Valley buckwheat, at $3.30 per gross ton, delivered at Holmesburg Prison and $4.23 at the Reed St. Prison. This company was also awarded contract for 100 tons of white ash stove at $5.78 for delivery at Holmesburg and $6.88 at Reed St. Address Supt. Frederick A. Cooke, 10th and Reed St., Philadelphia, Penn.

+1642 Bayonne, N. J.—This contract (p. 870), which provides for furnishing approximately 200 tons of anthracite egg and stove coal to the various fire houses and police headquarters, has been awarded to **Wm. Laubenheimer,** at $5.49 per ton. Address, City Clk. Wm. P. Lee, Bd. of Comrs., Bayonne, N. J.

1644—Maryland, N. Y.—This contract (p. 870), which provides for furnishing the Union Free School District No. 2 with one carload of stove coal, has been awarded to **Platt & Howland** at $6 per ton. J. B. Murdock bid $6.25. Address Clk. R. B. Safford, Union Free School Dist. No. 2, Maryland, N. Y.

+1646—Media, Penn.—This contract (p. 870), which provides for furnishing the City Government with approximately 200 tons of Lykens Valley pea coal, has been awarded to the **Philadelphia & Reading Coal and Iron Co.** at $2.50 per gross ton at the mines. Address Clk. Ed. Minton, Media, Penn.

1684—Salt Lake City, Utah—This contract (p. 912), which provides for furnishing the Board of Education with approximately 5,000 tons of slack and 500 tons of lump and nut coal, has been awarded to the **Bamberger Coal Co.** at $2.45 for slack and to the **Parrott Coal Co.** at $4.65 for nut and $5.20 for lump coal. The prices include delivery at the schools. Most of the bids submitted on this business were at the regular circular prices of $5.25 for nut and $5.75 for lump, though a few other bids were received at somewhat less, which is distinctly contrary to the experience in former years. The slack coal will be furnished from Wyoming mines and the lump and nut from the Utah mines. There were 13 bidders altogether on the contract. Address Clk. L. P. Judd, Bd. of Edu., Room 202 City and County Bldg., Salt Lake City, Utah.

Contract Notes

Somersworth, N. H.—The Great Falls Woolen Co. consumes about 600 tons of bituminous coal per annum.

St. Louis, Mo.—The Terminal Railroad, one of the largest coal consumers here is confining its purchases to the open market.

Cincinnati, Ohio—The E. L. Sternberger Coal Co. have contracted for the entire output of the **Eastern Kentucky Coal Co.,** whose operations are at Torch Light, Ky.

Auburn, Me.—The contract for furnishing the local Post Office building with 40 tons of New River mine-run coal has been awarded to **Pulsifer & Young** at $212. Address Postmaster Alfred T. Hicks, Auburn, Me.

Atlanta, Ga.—The Atlanta Hosiery Mills consumes approximately 400 tons of nut and slack coal per annum, deliveries being at the rate of 30 tons per month. Address Pur. Agt. Atlanta Hosiery Mills, Atlanta, Ga.

Cavendish, Vt.—Gay Bros. Co. consume about 800 tons of lump coal per annum. Deliveries are made by railroad and they have a storage capacity for 700 tons. Address Pur. Agt. J. E. Gay, Gay Bros. Co., Cavendish, Vt.

Bridgeton, R. I.—W. H. Prendergast, manufacturer at this place, consumes about 700 tons of bituminous coal per annum. Deliveries are made by railroad in carload lots. The company has a storage capacity for 100 tons.

Ardmore, S. D.—The contract for furnishing the County Government with coal during the ensuing year has been awarded to **Mosher & Kime** at $5.25 per ton for egg coal. Address County Audr. D. K. Batchelor, Ardmore, S. D.

St. Louis, Mo.—The contract for furnishing the National Lead Co. with the coal supply for its plant at Howards Station during the period ending Mar. 31, 1916, has been awarded to the **Big Muddy Coal and Iron Co.,** on Big Muddy screenings.

Philadelphia, Penn.—The contract of the Pecora Paint Co. (p. 829), involves from 600 to 1,000 tons of anthracite coal instead of 600 tons as previously noted. Address Pur. Agt. F. B. Bowen, Pecora Paint Co., 4th and Venango St., Philadelphia, Penn.

St. Louis, Mo.—The contract for furnishing the Wrought Iron Range Co. with approximately 150 tons of 2-in. screened lump coal has been awarded to the **Donk Bros. Coal and Coke Co.** Address Pur. Agt. Kalbfleisch, Wrought Iron Range Co., St. Louis, Mo.

Fall River, Mass.—The Osborn Mills at this place consume approximately 4,800 tons of bituminous and 700 tons of anthracite coal per annum. Deliveries are made by wagon from the dock. Address Pur. Agt. James T. Miller, Osborn Mills, Fall River, Mass.

Granite City, Ill.—The National Stamping and Enameling Co. will, on Friday of each week, purchase their requirements for the ensuing week; 1½-in screenings are used. Address Pur. Agt. R. C. Lutten, National Stamping and Enameling Co., Granite City, Ill.

Philadelphia, Penn.—The Philadelphia Grain Elevator Co. purchase about 120 tons of anthracite pea coal per annum. Delivery is made by Philadelphia & Reading R.R. Address Purchasing Agent, Philadelphia Grain Elevator Co., 20th and Hamilton St., Philadelphia, Penn.

St. Louis, Mo.—The contract for supply the Banner Buggy Co. and the Chevrolet Manufacturing Plant now under construction, has been awarded to the **Lumaghi Coal Co.** on 2-in. shaker screened coal. Address Pur. Agt. R. M. Taylor, Banner Buggy Co., St. Louis, Mo. .

St. Louis, Mo.—The contract for furnishing the Buck Stove and Range Co. with approximately 200 tons of 1½-in screenings per month has been awarded to the **Lumaghi Coal Co.** on their "Black Brier" coal. Address Chief Engr. Dix, Buck Stove and Range Co., St. Louis, Mo.

Shelbyville, Ill.—The contract for furnishing the City Water Works with approximately 130 tons per month of 1½-in. screenings, has been awarded to the **Lumaghi Coal Co.** on their "Black Brier" coal. Address Mgr. and Pur. Agt. C. E. Chester, City Water Works, Shelbyville, Ill.

St. Charles, Mo.—The contract for furnishing the St. Charles Milling Co., with approximately 60 tons of 2-in. screened coal per month, was awarded to the **Lumaghi Coal Co.** on their "Cantine" coal. Address Pres. and Pur. Agt. J. H. Werner, St. Charles Milling Co. St. Charles, Mo.

Cincinnati, Ohio—It is reported that the contract of the Philip Carey Manufacturing Co., involving approximately 12,000 tons of nut and slack coal for their Lockland plant has been awarded to the **Middle West Coal Co.** Address Pur. Agt. Philip Carey Manufacturing Co., Cincinnati, Ohio.

Hermann, Mo.—The contract for furnishing the Hermann Ferry and Packet Co. with approximately 60 tons of 6-in. lump coal per month has been awarded to the **Lumaghi Coal Co.** on its "Black Brier" coal. Address Secy. and Pur. Agt. Fred. Lang, Hermann Ferry and Packet Co., Hermann, Mo.

Philadelphia, Penn.—E. E. Brown & Co., Inc. consume about 400 tons of buckwheat coal per annum. The company does not contract. Deliveries are made by railroad at the rate of about one car per month. Address Pur. Agt. E. E. Brown & Co., Inc., McKearney and Meadow St., Philadelphia, Penn.

Haliock, Minn.—The contract for furnishing the County Board with coal during the ensuing year has been awarded to the **St. Anthony & Dakota** and **St. Hilaire** companies, at $10.25 for anthracite and $7.25 for bituminous, including delivery. Address County Audr. James Davnie, Hallock, Minn.

St. Louis, Mo.—The contract for furnishing the Johnston Tinfoil and Metal Co. with their fuel requirements involving approximately 155 tons per month has been awarded to the **St. Agnes Coal Co.** on Carbon lump. Address Treas. and Pur. Agt. F. H. Penney, Johnston Tinfoil and Metal Co., St. Louis, Mo.

New Britain, Conn.—Beaton & Cadwell Mfg. Co., at this place, consume approximately 200 tons of steam coal per annum. They have storage capacity for 40 tons, and deliveries are made by railroad at the rate of one car every six weeks. Address Purchasing Agent, W. H. Cadwell, New Britain, Conn.

Woonsocket, R. I.—The Guerin Spinning Co. at this place consumes approximately 1,500 tons of coal per annum. They have a storage capacity for 500 to 600 tons, and deliveries are made by wagon at the rate of two to three cars at a time. Address Pur. Agt. Ballon, Guerin Spinning Co. Social St., Woonsocket, R. I.

St. Louis, Mo.—The contract for furnishing the William's Patent Crusher and Pulverizer Co. with about 90 tons of 6x3-in. egg coal per month has been awarded to the **Big Muddy Coal and Iron Co.**, on their Herrin No. 6 coal. Address Pur. Agt., W. J. Hanson, William's Patent Crusher and Pulverizer Co., St. Louis, Mo.

Buffalo, N. Y.—The Ericsson Mfg. Co., consumes about 1,200 tons of three-quarter Youghiogheny coal per annum. Deliveries are made by railroad and at the rate of one car per week during the winter months. They have a storage capacity of 250 tons. Address Pur. Agt. H. R. Dilks, Ericsson Mfg. Co., Buffalo, N. Y.

Columbus, Ga.—George O. Berry, at this place, purchases approximately 5,000 tons of washed nut and mine-run coal per annum, deliveries being made by railroad at the rate of 400 to 500 tons per month. The company has storage capacity for 300 tons. Address Pur. Agt. F. E. Berry, care of George O. Berry, Box 5, Columbus, Ga.

Fall River, Mass.—The Richard Borden Manufacturing Co., at this place consume approximately 8,500 tons of Pocahontas coal delivered by water to the city, and by wagon to the point of consumption at the rate of approximately 28 tons per day. Address Purchasing Agent, Richard Borden Manufacturing Co., Fall River, Mass.

Philadelphia, Penn.—The Bradford Mills at this place consume about 6,000 tons of bituminous coal per annum. They have storage capacity for 900 tons, and deliveries are made by Philadelphia & Reading Ry. at the rate of about three cars per week. Address Pur. Agt., M. A. Spencer, Bradford Mills, 28 N. Front St., Philadelphia, Penn.

Granite City, Ill.—The contract for furnishing the Western Fire Brick Co. with its fuel requirements involving approximately 175 tons per month of 1½-in. or 2-in. screenings. has been awarded to the **Borders Coal Co.** on Franklin 2-in. screenings. Address Gen. Mgr. and Pur. Agt. George Hanlon, Western Fire Brick Co., Granite City, Ill.

St. Louis, Mo.—The contract for furnishing the Reliance Buggy Co., with its fuel requirements during the coming season, involving approximately 300 tons of Nos. 2 or 3 washed nut coal per month, has been awarded to the **Southern Coal, Coke and Mining Co.** Address Gen. Mgr. P. E. Ebrenz, Reliance Buggy Co., St. Louis, Mo.

St. Louis, Mo.—The contract for furnishing the New National Oil Cloth Co. with its annual fuel requirements, involving approximately 60 tons of mine-run coal per week, has been awarded to the **Lumaghi Coal Co.** on their Black Brier Southern Illinois coal. Address Genl. Mgr. and Pur. Agt. Wm. Oepts, New National Oil Cloth Co., St. Louis, Mo.

Findlay, Ohio—The contract for furnishing the Findlay Water Works with approximately 2,000 tons of coal during the ensuing year has been awarded to the **Sunday Creek Coal Co.** at 85c. per ton f.o.b. mines. It is understood the contract will be filled on Smithers Creek mine-run coal. Address Purchasing Agent Findlay Water Works, Findlay, Ohio.

Ensley, Ala.—The Bessemer Fire Brick Co., at this place, consume approximately 12,000 tons of mine-run coal per annum. Deliveries are made by railroad, at the rate of 250 tons per week, and the company has storage capacity for 500 tons. The coal is bought in the open market. Address Pur. Agt. J. W. Minor, Bessemer Fire Brick Co., Ensley, Ala.

St. Louis, Mo.—The contract for furnishing the Curtis Manufacturing Co. with approximately 125 tons per week of No. 2 washed nut coal for power use has been awarded to **Southern Coal, Coke and Mining Co.** Oil was recently substituted for coal at this plant for the purposes of annealing. Address Pur. Agt. John A. A. Hecker, Curtis Manufacturing Co., St. Louis, Mo.

Philadelphia, Penn.—Smith, Kline & French Co., at this place, consumes about 2,500 tons of Highland buckwheat coal per annum. Deliveries are made by railroad at the rate of about one 45- to 50-ton car per week, and the company has storage capacity for 75 tons. Address Pur. Agt. W. G. McHenry, Smith, Kline & French Co., 35 Poplar St., Philadelphia, Penn.

St. Louis, Mo.—The contract for furnishing the Railway Exchange Bldg. with from 100 to 200 tons per day of 1½ in. screenings delivered in wagon-load lots, has been awarded to the **Polar Wave Ice and Fuel Co.** It is understood the contract will be filled on Carterville (Southern Illinois) coal. Address Pur. Agt. Ziegenfiss, Railway Exchange Bldg., St. Louis, Mo.

Chattanooga, Tenn.—The Southern Clay Manufacturing Co. consumes about 20,400 tons of No. 2 mine-run, nut and slack at the Tennessee plant, and about 10,100 tons of the same at the Alabama plant. Deliveries are made by rail and wagon at the rate of approximately 2,500 tons per month. Address Pur. Agt. W. C. Brown, Southern Clay Manufacturing Co., 707 James Bldg., Chattanooga, Tenn.

St. Louis, Mo.—The contract for furnishing the Walsh Fire Clay Products Co. with approximately 1,000 tons per month of 2-in. screened lump coal has been awarded to the **Big Muddy Coal and Iron Co.** The coal for the Vandalia, Mo., plant of the Fire Clay Co. is being supplied under contract by the Mount Olive and Staunton Coal companies. Address Pur. Agt. Parker, Walsh Fire Clay Products Co., St. Louis, Mo.

Waterloo, Iowa—The Waterloo, Cedar Falls & Northern Ry. consume approximately 30,000 tons of Iowa screenings, 1,500 tons of Illinois lump and 150 tons of anthracite nut coal per annum. Deliveries are made by railroad at the rate of 600 tons per week, and the company has storage capacity for 1,000 tons. The company has a three-year contract, which expires Apr. 1, 1918. Address Pur. Agt. F. McDonald, Waterloo, Cedar Falls & Northern Ry., Lafayette Bldg., Waterloo, Iowa.

Italy—A prominent Italian business firm, having large connections, desires to represent a coal company that is in a financial position to fulfil its contracts, and has a quality of coal required on that market. They would have to be in a position to compete with the leading American exporters, as on equal terms the correspondent asserts he can always secure the business. Bidders must cut prices to the very lowest point calculating a commission of 10c. per ton on that side. It is absolutely essential that they offer c.i.f. prices west coast of Italy. The above mentioned competitors have often been able to do so. For additional particulars address the Market Editor, "Coal Age."

COAL AGE

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Coal Mining and Water

OWNERS of coal mines in their anxiety to save on operating costs often center their gaze far off when matters of moment are close at hand. *For example,* there is the question of water, which is an everyday problem at eight out of ten mines. Call in the mine manager or superintendent and say to him:

> *You know how many tons of water are raised at your mine for every ton of coal hoisted.*
>
> *You also know your cost for power per horsepower per year.*

But—

Do you know how much of the total water pumped is surface water which can be prevented from entering your mine?

Do you know the size of stream which, if allowed to run into the mine workings, will give you 10,000 gallons in 24 hours?

Do you know what horsepower is required to pump 10,000 gallons from your mine?

Do you know whether or not the waste water from your power plant is drained safely away, or does it soak into the ground and ultimately enter the mine?

Do you know if the brooks and streams are diverted or carried safely across your broken ground?

Do you know how many little streams of 10,000 gallons per 24 hours you may stop from entering your mine?

* * *

IF your manager or superintendent is unable to answer the foregoing questions, he is either "asleep at the switch," or he is a low-power official in a land of many hills. While you are waking him up or hunting for a substitute, GO OVER THE GROUND *overlying your mines with your chief engineer, and if you find that you cannot spend some money in drainage, etc., that will pay a larger dividend on each dollar so invested than you are paying to your stockholders, sign your name* COAL OPERATOR UNIQUE.

The Storage of Coal--I

By John B. C. Kershaw*

SYNOPSIS—This is the first of three articles on the subject of coal storage. The text of this initial installment deals particularly with the chemical and physical constitution of coal. The author states that the percentage of volatile matter yielded by a fuel is no guide to its inflammability. A method of determining the relative proportions of readily decomposed constituents in different coals is given.

The storage of coal is a subject that has attracted considerable attention in recent years. The dangers that attend any lengthened interference with the mainspring of the national position and wealth or with the supplies of the chief raw material of the transporting and manufacturing industries have been brought home to us in recent years by serious labor disputes and strikes in the coal-mining districts of the world. As a result of these disturbances, it has become a fixed policy on the part of those in charge of railway and transport services, electric-light and power plants, gas-works, water works and all large manufacturing undertakings to carry large stocks of coal, in order to be prepared for any emergencies that may arise.

A great variety of methods and many different types of stock heaps and storage bins have been tried for this purpose. The problem is not as simple as it would be if the material to be stored underwent no physical or chemical changes in the process. Nearly all coals deteriorate rapidly under certain conditions of storage and exposure, and there are the further dangers of heating and spontaneous combustion to which certain classes of coal are specially liable. The problem of coal storage is therefore intimately associated with the chemical constitution of coal and with the changes that occur in it when heated, and the subject cannot be dealt with adequately unless this side of the problem is carefully studied and discussed.

In these articles I intend to approach the subject first from the theoretical and then from the practical standpoint. It is hoped that this discussion of the question of coal storage may prove of value to all who already have large stocks of fuel under their care or who contemplate forming such stock heaps in the near future.

The Constitution of Coal

All naturally occurring solid fuels are modifications of cellulose or woody fiber brought about by great pressure and heat in the strata of the earth's crust. Cellulose, which may be regarded as the raw material of coal, contains carbon, hydrogen and oxygen and is represented by the chemical formula $C_6H_{10}O_5$. It contains 44 per cent. of carbon by weight.

The process of conversion of cellulose into the various classes of solid fuel with which we are familiar has been accompanied by a gradual escape of the hydrogen and oxygen which make up 56 per cent. of its weight and by a gradual increase in the density and hardness of the product. The following table gives the relative percentages of hydrogen, oxygen, nitrogen and carbon in the more commonly occurring solid fuels found in the earth, and it is interesting to note the gradual increase in the density of the fuel and in the percentage of carbon as one gets deeper and deeper into the bowels of the earth and farther away from the present geological epoch of time.

TABLE 1. SUCCESSIVE STAGES OF CHANGE IN THE FORMATION OF SOLID FUELS

	Carbon, %	Nitrogen and Oxygen, %	Hydrogen, %
Wood (cellulose)	44	50	6
Peat	60	34	6
Brown coal (lignite)........	67	27	6
Bituminous coal	85	8	5
Semianthracite or steam coal	88	6	4
Anthracite	94	2½	1½

Note—Ash is deducted in all the above tests, and the percentages are calculated on the ash-free fuel.

Geologists assert that anthracite is the oldest of the naturally occurring solid fuels, and it is believed that many thousands of years have elapsed since those strata of the earth above which the anthracite is found were on the earth's surface and covered with swamps and vegetation.

The differences between the various classes of solid fuel can be most easily noted by heating strongly (to a red heat) one gram of the powdered fuel in a closed platinum crucible with a tightly fitting lid. The older anthracite and the semianthracite (or steam coals) give off only comparatively small amounts of hydrocarbon vapors; the bituminous and "cannel" coals swell up and yield one-third or more of their weight of volatile matter which burns with a luminous flame as it escapes from the crucible. The residue that remains in the crucible after these volatile constituents of the fuel have been driven off is composed of fixed carbon plus the mineral constituents of the fuel; and from the physical character of this coke the class to which the fuel belongs may be determined. The following table gives average figures for the approximate analysis of the various classes of fuel:

TABLE 2. APPROXIMATE COMPOSITION OF TYPICAL FUELS

Class	Coke, %	Fixed Carbon, %	Volatile %	Ash, %
Anthracite	96	93	4	3
Steam coals	88	78	12	10
Bituminous coal	67	57	33	10
Peat	32	30	68	2

It must be remembered that the carbon, hydrogen, oxygen and nitrogen are present in the natural solid fuel in forms of combination that have not yet been fully investigated and that the gaseous and solid products obtained on heating coal are "decomposition products."

According to Wheeler, coal may be regarded as a conglomerate of two main types of compound. One of these on heating to a comparatively low temperature yields inflammable gases and vapors, while the other class requires a higher temperature and prolonged heating to decompose it. In a paper contributed to the Chemical Society, London, in 1911, Wheeler and Burgess described an apparatus and method by means of which they had been able to collect separately the whole of the gases evolved from different samples of coal at different stages in the heating process.

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*Liverpool, England.

They had previously shown that a compound existed in coal which decomposed rapidly at a temperature lying between 700 deg. C. and 800 deg. C. and yielded hydrogen as its principal gaseous product. At the same time it was evident that at lower temperatures of distillation the paraffin hydrocarbons, and not hydrogen, were the chief products; and it seemed reasonable to suppose that the difference was due principally to the temperature at which decomposition was effected.

From the results given in a later paper by the same author, it is apparent that coal contains a compound of less stability to the action of heat and that this less stable compound yields the paraffins as its gaseous decomposition products. Thus they find that the paraffin hydrocarbons form by far the largest proportions of the first gases evolved at temperatures either above or below the "critical period" of decomposition. At temperatures below the critical period, during the first few seconds of heating, 1 or 2 per cent. of hydrogen at most is evolved.

Presumably, therefore, coal contains two types of compounds of different degrees of ease of decomposition—the one, the more unstable, yielding the paraffin hydrocarbons and no hydrogen; the other, decomposed with greater difficulty, yielding hydrogen alone as its gaseous decomposition product.

There seems therefore to be considerable justification according to Wheeler and Burgess for assuming that one type of compound in coal, and the most important type, is a degradation product of cellulose. This type, from preliminary experiments the authors have made on the destructive distillation at high temperatures of pure cellulose and oxycellulose, is identified with the "hydrogen-yielding constituents" indicated by their experiments with coal. The "paraffin-yielding constituents" are most probably derived from the resins and gums originally contained in the sap of the coal plants, and these form the "cement" of a conglomerate of which the cellulose derivatives are the base.

Inflammability of Dust

A property common to all coals is their inflammability when in the form of dust, and in a third paper communicated to the Chemical Society, London, in 1913, Wheeler gives details of an investigation carried out by him in 1911-1913 to prove that the percentage of volatile matter yielded by a fuel is no guide to its inflammability. That there should be no relationship between the inflammability of different coal dusts and their contents of volatile matter as determined in the usual manner is not surprising. The determination of volatile matter simply consists in heating the coals to a high temperature and in driving off the gases that can be driven off at that temperature. Such a process can make no distinction between substances of different ease of decomposition that may be present in the coal, for it decomposes them all; nor can it offer any information regarding the proportions in which such substances may exist in different coals.

It was necessary in Wheeler's investigation to obtain some means of determining the relative proportions of readily decomposed constituents in different coals. The method employed was to measure the volumes of paraffins evolved per gram of the ash-free dry coals on heating them in a vacuum at 650 deg. C. A more readily applied method is that of determining the percentages of the coals extractable by pyridine. The extraction with pyridine was carried out on from 3 to 10 grams of the dried and sieved coal dust in a Soxhlet fat-extraction apparatus. Some coals were attacked by pyridine much more rapidly than others, a dark burnt-amber color being imparted to the liquid in contact with the coal.

Such coals usually, but not always, contained a high percentage of extractive matter. Other coals gave to the pyridine a light raw-sienna color, the solution being highly fluorescent; these coals yielded between 20 and 25 per cent. of their weight to solution in pyridine. This extraction does not effect a complete separation of the resinous ("paraffin-yielding") from the humus ("hydrogen-yielding") constituents, but inasmuch as all that requires to be known is the relative proportions of the former in a number of coals, for comparison with their relative inflammabilities, complete separation was not necessary. We may therefore according to Wheeler take the percentage extractable by pyridine as affording a rough measure of the relative proportions of readily decomposed constituents in the coals experimented with. The following table, giving some of Wheeler's results, has been compiled from the figures given in his Chemical Society paper of 1913:

TABLE 3. PYRIDINE EXTRACTIONS OF COALS COMPARED WITH THE RESULTS OF THEIR APPROXIMATE ANALYSES AND RELATIVE INFLAMMABILITIES

Relative Inflammability, Deg. C.	Pyridine Extraction, %	Volatile Matter, %	Fixed Carbon, %	Ash, %
995	38.8	32.7	60.8	4.5
1005	37.9	30.6	64.7	4.1
1015	36.2	35.7	60.0	2.2
1020	34.9	31.6	62.7	4.8
1025	34.7	31.4	64.3	2.8
1035	29.7	35.0	62.0	1.2
1045	27.9	32.4	63.1	2.5
1055	28.0	33.5	59.7	4.6
1065	28.1	30.8	64.6	4.1
1075	26.4	32.8	56.4	4.1
1095	18.0	25.0	71.1	3.6

A similar investigation relating to the ultimate constitution of coal by means of solvents has been carried out in the United States by Parr and Hadley, and the results have been published by the University of Illinois in Bulletin No. 76, Nov. 1914.

Results of an Important Investigation

The authors' summary of their results and conclusions, which support those of Wheeler, is as follows:

1. A study of solvents for the purpose of subdividing coal constituents without decomposition was carried out. Phenol was adopted as the most active solvent for the purpose of the investigation. 2. An apparatus was devised for carrying out the extraction so that the temperature of the phenol would be above 110 deg. 3. The application of the method to different types of coal showed that coal varied widely in the amount of material dissolved by phenol. The amount of soluble material seemed to differentiate sharply between subdivisions of coal types. On the ash and moisture-free basis the high volatile coals of Vermilion County, Illinois, give 35 to 40 per cent. of soluble material, the coals from Madison and Montgomery Counties in the same state give 30 to 35 per cent. and the low volatile coals of Williamson County, Illinois, show 20 to 30 per cent. of soluble material. 4. Extraction of coal leaves a residue which will not coke. The coking constituent of the coal is in the extract. 5. Residue and extract oxidize at room temperatures, and more readily at 100 deg., the rate of oxidation being more rapid in the residue. 6. Residue and extract possess an avidity for water as well as for oxygen at ordinary temperatures. The residue shows the

greater avidity in both cases. 7. Volatile matter determinations show that the extract contains more volatile matter than the residue. 8. The ultimate analysis of the coal, residue and extract shows that the percentage composition of carbon, hydrogen, nitrogen and oxygen is substantially the same. 9. Destructive distillation of the coal residue and extract gave gases of practically the same composition. 10. Oxidation of the coal residue or extract produces a lowering in the percentage of volatile matter. 11. Oxidation decreases the amount of material which may be extracted from coal by phenol, and the coking properties are also decreased in proportion to the extent of the oxidation. 12. Oxidation of the coal, residue and extract is shown by the increase in the percentage of carbon dioxide in the gases produced by thermal decomposition. It is concluded, therefore, that the oxygen absorbed is chemically held.

Proper Diameter of Sheaves for Hoisting Rope*

The increase in stress caused by running a rope over too small a sheave is unimportant compared with the resulting increase in rope wear, and considerations of economy can be trusted to prevent the use of sheaves and drums too small for the ropes.

The economical ratio between rope and sheave diameters varies with the character of the wire in the rope and the type of construction. A pliable rope can run more economically and safely over a small sheave than can a stiffer rope. The committee has reports of excellent results from the use of a 1¼-in. rope over an 84-in. sheave, which gives a ratio of 66, whereas in many cases, especially in deep shafts with long ropes which usually are of necessity stiffer, a ratio of 100 has been recognized as not too high.

In connection with the question of sheave diameters, one point should be noted—namely, that it is possible to make the ratio too high under certain conditions, or more correctly stated, it is possible to make the sheave too heavy. This is the case frequently with turn-sheaves, guide pulleys, rollers, etc., on which the arc of contact and the compression between sheave and rope may be so little as to allow slip, the rope failing to rotate the sheave.

Of course such a condition would cause wear and tend to deteriorate the rope faster than would the use of a smaller, lighter sheave. To decide on a suitable size of sheave under such conditions the following rule is serviceable: Suppose that a ratio between sheave and rope diameters of 72 is considered permissible. Then a 1-in. rope would require a 6-ft. sheave. When the deflection is 90 deg., this same result would be obtained by a rule reading: Multiply the degree of deflection by eight-tenths and by the diameter of the rope.

Apply this modified rule where the deflection angle of the rope is less than 90 deg.—that is, when the rope has less than 90 deg. of contact arc on the sheave—and as the deflection angle or arc of contact becomes less, the size of the sheave will decrease. Under this rule, for a 45-deg. deflection angle a 3-ft. sheave will be required when a 1-in. rope is used, and for a zero degree or straightaway pull no sheave is needed.

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*Abstract from "Rules and Regulations for Metal Mines," by Ingalls, Douglas, Finlay, Channing and Hammond; Bulletin 75, United States Geological Survey.

Coal Output of South Africa

The Union of South Africa publishes its coal production in short tons and follows the unusual practice of announcing how many pounds there are to a ton. There are many states in our Union that would do well to take that precaution. It is usually impossible to glean from the context what is the size of the ton used, and in some states coal is sold by the long ton and recorded by the short ton. Yet no record is made in the state report to inform the reader which ton is used.

The record of the Union of South Africa for 1914 follows, based on $4.86 per pound sterling:

Province	Tons Sold	Value at Mine	Value per Ton
Transvaal	5,157,268	$5,592,626	$1.08
Cape	53,621	151,472	2.82
Orange Free State	699,217	928,571	1.33
Natal	2,567,817	4,305,566	1.68
Union of South Africa	8,477,923	$10,978,235	$1.29

The high price of the Cape and Natal coals is largely owing to the amount of cleaning necessary. The Cape coal operators in August of this year rejected as waste 20.83 per cent. of the material mined, and the Natal operators so consigned 26.63 per cent., whereas the rejected material in the Transvaal was 12.97 per cent.

The Bugbear

By Rufus T. Strohm

Written expressly for
Coal Age

⁂

HE calls himself a mining man
And always speaks the title loudly,
While in his dealings with his clan
He acts impressively and proudly.
So downright practical is he,
So shy of mental acrobatics,
That he regards most hostilely
The faintest sign of mathematics.

IN reading, if his searching eyes
Fall foul of vinculum or bracket,
You see his ardent temper rise
And hear him make a fearful racket.
With something of the burning hate
Displayed by madmen or fanatics,
So is he wont to contemplate
The varied forms of mathematics.

A HARMLESS radical is quite
Sufficient cause to make him hectic,
And as for formulas, the sight
Of one will drive him apoplectic.
He swears he cannot see the need
Of learning rubbish like quadratics,
And cannot be induced to read
A book involving mathematics.

THERE are a thousand things or so
On which he needs some information;
Like air compression, water flow,
Specific heat, and ventilation.
He ought to furbish up his brain
On heat, kinetics, hydrostatics,
Yet foolishly, with might and main,
He scorns the aid of mathematics.

HE does his best, by rule of thumb,
To meet the problems that beset him,
Nor dreams the fatal day will come
When dullness and neglect will get him.
With others, he would rather snooze,
While cobwebs wreathe their mental attics,
Than buckle down and learn to use
The principles of mathematics.

Fuel-Combustion Improvers

SYNOPSIS—From time to time various chemical substances or the product of mechanical processes is placed upon the market with claims that these improve combustion, increase boiler efficiency, abate the smoke nuisance, decrease the cost of power, etc. A scientific test seldom fails to reveal the fallacy of such assertions, although certain mechanical processes possess a definite economic value if not overburdened with extravagant claims. The most efficient saver of fuel is a careful fireman.

In discussing the subject of combustion improvers broadly, two general divisions present themselves naturally—(a) mechanical devices and (b) chemical compounds, or a combination of some physical or chemical process, illustrated by briquetting a fuel with a chemical binder.

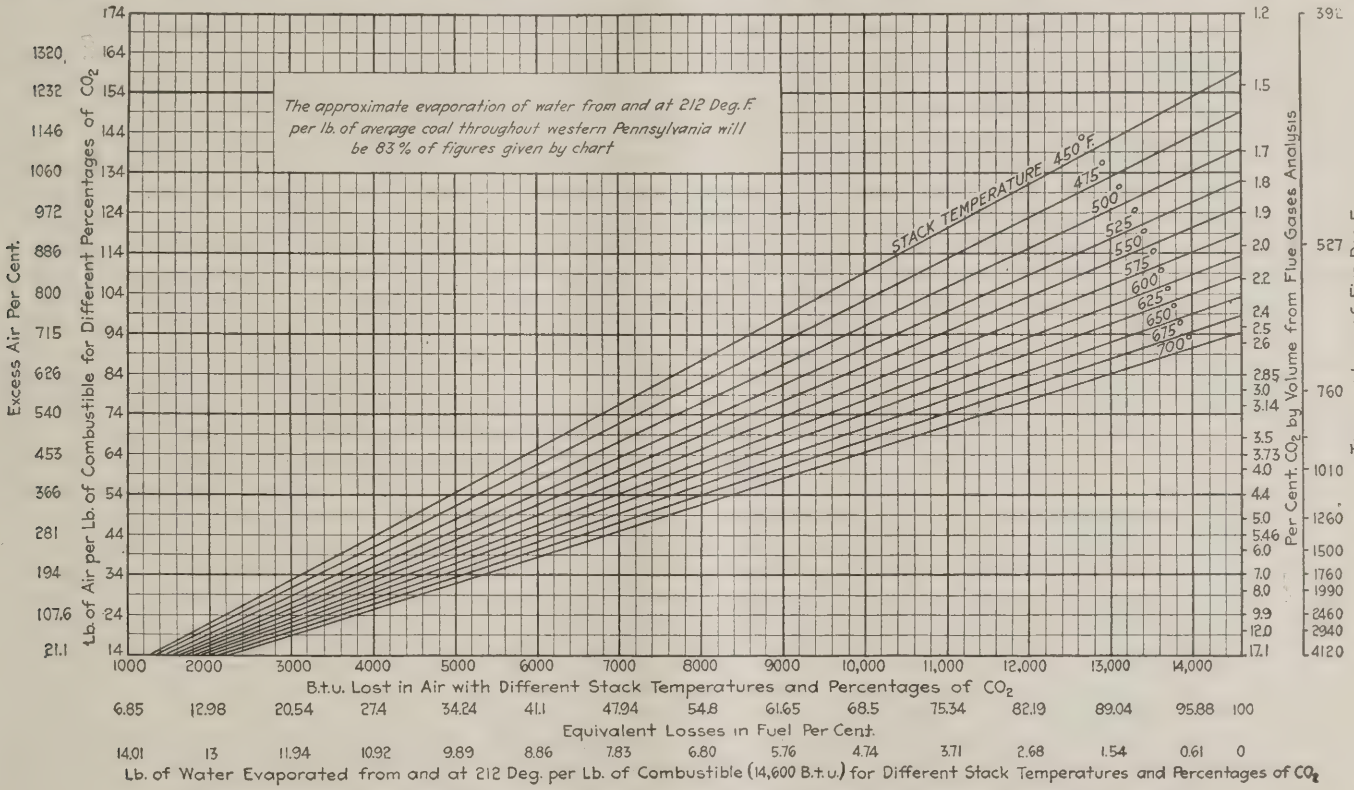


CHART SHOWING APPROXIMATE EVAPORATION OF WATER PER POUND OF COAL

As applied to the generation of steam for a boiler plant, an improver of combustion or an economizer of fuel could be defined as "A means of evaporating more water per pound of fuel than could be secured otherwise, as obtained under standard conditions of weighing the water evaporated, the fuel used, ashes produced," etc.

In these days of constant urging on the part of Government officials to conserve the natural resources of the country, economy in steam generation has come to the front. With it have come a vast number of mechanical devices and chemical preparations. The sponsors for them are for the most part sincere in their belief that they have a wonderful device or preparation by which a ton of coal can be made to evaporate twice as much water as it did formerly. Once in a while we come across a rank imposter or charlatan, one who knows his scheme is no good, but who is smooth enough to "put it over by hook or crook."

In a close analysis of the situation it is found that the majority of the exponents of the various devices and compounds on the market are not technical men. It's a case of "a little knowledge is a dangerous thing." One man who had spent a number of years in promoting a special process of fuel treatment to enhance its heating value did not know what a British thermal unit meant and recklessly asserted that anthracite coal had a higher percentage of volatile matter than bituminous, and for that reason his process was no good for the latter, for it was the volatiles he conserved. Another man confidently told a mechanical engineer that he could obtain 150 per cent. efficiency from his device for injecting superheated steam into the firebox of the boiler. And so on *ad infinitum.*

You cannot get something from nothing. In the case of mechanical devices for economy in steam generation, they must be along well-known and approved lines, else they fail of their purpose. In the case of chemical binders and solutions they must have an inherent heat value or act as catalyzers, otherwise they are diluents. Let us proceed to a few concrete examples:

Some years ago a man had a scheme of briquetting coke breeze, or coke ashes as they are popularly designated in the region where they are produced. His purpose was laudable, as there are thousands of tons of this waste from beehive ovens in the coke-making district accumulated in the years gone by which would be immediately available as a cheap fuel if some economical and satisfactory cleaning and briquetting scheme were developed.

This particular scheme was comprehensive. A big company was to buy up all the "ash dumps" and paralyze the regular coal trade by the cheapness and efficiency of its own product. Why did this most beneficent briquetting project fail? Let us examine the so-called composition fuel, analysis of which is given in the following table:

	Briquetted Coke Breeze	Natural Breeze
Volatile matter	14.52%	10.00%
Fixed carbon	33.51%	59.50%
Ash	57.97%	30.50%
Sulphur	0.80%	0.85%
Heat content, B.t.u.	6,594	9,890
Composition of the ash:		
Silica (SiO_2)	11.64%	
Alumina (Al_2O_3)	6.20%	
Lime (CaO)	15.14%	
Magnesia (MgO)	0.30%	
Iron oxide (Fe_2O_3)	15.86%	

The analysis of the ash of the composition fuel shows that plain, everyday cement was used as a binder in the briquetting process, as evidenced by the lime content and the physical appearance of the briquette itself. It did not take the consumer long to "get next" to the fact that for every ton of fuel burned more than a half-ton of ashes was produced. He did not need a chemical analysis to prove to him that such a fuel was dear at any price.

In this case the binder acted as a diluent, since it had no inherent heating value. It will be noted that the heat value of the composition fuel is only about two-thirds of that of the coke breeze in its natural state.

More subtle and convincing is the second instance, which had to deal with a chemical to be dissolved in water and sprayed on the coal or other fuel. Besides increasing the efficiency of fuel 25 per cent. or more, the additional claims were made that the use of the solution removed the sulphur, prevented clinkers and solved the smoke problem.

A physical examination of the solution used showed it had a specific gravity of about 1.05, which indicated approximately a 5 per cent. solution. In practice, 10 gal. of the solution to the ton was sprayed on the fuel as it was fired under the boilers. At this rate, not over ¼ per cent. of the chemical at the most would actually get on the coal.

Thus it will readily be seen that it must be a pretty active chemical to produce such amazing results in efficiency—¼ per cent. to give 25 per cent. more heating value to the fuel. *Mirabile dictu.* The chemical examination of the compound to be dissolved in water is as follows:

Silica (SiO_2)	4.14%	Magnesia (MgO)	1.37%
Alumina (Al_2O_3)	11.33%	Sodium (Na)	3.83%
Calcium (Ca)	11.10%	Chlorine (Cl)	22.80%
Lime (CaO)	1.68%	Water and loss	42.94%

Dropping the terminology, in plain English the basis of the compound used was calcium chloride, a byproduct of the soda-ash industry. Ordinarily this chemical sells for about ¾c. per lb., yet as a combustion improver it sold for 10c. per lb. A rose by any other name would not smell as sweet, it seems. There is a prevailing belief that saline substances like common salt, thrown on a fire, make it burn brighter and give off more heat. At least that must have been the notion of the promoter of calcium chloride.

As stated previously, practical firing tests indicated an apparent saving of fuel when treated with the calcium chloride solution. It would convince the ordinary boiler house fireman, but the fallacy was shown on making evaporation tests.

For instance, a firing test lasting 5 hr. showed an apparent saving of about 20 per cent. by the use of treated coal, yet an evaporative test showed that practically the same amount of water per pound of coal was evaporated by the use of untreated coal as with the treated fuel. Furthermore, it was found that by spraying the dry raw coal with water—10 gal. to the ton—there was the same apparent saving in fuel as was obtained by the use of the chemical solution, yet no greater evaporation of water.

THE USE OF SALINE SOLUTIONS

The logical conclusion was that the "joker" was in wetting the coal, the calcium chloride exerting no influence whatever on the heating value of the fuel. Anyhow, if some boiler-room men think they obtain a greater efficiency by the use of saline solutions sprayed on coal, it would be great economy to buy the chlorides themselves instead of purchasing them in the form of expensive compounds.

As for the prevention of clinkers, it is almost absurd to think that such small amounts as ¼ per cent. of any chemical would exert any beneficent influence. The idea put forth was to combine the sulphur with the ashes by the use of the lime salt, but it did not work out, as evidenced by the following analysis:

	Raw Coal	Boiler Ashes
Volatile matter	28.090%	3.700%
Fixed carbon	62.260%	23.020%
Ash	9.650%	73.280%
Sulphur	1.235%	0.378%
Heat content, B.t.u.	13,209	....

It will be noted that there is still some combustible in the ashes, else the sulphur would probably have all been burned out.

The flue gas from the coal treated with calcium chloride is normal, and as far as could be determined, the "smoke nuisance" was not abated. This is the analysis of the flue gas:

	By Volume
Carbon dioxide (CO_2)	7.4%
Oxygen (O_2)	11.2%
Carbon monoxide (CO)	nil
Methane (CH_4)	0.2%
Nitrogen (N_2)	81.2%

A third gentleman spent 8 or 10 yr. in perfecting a briquetting scheme for anthracite culm, which corresponds to the waste from coke ovens. This was another laudable undertaking, but unfortunately the briquetted fuel did not meet the claims of the enthusiastic inventor.

This briquetting scheme was along well-known and approved lines, the binder probably being a coal-tar derivative. The mistake of the promoter was in the claim made for enhancing the heat value—as much as 100 per cent. It would not take an intelligent consumer long to find out he was being "stung." The analyses of some of the briquettes are as follows:

	Sample No. 1, Anthracite Culm Briquettes	Sample No. 2, Stove or Chestnut Anthracite
Volatile matter	12.760%	12.220%
Fixed carbon	58.740%	77.280%
Ash	28.500%	10.500%
Sulphur	1.007%	0.769%
Heat content, B.t.u.	9,030	12,347
Composition of the ash:		
Phosphorus (P)	0.020%	0.036%
Silica (SiO_2)	16.130%	4.670%
Alumina (Al_2O_3)	8.310%	3.320%
Lime (CaO)	0.300%	0.440%
Magnesia (MgO)	0.100%	0.100%
Iron oxide (Fe_2O_3)	1.500%	0.930%

It is readily seen from the analysis that there is no enhancement of the heating value, though the binder does not act as a diluent as in the first briquetting scheme. The briquette was bona fide in that respect, and such a process has a positive commercial value when not improperly exploited. The chemical analysis shows that about 5 per cent. of the so-called binder was used, which in addition to the great pressure exerted in the process made a very acceptable briquette or eggette.

Finally, the best combustion improver or fuel economizer is the man who shovels coal into the boiler furnace if hand-firing is the practice. If correct methods of firing were introduced in the boiler room and followed up, there would be little need for artificial accelerators. The temperature of the stack gases, their composition, the depth of the fire, etc., have more to do with the amount of water evaporated per pound of coal than anything else.

Any campaign for economy should be along these lines. It would appear well worth while to install portable gas-analyzing outfits in the boiler room to check up the combustion. This method used in conjunction with the stack temperatures would serve to show the losses in fuel or the efficiency attained.

P. W. Matthews, a mechanical engineer of Scottdale, Penn., has worked up an interesting chart that could be used to advantage in the interpretation of the results of the flue-gas analysis and the stack temperatures. This is shown herewith.

To illustrate: Assuming that the flue gas shows 5 per cent. CO_2 and the stack temperature is 600° F., by referring to the chart it will be found that there is a loss in fuel of about 41 per cent. and that only 7.4 lb. of water is evaporated per pound of coal, with the correction noted. Again, if the stack gas shows 10 per cent. CO_2 and 500° F., the loss in fuel is between 16 and 17 per cent., and the water evaporated (12×0.83) is about 10 lb. per pound of coal.

In the flue gas cited elsewhere, with 7.4 per cent. CO_2, the fuel loss is about 23 per cent. and the water evaporated about 9½ lb. By actual weight the water evaporated was 9.2 lb. per pound of coal.

Mr. Matthews' chart is novel and should demand attention from those interested in fuel economy.

Extracts from a Superintendent's Diary

Today I rode through a deserted coal-mining camp. Only a few years ago it was known far and wide as the model camp of the state, but now its glory has faded and rack and ruin greet the eye at every turn. Any abandoned mining camp presents a cheerless prospect to a visitor, but to see this once-prosperous village so quickly reduced to the last stages of decay was especially depressing to me because I am familiar with so much of its inside history.

The founder of the camp was a true reformer with advanced ideas about the responsibilities attached to wealth, and in planning his village he left no stone unturned in his effort to meet all of the responsibilities as he saw them. One-half of the residence portion of the camp was reserved for men who might desire to purchase their own homes, and every encouragement was given to workers to make such purchases possible. The lots were sold at a price that left only a fair profit on the original investment, and houses were built to suit the purchasers on payments spread over long periods.

Many of the lots were sold and attractive homes sprang up everywhere. Still today the man who planned it all rests in a suicide's grave, and all over the land men and women recall him as the man who induced them to make unfortunate investments from which they will probably never fully recover. A few have lived long enough to become convinced that the failure of the mine could not have been foreseen, but just after the crash, almost to a man, they believed that the failure was premeditated. Even after the founder took his life, feeling against him ran high, and rumor had it that the deed was the result of a troubled conscience.

If unlooked-for faults had been encountered or the company had been wrecked by a terrible calamity, such as a fire or an explosion, people might have understood; but how can simple folk be expected to understand that the opening of a new coal field, entitled to lower freight rates on account of its location, may force competing companies into bankruptcy?

Nor was the lot of the founder a happy one even before the final crash. At one time the workers called a strike, and almost as soon as the men walked out reporters arrived on the scene to fill the newspapers with stories about the heartless mine owner who contemplated closing down his mine that he might starve his employees into submission and that in face of the fact that these selfsame employees had invested their savings in his enterprise. And during normal times occasionally the wanderlust would seize one of the workers who had invested in a home, and if forthwith he could not find a purchaser (as if such a thing were possible anywhere) he would begin to make remarks about the man who had made him a slave for life. In contrast to the man who desired to leave and could not, would often be found a man who should have been forced to leave because of violation of rules and regulations, yet was allowed to remain because the founder could not long enough get his concience under control to order the man out of a home which he himself had sold him.

It seems a hard thing to say, but I returned home today firm in the conviction that the majority of mining men are ever destined to be homeless wanderers on the face of the earth, not because mine owners are indifferent to their responsibilities, but because fate so wills.

* * *

CHRISTMAS PRESENTS

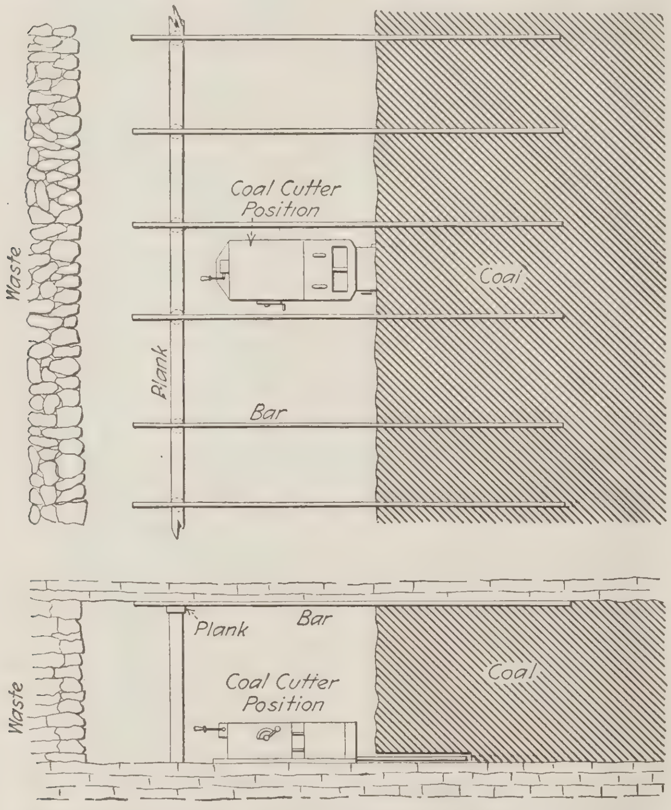
Details of Cutter Operations

By J. F. K. Brown*

Sometimes in the course of operating coal-cutters, local areas of bad roof develop. As a rule such occurrences are most frequently met with in those seams which have either a shale covering or a thin sandstone roof with shale above. In nearly all cases it is the management's desire to keep up the roof if possible in order to avoid unnecessary deadwork, since when under these circumstances a roof develops frequent falls because of a local weakness in the strata, there is a much increased cost of operation placed upon that section.

Furthermore, a roof of this nature, when once broken, frequently is difficult to catch again, and so the trouble gradually spreads until it may perhaps cover a wide area.

In one case where trouble from such a cause was constantly occurring, the following steps were taken to counteract it. The seam was 4 ft. 6 in. thick, and the roof was a shale in which false bedding was strongly developed. Under normal conditions, operating a coal-cutter at night undercutting the seam 3 ft., this roof proved satisfactory, but there occasionally developed areas in which the shale would start falling heavily, or "running," as far as could be judged, through an extra well-developed line of bedding.



SKETCH SHOWING HOW THE BARS WERE HANDLED

Once this fall took place, it became a regular nightly occurrence to find the machine buried at this point, and as the face advanced farther, this broken area gradually widened out. It seemed possible that only after a great expenditure of money on extra timbering during many months' work would the regular roof be again held. To overcome the difficulty, as soon as a soft spot manifested itself a policy of supporting the roof in advance of the coal-cutter was adopted.

Twelve 1-in. iron rods, 9 ft. long, were obtained and, with a 3x2-in. plank at least 12 to 15 ft. long, were brought into the workings, as was also a drill with an extra long twist steel and a 1½-in. bit of such a type that drilling could take place in a practically horizontal plane at the roof of the seam.

With the drill, holes were driven horizontally at the roof about 3 ft. apart to a depth of roughly 6 to 8 ft., the rods being inserted and the projecting ends upheld by the plank, which in turn was "propped" by the usual mine timber. This provided a support for the roof before the coal-cutter came along during the night shift.

On the coal-cutter reaching the props supporting the plank, they were withdrawn one by one as the machine advanced and reset behind it. When the coal was loaded out, the rods had still about 3 ft. of advance grip on the coal roof. The alternate rods were then withdrawn and drilled in again a further 3 ft. or more, until the entire set had been advanced to the original position ready for the night's cut. This process was repeated until the roof appeared to have regained its normal strength, when the rods and plank were laid aside for future use.

By this means the skin of the roof on the top of the coal is preserved intact, and a great deal of awkward work in getting rid of much fallen material is obviated. There is of course the extra labor involved in setting up the bars, but it costs less than removing the broken rock night after night, not to mention the loss of time in cutting. Furthermore, if this work can be accomplished during the daytime and so does not interfere with the cutting time of the machine.

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Coal on Island of Bornholm

It has just been reported, says *Commerce Reports,* that coal in some quantities has been discovered on the island of Bornholm, which is not far from the coast of southern Sweden, but which is a possession of Denmark. It is probable that the presence of coal on this island has been known for some time, but its commercial exploitation has been retarded by the competition of other European fields.

Because of the war this competition has for the time being lost its force, and two Danish geologists and a Swedish mineral surveyor have proceeded to Bornholm to look into the possibilities of the new field, with special reference to marketing the fuel should it prove suitable for railway and industrial use. The deposits are said to be a short distance from Ronne, the chief town of the island.

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Preparing Typewritten Matter for Blueprinting

It is often desirable to blueprint a typewritten sheet. By making use of a simple but little-known kink, this can be satisfactorily accomplished. It is almost impossible to get a satisfactory blueprint from an ordinary typewritten sheet; but if, when the sheet is being written, a piece of carbon paper is put behind it so that the carbon transfers to the back of the paper, the typewritten sheet will give a perfect blueprint. This is because the impression of the typewriter ribbon is reinforced by the carbon on the back, neither one being heavy enough alone to give a satisfactory print.—*Engineering and Mining Journal.*

Observations and Experiences in Mine-Inspection Work

By J. J. Rutledge*

SYNOPSIS—Permissible explosives required in mining coal on Indian lands in Oklahoma. Accidents due to shooting long holes, rapid firing, careless tamping and overcharging of holes and numerous other causes arising from neglect or ignorance of the miner. The practice of firing "cracker shots" condemned. Accidents occur more frequently on Saturdays than at other times.

The Southwestern District of which I, as district engineer for the U. S. Bureau of Mines, have charge consists of the states of Texas, Arkansas, Oklahoma, Kansas, and southern Missouri. So far as accidents are concerned, we have little trouble in Arkansas, and scarcely any in Missouri, but one or two accidents having occurred there during the past year. Most of the calls for rescue work, or for investigations of mine accidents, come from the Oklahoma and Kansas coal fields. I will briefly mention a few observations that I have made in these coal fields.

By far the greater portion of the coal produced in the two states last named is shot off the solid with black blasting powder. It may not be known to all that the Secretary of the Interior issued an order, which took effect recently, requiring the use of permissible explosives in all mines on Indian Lands in Oklahoma, but providing the alternative of using black powder for shots fired by electricity from the surface, after everyone had left the mine. It was in compliance with this order that recently an examination in detail was made of all mines on Indian Lands in Oklahoma. These mines are on the segregated Indian coal lands, and the leases are made with the coal-land trustees of the Choctaw and Chickasaw Nations. Each lease stipulates that the Secretary of the Interior may, at any time, issue regulations governing the operation of the mines. Of course these regulations always recognize the police powers of the state. In making the examination, the following dangerous practices were noted:

Shooting Long Holes and Rapid Firing

One of the most frequent of these practices that have resulted in trouble is the shooting on the solid of extremely long drillholes. One foreman was heard to remark, "That long hole pulled that time; next time I'll try a little longer one and give it a little more powder. Then, I'll just have to set my post up the one time, while if I drill shorter holes I must make more set-ups, which makes extra work."

A second great cause of accidents has been the extremely rapid firing of the shots. Most of the recent disasters were caused by undue haste in shooting holes. In some instances 45 to 50 shots have been fired in as many minutes. On a pitch of anywhere from 15 to 35 deg. and, in some cases, even 60 deg., it is difficult to imagine how a shotfirer can get around fast enough to fire so many shots in so short a time, much less to tamp and fire them.

Another source of trouble has been the careless tamping of shots. There is little or no restraint on the manner of tamping. The Oklahoma law requires that all shots shall be tamped by the shotfirer, after every other person has left the mine. Quoting literally from a good authority: "The shotfirer, in many instances, has confidence in certain miners and, in some cases, allows the miner to tamp the shots for him, in order to lessen his own labor. Another trouble is that the 'dummy' filled with tamping, or stemming, which is provided by the miner is often not used by the shotfirer, but thrown into the gob instead. If a dummy is broken the shotfirer will not use it and does not stop to make a new one."

Another trouble is that resulting from two shotfirers firing shots on the same run. If an explosion occurs, or a windy shot, or a gas ignition, generally both the shotfirers are caught and either severely injured or killed by the accident. The shotfirers should each have separate runs, so that should an accident occur on one run it will probably not harm the man on the other run. The use of slack dummies, or dummies filled with coal drillings, has also resulted in accidents, the dust and fine coal in the dummies propagating the explosion or flame from the black powder.

Shooting with or Ahead of the Air

Still another trouble is firing shots advancing *with* the air current instead of against it. This practice should be prohibited. In some instances, several shots have been fired at one time, and disasters frequently result, especially in narrow places. Still another trouble has been caused by premature explosions resulting from the use of short fuses. Recently, several shotfirers have been burned and injured by premature blasts, resulting from the ignition of gas and the consequent lighting of the fuse and the firing of dependent shots, in advance of the opening shots.

Another cause of accident has been the firing of a "split shot," or a shot that is made by drilling a hole into a mass of coal that has been cracked and shattered by a previous shot. Frequently a hole is drilled under these circumstances and charged with black blasting powder. A number of accidents have resulted from this cause. People who are well informed on the subject state that the average life of a shotfirer in Oklahoma is two years. I think it was Mr. Wilson who advocated, a few moments ago, the certification of shotfirers. It would seem from what I have just said that the less intelligence the shotfirer possessed the better fitted he would be to fire shots under some of these conditions.

Another trouble is shooting ahead of the air. Often there is a room-neck or a crosscut containing standing gas, and a windy shot occurs in the entry inby of these places and ignites the gas and the shotfirer is burned, usually fatally, before he can get out of the place. An additional cause of accident I have noticed in the Southwest is the use of short-cuts by the shotfirer, when making his rounds.

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*Proceedings of the eighth annual meeting of the Mine Inspectors' Institute of the United States of America, held at St. Louis, June 8-11, 1915.

Sometimes a room has been driven through from one entry to the entry above or below, and the shotfirer goes through these rooms in order to shorten the distance he has to travel. This haste does not give the gases generated by the firing of the shots time to dissipate; nor does it allow the fine coal dust stirred up by the force of the explosion sufficient time to settle and, in this way, contributory causes to an explosion are created.

Shotfirers should not use these short-cuts, but should follow the courses taken by other mine employees when going through the mine workings. There will be time enough, then, to allow for the cooling of the gases liberated by the explosion and the settling of the fine coal dust. The Oklahoma mining law provides for a good system of telephones, and I am glad to say that this law has been universally enforced. It has been suggested and one or two of the inspectors have instructed their shotfirers to use these telephones in the entry to notify the engineer on the surface of the progress of their work. There is always someone on duty on the surface when the shotfirer is at work, whom he can inform when he starts firing on an entry and again when he has completed the work in that entry. Then if anything happens to the shotfirer those on the surface who go to his aid know where to look for him. At times, the entire mine workings have been searched before the disabled shotfirer has been found in the least expected place. The telephones are in the mine, in compliance with the law, and they should be used for the purposes intended. About a year ago an injured shotfirer reached a phone in his entry, called for help and, receiving prompt assistance from the surface, was soon in the hands of the doctor.

Failure to Test for Gas Before Firing

Frequently, shotfirers fail to carry safety lamps to test for gas and, as a result, are burned by walking into a body of gas with a lighted open lamp on their head. Recently, a shotfirer working on a pitch of about 55 deg. went into a room, the face of which was a slight distance ahead of the air. Neglecting to make a test, he ignited the gas with his naked light and, in trying to get out of the way of the burning gas, fell down the pitch. This man was more hurt by the fall than by the slight burns he received.

In the Kansas coal field, during the past winter, we had one shotfirer who, in two months' time, had three buddies killed while they were firing shots in the mine with him. In each instance this man has escaped uninjured while his pardner has been killed. An interesting incident that occurred in Kansas I will mention here was the escape of a shotfirer wearing a self-rescue breathing apparatus which he had fitted on his face and was using while at work firing the shots. He reported that the self-rescue apparatus undoubtedly saved his life. The "buster," or "opening," or "A" shot, when coal is shot off the solid, has resulted in small explosions, and this danger was recognized in the orders of the mine inspector and is now prohibited by the mining law.

Speaking of mining law, I desire to mention a remarkable condition that I found in Oklahoma. One of the first things I did after reaching that field was to codify the mining laws of Oklahoma. There were some four or five regulations, which were enforced by the mine inspector and which I assumed were in the mining law but could not be found when this codification was completed. One of these regulations is the requirement of safety chains on man-trips. Another is the requirement that the mules be taken out of the mine at night. These were good measures. I found that five or six such orders had been issued by the inspector. They had all the effects of law, but were not on the statute books and yet they were obeyed implicitly.

Another trouble is the "double-cracker" shot, by which is meant a hole drilled in a straight face of coal to a distance of from 3 to 6, and in some cases 10 ft. and charged in most cases with dynamite. Sometimes, these holes are 12 or 14 ft. deep. I have myself measured a breast-auger that was 14 ft. 8 in. in length. It was so long that it could not be taken around a switch without bending the auger. These holes are drilled horizontally, and, usually, in pairs, in the same vertical plane and from 1½ to 2 or 3 ft. apart. Of course, it would be dangerous to fire such holes with black powder, but the miner thinks that he is safe in using dynamite, which he thinks explodes without flame, and is not apt to ignite gas or dust. Formerly, all the shots were charged and fired with dynamite; but, recently, permissible explosives have been used instead of the dynamite, which is one of the good results accomplished by the demonstration of permissible explosives in these mines.

"Cracker Shots" Condemned

The practice of firing "cracker shots" has been long established and it would be difficult if not impossible to change it. The purpose is to crack the coal so that the miner is enabled to make a shearing with his pick more easily, at that point. Of course, it is necessary to exceed the charge limit fixed by the Bureau of Mines of 1½ lb., when firing shots of this sort; but if one cannot get a whole loaf it is better to take a half-loaf, and it is far preferable to use "permissibles" in this manner, than to fire these shots with dynamite. Permissible explosives are now almost universally used in these cracker shots.

Sometimes they use from four to six sticks of permissible powder, each 1¼ or 1¾ in. in diameter by 7 or 8 in. in length. Two or three years ago I was talking with a miner in one of the mines where there had been a very serious disaster, and asked him what amount of charge had been used in some of the very long holes. He informed me that he had used 13 sticks of permissible explosive, but added, "That was the limit." On my inquiring why he had not filled the hole to the mouth with the explosive he repeated his statement that 13 sticks was the limit. He showed, on further inquiry, that he was fully informed as to the danger of such shooting, for he stated that he would not think of firing such shots with black powder.

Use of Permissible Powder

The point I would emphasize is that when you have to deal with conditions such as I have mentioned, it is better to realize that fact and cut the cloth to suit these conditions. We have had excellent coöperation on the part of the mine operators, regarding the use of permissible powder in these cracker shots. Of course, if you adhere to the limit charge in a shot of that sort you would get no result in the amount of coal produced. We still have a little trouble with dynamite being used in these cracker shots; but, generally speaking, so far as my observations go, this dangerous explosive has been almost eliminated from Oklahoma mines.

I will refer to another curious situation that has developed. One or two mines, using permissible in the proper manner, adhering to the limit charge, and blasting the coal down in workmanlike manner after it has been undercut by a mining machine, have continued to fire the "brushing shots" in the roof, with black powder. The brushing shot is generally fired after the coal has been blasted. The permissible explosive is quicker in action than black powder and, in the immediate vicinity of the drillhole, does shatter the coal much more than black powder would. That is to say, the coal is crushed finer in the circumference of the drillhole when permissible is used, than is the case with black powder, especially, if the hole has been overcharged. To fire the black powder into a cloud of fine coal dust suspended in the air is a dangerous practice. But, in this mine, black powder was used only in the brushing of the roof, and generally only one brushing hole was fired, to each machine cut made. The old saying is that "A chain is no stronger than its weakest link." This practice was the weak link which might cause disaster in that mine, although all other operations were safe. However, the use of the black powder in this mine has recently been discontinued.

Frequency of Accidents Occurring on Saturdays

Another rather remarkable thing is the number of accidents that have occurred on Saturdays. The shotfirer is in the mine after everybody has left. He does his work anywhere from 4 to 12 p.m., and so many accidents happen on Saturdays that our men, in the danger season, never leave the rescue stations, on these days, until one or two o'clock a.m. Some of the Kansas rescue men have, as a result, reached a mine within forty minutes after an explosion. The only way that I can account for the frequency of explosions on Saturdays is that the shotfirer is in haste to complete his work on that evening.

I remember now that last July we had one on the second, and had just about completed our inquiry into that one when we had another on the sixteenth. It was the same way this season, and I believe it must be that the shotfirer is in a hurry to get out and is careless or hasty in his work. A man certainly is careless when he shoots ninety shots in forty-five or fifty minutes, as was done in a recent case of a shotfirer's explosion. Those who have fired shots know that they cannot be tamped and fired in that time.

But, I am glad to report some advances in the Kansas field; they have at the present time, certainly two, possibly three, electric-shotfiring systems. Two of these have been in use for some time. The other one, I think, has only recently been introduced. We still have in Oklahoma the electric shotfiring system, which has been in use in one mine—Alderson, 38—for four or five years. In talking with the miners in Kansas, especially the foreign-born miners, I have been interested to learn that they were nearly all in favor of the electric-shotfiring system. I could not understand the reason for this until I went below and looked over the conditions, and it seemed to be a fact that the output had increased about 100 tons per day, after the introduction of those systems. Investigation showed that a man could fire more shots than he could under the other system, as formerly the shotfirer would only fire two or three in each working place. But I think the men in Kansas lately made an agreement limiting the number of shots to three in each working place when firing electrically; we have always had that rule in Oklahoma.

It is impossible to use chain mining machines on the steep-pitching seams, so that most mines are using a post-puncher machine instead, and with the use of permissible explosives, the practice is spreading. Rooms, as well as entries, air courses, and all narrow places are cut by means of a post-puncher, either overcutting or undercutting the coal, but little shearing is done. One or two remarkable and economic results have obtained from the use of the post-puncher. In overcutting, the drawslate has been cut out by the use of this machine, and the cutting has been thrown into the gob. It has been found, after this overcutting, that the fine coal made has been clean enough for marketing without washing, and all are interested in this method of mining that avoids the necessity of washing the coal.

In some of our mines having the best discipline the superintendent requires that a shotfirer shall spend at least four hours in the mine, and this rule has reduced the number of accidents, as it requires him to take more time for his work. I have operated mines, in times past, in the Springfield district, in Illinois, and I think that is the most suitable coal I have ever found for shooting off the solid. To my knowledge, there are some of the grandsons of the old original miners that are now mining there. But shotfirer's accidents are rare in that district. However, I am not so strong for solid shooting as formerly. I have given these few rambling remarks drawn from my own experience in the last two years and a half, in mines on the Indian lands in Oklahoma.

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Cutting Out the Mica

It has been found from experience that in many cases the sparking of motor commutators can be prevented by cutting out a part of the mica insulation between the bars. A V-shaped slot is cut, the bottom of which is about $\frac{3}{32}$ in. below the surface of the copper, while a thin strip of mica is left at each side. The leaving of this strip of mica at the side of the slot prevents the formation of an electrical connection between adjacent bars by any accumulation of carbon or other material in the slot.

There seems to be a tendency in some cases for the mica to wear down more slowly than the copper, and if this occurs there will be sparking. This should be stopped by cutting out the mica as suggested.

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An Application

Among a number of applications received recently by a large coal-mining company was the following orthographic gem:

Sir: I have bin informed by the Engr. Agency that you are in need of a Transetman. I would like to accept a passisian of that kind if you think me caperable of holding the passion.

I have had Six Years experence in R.R. Const. and Loc. and am a fairly good drausman and have bin in mines with Mineing Engr. good many times. Can furnish you with rep. if need to. Yours Verry Truly,

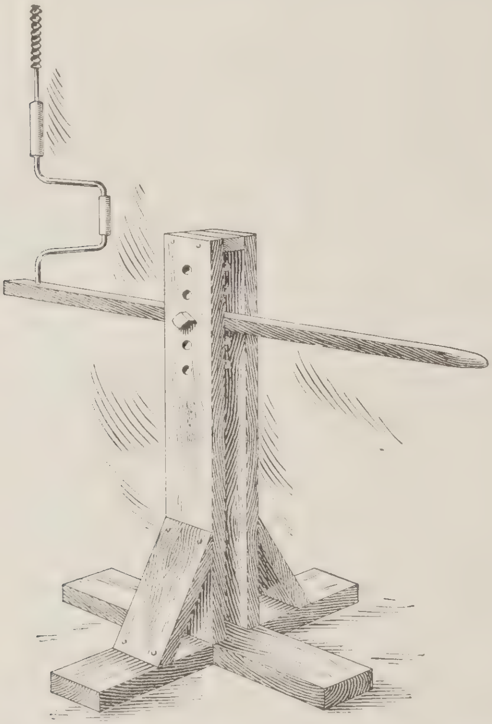
P. S. Can report in verry Short notice 5 days.

A Home-Made Boring Jack

By Sim C. Reynolds*

It is frequently found necessary in mine work to drill vertical holes in the roof. For the spads in engineering work a brace and bit will usually suffice where the hole to be drilled does not exceed ½ in. in diameter and 3 or 4 in. in depth.

But where wider and deeper holes are required for the insertion of trolley hangers, signal or telephone wires or any wiring that has to be hung from the roof, the drilling of such holes is sometimes a difficult task by the ordinary method. This is particularly so when the roof strata are flinty or extra tough, and the strength of two men is often required to do the work. Under many conditions it is even then an exceedingly slow process. These considerations in part prompted the designing of the device shown in the accompanying illustration. This simple arrangement has been found quite efficient for the work intended.



A SIMPLE AND EFFICIENT BORING DEVICE

As the illustration shows, the device is built on the lines of the ordinary lever-jack, and while it requires two men to do the work, one at the drill and the other at the lever, this is largely compensated by the extra speed with which holes may be forced in. Furthermore, if properly constructed the device may be easily moved from place to place, one man being able to carry the outfit. This is a decided advantage when drilling is to be done in a roadway where hauling is going on.

Holes closely bored in the uprights and lever and protected by metal bushings to prevent undue wear, with an efficient and easily removed cotter-pin, obviate any possible difficulty in driving the hole reasonably straight. The occasional easy adjustment of the lever in or out, up or down, as the needs may require, neutralizes the natural tendency of the pressure point to describe an arc and thereby prevents the bit from "binding" in the hole.

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*Houston, Penn.

Naval Coal Requirements

That probably 200,000 tons of coal a month would be required by the navy between Panama and Manila in time of war and that this would have to be either Pocahontas or Welsh was set forth by Capt. A. P. Niblack, U. S. N., before the Society of Naval Architects and Marine Engineers. Captain Niblack's paper was a plea for preparedness.

Assuming that a fleet consisting of 30 battleships, 20 of our largest cruisers, 40 destroyers, 20 colliers, 3 supply ships and the fleet repair ship "Vestal" made a leisurely voyage from Panama to Manila by way of Honolulu, Midway and Guam, a distance of 10,000 miles, Captain Niblack calculated that the fleet would consume 18 tons of coal and 3½ tons of oil per mile going at a speed of only 10 knots, or a total of 202,000 tons of coal and 36,800 tons of oil. In addition it is estimated that the fleet would be in port a total of 30 days and that it would consume 1,000 tons of coal and 160 tons of oil daily, making a total of 30,000 tons of coal. In his paper Captain Niblack presented the following tabulation:

	Sea Miles	Coal	Oil
Panama to Magdalena	2,265	49,000	8,500
In port 5 days	....	5,000	800
Magdalena to Honolulu	2,543	55,000	9,500
In port 5 days	....	5,000	800
Honolulu to Guam via Midway	3,450	74,700	13,000
In port 10 days	....	10,000	1,600
Guam to Manila	1,542	33,500	5,800
In port 10 days	....	10,000	1,600
Total	10,000	242,200	41,600

To show the amount of fuel left over at the end of the voyage Captain Niblack said: "Taking from the Naval Pocket Book the bunker capacities of all the ships enumerated as comprising this fleet, adding to it the carrying capacities of coal and oil of the 20 colliers and comparing the sum with the consumptions of fuel in the foregoing table, we have, in tons:

	Coal	Oil
In bunkers	129,000	16,900
As cargo	120,000	38,100
Total	249,000	45,000
Consumed as per table	242,200	41,600
Margin	6,800	3,400

"The margin remaining as shown is uncomfortably small, and we are at once confronted with the problem of the 240,000 tons of coal and 40,000 tons of oil required to get the ships back to Balboa. The bunker coal for the colliers can be obtained from Singapore or Australia, but only Welsh or Pocahontas coal serves for naval use. The problem, elementary as it may seem, is extremely complicated even in time of peace. What it would be in war is another matter, but it illustrates the profoundly gratifying fact that we have wisely given our ships a large steaming radius and, more wisely still, have gone in for government-owned colliers and supply ships, while every other navy in the world has to rely on chartering. With adequate supplies of coal and oil at Honolulu, Midway and Guam, we may attain the desired mobility of the fleet even in war, provided we adequately fortify Guam and Midway.

"In time of war the high speeds required in scouting and protecting would increase enormously the demand for fuel, and the 10 knots' speed for the fleet shows how narrow is the margin, as it gives the minimum easily increased by leaps and bounds under stress of weather or war operations. It is estimated that probably 200,000 tons of coal would be required along this route in wartime."

Change of Railroad Rates in West Virginia*

By J. W. Dawson†

SYNOPSIS—The freight increase in West Virginia is for the purpose of relieving the railroads from the necessity of reducing freight rates in Ohio. The writer alleges a conspiracy of the Pennsylvania R.R. and the Pittsburgh Coal Co. against the West Virginia operators.

The proposed change in freight rates is the greatest crisis that has ever confronted the State of West Virginia. It will involve each year more than the Virginia debt, and yet that has been regarded as a critical matter for the state. The coal produced in West Virginia is 50 per cent. more valuable than the agricultural products of the state, and the coal industry annually brings into West Virginia about half as much money as is on deposit in all the banks of the state combined.

The panics of 1907 and other years were caused by a fear on the part of the banks in one section that they would be unable to get any more cash if they let out what they had on hand. If that is true, what would happen if they knew 50 per cent. of their deposits, $75,000,000 annually or $250,000 daily, would be cut off next year; yet this is the amount that the coal industry brings to West Virginia, and the shutting off of this inflow of money would create such a panic as has never been seen or dreamed of in this state.

What Idle Mines Would Mean to West Virginia

But the crisis does not confront only the 450 coal companies, but also in as large or larger degree the 80,000 mine laborers, the 250,000 women and children who are dependent on them, laborers in all other walks of life, the farmer and his laborers, and the wholesale and retail merchants. It will even affect the state by reducing the revenue from taxation.

The 450 coal-operating concerns will be injured to the extent of $5,000,000; the miners and their families will lose $55,000,000, or 11 times as much as the operators. About 95 per cent. of the $75,000,000 for which the coal of West Virginia is sold comes from without the borders of the state. If the coal industry of West Virginia should be destroyed and the railroads of the state thereby lose their largest tonnage and revenues, will not the merchant and manufacturer be required to pay higher freight charges on his wares? And will not passenger rates be advanced likewise to make up the deficit to the railroad?

If West Virginia could have freight rates as favorable as Pennsylvania in marketing her coal, the coal lands of the former state would not then be only worth from $100 to $200 per acre while lands in Pennsylvania, containing less valuable coal, are valued at from $1,500 to $2,000 an acre. The valuation for taxes in West Virginia would after the change be about $2,000,000,000 instead of $1,250,000,000.

Now what threatens the very existence of this business? Not the proposed 15c. advance in freight rates. That is only the last straw that may break the camel's back. The real danger that threatens the state is the illegal combination of railroads and coal operators and coal miners of other states, which has done for years and still is doing everything it can to destroy the coal industry of the state and will, through it, destroy other business in West Virginia.

When the 200,000 or more coal miners and thousands of coal operators of Ohio, western Pennsylvania, Indiana and Illinois meet each two years to discuss wage agreements, much time in their deliberations is devoted to ways and means of "destroying West Virginia's coal industry," and no mention is made of destroying that of other states. This is a matter of record in the printed proceedings of their conventions.

Pennsylvania Operators Desire to Close West Virginia Mines for 50 Years

A few years past one of the principal officers of the Pittsburgh Coal Co. testified before the Interstate Commerce Commission in the lake-rate cases, known as I. & S. No. 26, that "the opening of the West Virginia coal mines was an economic blunder and should have been postponed fifty years." In this he voiced the sentiments of the officials of the Pennsylvania R.R. and most coal operators of western Pennsylvania, Ohio and Indiana, and they will, if they can, close our coal mines for the next fifty years.

Some years past the president of the Norfolk & Western Ry. called into his office the coal operators along his line and told them bluntly that they must increase the price of coal 25c. a ton at the mines or he would increase the freight rate 25c. a ton to Atlantic Coast points for the reason that they were shipping too much coal into New England via Lamberts Point and Atlantic Coast vessels and that they were taking the business and tonnage formerly handled by the Pennsylvania R.R.[1]

You will observe no consideration was given to the coal industry of West Virginia or the earnings of the Norfolk & Western Ry., but that the anxiety was to protect the business and earnings of the Pennsylvania R.R. None of us will, I believe, think that the Norfolk & Western Ry. would take such action voluntarily.

Then, about the year 1901, W. M. Page, one of our largest coal operators, desiring to develop valuable coal lands and wishing to have some of his associates in either Baltimore or Philadelphia test the coal, loaded a car of it and billed it out over the Chesapeake & Ohio Ry., and that common carrier refused positively to move this car forward at any price, for the reason that the Pennsylvania R.R. did not permit the Chesapeake & Ohio Ry. to handle coal routed into Eastern cities.

I am wondering if you are conversant with the fact that neither today nor at any previous time in a great many years can coal mined along the Chesapeake & Ohio

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*Abstract of paper read before the West Virginia Board of Trade, Fairmont, W. Va., Oct. 19 and 20, and entitled "The Coal Crisis."

†Charleston, W. Va.

[1] The president of the Norfolk & Western Ry. Co. in his letter of Nov. 27 emphatically and unequivocally denies having made this statement.

Ry. in West Virginia be shipped into Baltimore, Philadelphia, New York or intermediate cities where it should find the best markets. Not for the reason that the distances are too great. This coal does move into Detroit, Mich., Chicago, Ill., and Minneapolis, Minn., which distances are just as great. Not for the reason that we cannot market coal in territory nearer other coal fields, for West Virginia coal is marketed in and through the coal-producing states of Ohio, Indiana, Michigan and Illinois. But the only reason why our coal cannot be marketed in the Eastern cities is that influence is exerted over the railroads in West Virginia by the Pennsylvania R.R. and its associates to such an extent that our railroads are not permitted to do business where that business will affect adversely the tonnage or earnings of the Pennsylvania R.R.

About the year 1900 the largest railroads, acting with the large coal companies of Pennsylvania, Ohio and Indiana and other large financial interests, directed the principal coal roads of West Virginia to stop by force the development of coal properties in our state, and this policy was undertaken by the roads of West Virginia between the years 1900 and 1904, by tearing sidetracks away from coal tipples, arbitrarily refusing car supplies, refusing car track and switch connections for new developing mines and by other equally illegal methods until the people became so wrought up and so many complaints had been made to the Interstate Commerce Commission and to the courts that the Pennsylvania R.R. Co., the Pittsburgh Coal Co. and others in this illegal combination realized the necessity of discontinuing for the time being those high-handed practices.

A Conspiracy to Cripple by Freight Rates

Then, a few years later, this illegal combination finding that it could, and had for years, kept West Virginia coal out of the Eastern cities, conceived the idea of forcing the West Virginia railroads, against the will and judgment of their operating officers, to increase freight rates on coal to the Great Lakes "for the purpose of keeping West Virginia coal out of the Western market." This question was appealed to the Interstate Commerce Commission, with the result that the efforts of the illegal combination were again frustrated.

Now this same combination, believing that the "pendulum had swung back" in favor of permitting railroads to do as they pleased, has mapped out a plan by which it hopes to force West Virginia railroads to apply such unreasonable charges for the handling of our coal that it will be impossible to market our product in competition with Ohio, Indiana and western Pennsylvania.

And in this connection it seems to me the trunk-line railroads are determined not to permit the Department of Justice of the United States or the various state administrations to give them a rest, for it seems that as soon as the public begins to talk in favor of fair treatment of the railroads, the railroads in turn begin the unfair treatment of the shipping public, as in this case.

We should have no quarrel with the coal operators of western Pennsylvania and Ohio for attempting to have their coal rates reduced if they thought them unreasonably high nor with the Pennsylvania R.R. for keeping its rates up if it can, but when these two interests combine to force up West Virginia rates, which are satisfactory both to West Virginia coal producers and West Virginia railroads, it is high time to fight the increase.

When a few years past the destruction of the coal industry of Ohio was threatened by unwise legislation, the people of Ohio remained indifferent and the "Green anti-screen law" was passed. Then the Ohio railroads, realizing that they might be compelled to lower freight rates, combined with the coal operators of Ohio and western Pennsylvania, and proposed to save the situation by an increase of freight rates on coal shipped from West Virginia. Until then the railroads of West Virginia had not thought of raising freight rates or complained of their being too low.

As an evidence of the fact that the present move to destroy the coal industry of the state is not one involving rates on coal or profits or earnings of West Virginia railroads, or one originating even with the officials of those roads, let us see just what led up to the present proposed demand for higher rates on our products.

Conference at Which Increase Was Planned

A few weeks past an operating officer of the Pennsylvania R.R. and the legal representative of the Pittsburgh Coal Co. arranged with a member of the Interstate Commerce Commission for a conference between them and a "few friends." When the date set for the conference arrived, I am told, there appeared before the Interstate Commerce Commission 11 railroad officials, representing the Bessemer & Lake Erie R.R., the Baltimore & Ohio R.R., the Cincinnati, Hamilton & Dayton Ry., the Chesapeake & Ohio Ry., the Hocking Valley Ry., the New York Central & Hudson River R.R., the Norfolk & Western Ry., the Wheeling & Lake Erie R.R. and the W. P.[1]; 7 coal operators representing western Pennsylvania, 4 from the No. 8 District of Ohio, 2 from the Hocking Valley District, 2 from the Pomeroy District; and 27 or more other railroad officials and coal operators of Ohio and western Pennsylvania.

And they met, not with a view of adjusting freight rates on Pennsylvania or Ohio coal or on the Pennsylvania R.R., but to have the rates on West Virginia coal increased.

These gentlemen by argument or written petition attempted to prevail upon the Interstate Commerce Commission to take such action as would increase the rates on coal from West Virginia without increasing the rate on coals from other states, giving as their reason for this action that it was their desire to bring about a condition of affairs that would give to the coal operators and the railroads of Pennsylvania and Ohio better markets and greater profits and prevent West Virginia coal from being profitably mined north and west of the Ohio River.

It should be borne in mind that at this important conference no West Virginia coal operators were invited or were present, even though it was their business and theirs alone which was under consideration.

It should likewise be borne in mind that this conference of the Interstate Commerce Commission did not originate with, nor was it requested by, the representatives of any railroad of West Virginia or any coal operator of West Virginia, but by an attorney for the Pittsburgh Coal Co. and a vice-president of the Pennsylvania R.R. and of the New York Central & Hudson River R.R., thus showing conclusively that the combination was acting in opposition to the interests of West Virginia.

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[1] Possibly by W. P. is meant the West Maryland Ry.

The petition filed with the Interstate Commerce Commission states plainly and shows conclusively that the object of these gentlemen and that move were not to benefit the railroads of West Virginia, but to destroy the coal industry of the state and to cripple hopelessly the railroads of West Virginia.

The Ohio operators, taking advantage of the depression in the coal business during the past year, demanded of the railroads and through the Ohio Corporation Commission[1] a reduction in freight rates on coal within the State of Ohio, giving as a reason that the operators of Ohio could not do business in competition with West Virginia operators under present freight rates, notwithstanding the fact that those rates have been in effect in Ohio and western Pennsylvania for a great number of years and that the year 1913 was conceded to be one of the most profitable years to the coal operators and coal industry of that state.

Moreover the production of coal within the State of Ohio has increased under those rates from 18,988,150 tons in the year 1900 to a tonnage of 36,200,527 in the year 1913, or an increase in 13 years of about 90 per cent. This shows conclusively that the coal industry of Ohio was developing satisfactorily until the "Green anti-screen law" was passed by the Ohio Legislature during the winter of 1913. As I have already said, this law put the coal operator of Ohio out of business.

The operators of western Pennsylvania and Ohio set up the plea that it is necessary to increase freight rates on West Virginia product that they may receive a reasonable price for their coal at the mines, but under the present freight rate and transportation conditions which have existed for years the operators of Ohio receive about $1.09 for their coal at the mines and those of western Pennsylvania about $1.12 per ton, while the operators of West Virginia obtain for a much higher grade of coal only about $1.03 per ton, which would not indicate that it was necessary in the interest of fairness to establish a greater differential in the freight charges on coal mined in these several states.

If the controversy now confronting us was one of railroad revenues or earnings and if the railroads of West Virginia actually needed or claimed that they require additional revenue, the question would be entirely different, but the officials of our railroads would not dare to make any such claim in face of their official reports which have recently appeared in print and which show conclusively that they are earning good profits on their investments.

Railroads in West Virginia Are Making Profits

Their stock has increased in value many hundred per cent. in the space of a few years; for instance, the stock of the Kanawha & Michigan Ry. was purchased and sold at about 11c. about 16 years ago, while now it is worth and brings on the market about 88, an 800-per cent. increase in value in 16 years, or 50 per cent. a year. I know of no coal company or other enterprise in the state making such a showing. With the Kanawha & Michigan and Chesapeake & Ohio showing a good net earning on stock that represents no original investment and the Norfolk & Western Ry. showing a net earning of about 8 per cent. on stock that was sold and purchased at five and six dollars a share and now sells for 117, West Virginia railroads could not and do not claim they must have higher rates for necessary revenue. The proposed increased rates must therefore be for some other reason.

If by chance the coal operators of West Virginia could continue doing business under this advanced freight rate, it would be necessary for them to decrease the amount of wages paid their employees and curtail expenses in every other way to absorb this 15c. advance in rate. Thus if they continue to ship coal in the same quantities as at present, there would be an annual loss to the state of this 15c. a ton, or about $11,000,000 annually, so long as this advanced rate was in effect. For the operators of West Virginia do not have it in their power to require the users of West Virginia coal to pay the additional freight charge, as they have no control over the price at which their coal is sold either at the mines or at destination, that being determined entirely by the price at which the customer can purchase coal mined in western Pennsylvania, Ohio and Indiana.

It should be borne in mind during the consideration of this entire matter that it is in no sense a controversy between the coal producers of West Virginia and the railroads of West Virginia, but the contest is really between the State of West Virginia and all its citizens on one side and the Pennsylvania R.R. and the coal operators of western Pennsylvania and Ohio and the State of Ohio on the other side. Therefore every man within West Virginia should enlist in the battle.

West Virginia Selling Coal at Low Prices

It is because of the illegal and criminal combination that West Virginia operators are forced to sell at the mines the best coal in the world at the lowest price in the world. No one will claim, I believe, that this is done voluntarily by West Virginia operators or that they are less aggressive, less intelligent or less capable of coping with market conditions than the operators of other states, but notwithstanding their ability and efforts, their high-grade coal was sold last and previous years at prices which netted West Virginia something like $8,000,000 less than they would have received for the coal shipped out had they been permitted to market their coal under as favorable conditions as some of the other states, which are now claiming that they are discriminated against by the railroads in favor of West Virginia, which is not true.

I believe this board could not do anything which would benefit the State of West Virginia as much as to employ the best attorney obtainable, who would appear for and in the name of the Board of Trade of West Virginia before the Interstate Commerce Commission and defend this state against this great injustice, and further appear before and demand of the Federal Department of Justice an investigation into this entire question and a prosecution and a conviction if possible of the individual men connected with the Pennsylvania R.R., the Pittsburgh Coal Co. and others for their attempted illegal restriction of the commerce originating in West Virginia and passing into other states.

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[1] Ohio Public Utilities Commission.

Anthracite Section A. I. M. E.

The Pennsylvania Anthracite Section of the American Institute of Mining Engineers held its fall meeting in Scranton in the clubhouse of the Engineers' Society of Northeastern Pennsylvania on Dec. 4. H. M. Crankshaw, general manager of the Harwood Coal Co., presented a paper on "Mining and Ventilating Thick Pitching Seams." In this he described the methods of working the Mammoth bed which he has introduced at the Harwood colliery and which give a reduction in the cost of extraction, a larger percentage of prepared sizes and an increased recovery.

William Griffith gave a description of the results of tests of models of the mine-roof supports developed by him. These consist of timber cogs filled with concrete. They show great strength and elasticity.

Hugh Archbald exhibited a chart showing the results of some of his investigations into the loss of time at collieries. An investigation of one colliery, extending over a month, showed that the majority of delays in the forenoon were caused by inside troubles, while in the afternoon the larger part of the loss of time was owing to delays in the breaker.

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Freight Congestion at New York

What effect the freight congestion that is enveloping the New York tidewater will have on the coal situation is as yet uncertain, but there is no division of opinion that should the Atlantic coast be visited by severe winter storms the trade will be facing a serious shortage of coal. It is estimated by railroad officials that there are more than 40,000 cars of freight lying on the sidings of the various roads leading to New York. Most of this freight is for export and is held back by the shortage of vessels. Among it are many cars of coal consigned to New York and Philadelphia. It is estimated that one of the large anthracite carriers alone has about 500 cars among the number, and it was also said that about a week ago the Pennsylvania R.R. had 1,800 cars on side tracks waiting an opportunity to move. Shipments along the Baltimore & Ohio were said to be quicker than on some of the other roads.

Shipments from the hard-coal regions, usually requiring an average of three days, now take upward of two weeks. It was also said that some cars of hard coal had been delayed two weeks, although the coal had been for several days within 50 mi. of New York. Shippers of bituminous complain of having boats waiting at the docks for coal. Delay on shipments of soft coal is generally greater than that on hard coal.

Efforts are being made by the railroads to relieve the situation, and to that end a meeting of the presidents and vice-presidents of the railroads reaching New York, Boston, Portland, Philadelphia, Baltimore and Newport News took place in New York last week. The conference appointed a committee of operating officials to deal with the situation. It will seek the coöperation of shippers as well as steamship companies to expedite the movement of export freight.

A committee representing the exporters of the city has also been formed and will confer with the railroad representatives. This committee will make a formal protest to the railroad representatives against the filing of the notice with the Interstate Commerce Commission that on and after Jan. 1, 1916, the number of days of free storage will be reduced from 30 to 15 days.

Embargoes have been declared by the Delaware, Lackawanna & Western on eastbound freight intended for export, except shipments for which vessels have already been engaged, by the Pennsylvania on all flour and lumber for export or to be lightered at New York and by the Baltimore & Ohio on all iron and steel products for export at New York. In addition it is expected that other roads will inaugurate similar embargoes.

How the railroad officials view the situation is set forth in an address made by George Dallas Dixon, vice-president in charge of traffic of the Pennsylvania R.R., made before the International Trade Conference at the Hotel Astor on Dec. 6, when he said:

> The export freight situation which has suddenly developed at the Port of New York is far from satisfactory to the railroads, to shippers and the country generally. The export traffic in the past has grown by leaps and bounds until every transportation company, both rail and water, has found itself unequal to the task of handling it satisfactorily. What will be the situation six months from now if this traffic continues to grow as it has in the past few months? And certainly it is reasonable for us to suppose that it will continue to grow possibly even more rapidly. The American nation must stand ready to help supply the markets of the world, but if we are to do this, we must be prepared.

It is estimated by C. C. McCain, chairman of the Trunk Line Association, that of the 40,000 cars either at the terminals or on the lines consigned to New York, approximately 90 per cent. will require lighterage delivery. Mr. McCain said that no figures that had been submitted showed the number of cars loaded with coal lying between New York and the coal regions.

The Pennsylvania, in a statement issued on Nov. 30, said that at various points in New Jersey there were at that time 2,746 cars of freight for export and lighterage at New York. The Lehigh Valley on Dec. 2 reported having at the New York terminals 3,970 cars of freight undelivered, of which 3,580 cars were waiting for ships. Of these latter, 1,372 cars were unloaded, the contents of 2,014 cars were being held on piers and in warehouses and that of 194 cars had been unloaded on the company's property in Jersey City.

Under date of Dec. 7 the L. V. R.R. issued the following statement:

> The Lehigh Valley R.R. has placed an embargo on shipments of the following commodities consigned to New York harbor delivery: Export, domestic and coastwise shipments of hay and straw. Export, domestic and coastwise carload shipments of wire of all kinds, nails of all kinds, iron and steel rails. Export and domestic carload shipments of locomotives and parts thereof, machinery and all iron and steel articles. Shipments of the foregoing will be accepted which are billed before Dec. 7.

The C. R.R. of N. J. at the same time announced:

> The Central Railroad of New Jersey has placed an embargo on all export traffic, also on hay and straw, and on locomotives and parts thereof, consigned to all New York deliveries. Shipments of the foregoing billed before Dec. 6 will be accepted.

The committee appointed by the railroad presidents also issued a statement under this date as follows:

> The representatives of the several roads advised that there had been an increase of from 400 to 600 cars on their respective lines or at their terminals, as compared with the conditions at the time of the previous meeting. It was ascertained that the embargoes which had been previously announced had relieved certain of the roads only to a limited extent and that the situation as a whole had not been improved and that additional embargoes had been found necessary by the Lehigh Valley R.R. and the Central Railroad of New Jersey.

The Labor Situation

SYNOPSIS—The Rochester & Pittsburgh Coal and Iron Co. closes down the Florence mine as a result of the strike. In Illinois the union decides that the exclusion of militiamen from the mines and the union is unconstitutional. Charles S. Keith testifies at Kansas City that he paid $20,250 for the purpose of corrupting the union. The Colorado Fuel and Iron Co. publishes the list of causes for which men may be discharged without notice.

The employees of the Lawrence and Stanton collieries in the anthracite region, comprising about 1,000 men, went on strike on Nov. 23 endeavoring to make the Harleigh-Brookwood Coal Co., a Madeira-Hill operation, accede to their demands. When the matter was brought before the conciliation board, the men were directed to return to work in three days. The men are then to present their grievance to the company, and if no agreement can be reached, the questions at issue will be heard by the board at its meeting of Dec. 6. The mines have only been in operation a short time, after being abandoned for several years.

Unions Behind in Special Assessment May Vote

The international officers of the United Mine Workers have declared that no local union shall lose its representation at the international convention in January by reason of unpaid special assessments. On Sept. 1, 1913, a special tax was laid upon all members for the conduct of the eastern Ohio and Colorado strikes. This was operative for two months, but by a referendum vote the assessment was extended and remained in force until June, 1915. Many of the anthracite unions because there was no check-off fell behind in the collection of the special assessment, which amounted to 50c. a month per capita. Some unions are behind $6,000 to $7,000, and the men in such unions are glad that their delinquency will not bar their delegates from voting.

The Lehigh Coal and Navigation Co. discovered that Charles Novak, a breaker boss, was selling jobs to foreigners for work under his supervision. He was fined $50 and sentenced to one year's imprisonment.

Some of the workmen having refused to join the union, 1,000 men in the Beaver Meadow colliery of the Lehigh Valley Coal Co. refused to work with them, and the mine closed down in consequence. After being idle two days, the men agreed to return to work pending an adjustment of the matter.

Florence Miners on Strike Are Locked Out

The strike of the men of the Rochester & Pittsburgh Coal and Iron Co. at Adrian and Florence, referred to in the preceding issue of "Coal Age," still continues. On Nov. 30 Lucius W. Robinson, the president, posted a notice at Florence stating that as the men had gone on strike Nov. 22 he would not attempt to operate the mine during the winter. He called on the men to remove their tools. Mr. Robinson recalls the fact that on the signing of the scale agreement of 1912 the Florence employees refused to work under that instrument for several weeks.

The men get much comfort out of the fact that the company declares it is losing $500 to $1,000 a day each day the mines remain idle. They think it is vain for the company to hope that this money will be refunded by the union or the men, and they believe that the assurance of continued loss will make the R. & P. C. and I. Co. anxious to settle. J. P. O'Loughlin, of Clearfield, is the final umpire if the case is submitted to arbitration as the agreement requires.

Attitude of Union to Militia in Illinois

The law forbids any discrimination against men who belong to the state militia. Recently five men were expelled from Local Union 644 for membership in the militia of Illinois, one of the men being a local secretary of that union. This was done under the district constitution, Sec. 26 Art. 14, which states that "any member belonging to a secret-service organization, a private detective agency, the Boy Scouts, the Civic Federation, state militia or National Guard shall be expelled from the United Mine Workers of America."

The men expelled demanded reinstatement in the local, restoration to their positions in the mine and reimbursement from the union for all time lost. Frank Farrington, the president of the district, recommended that these demands be granted, but the local tabled the paper on Oct. 1. On Oct. 4 the five men caused the arrest of all three members of the mine committee and charged them with five violations of Sec. 4 Art. 23 of the Military and Naval Code of the State of Illinois.

On Oct. 16 a committee appointed by the district executive board of the union visited Hillsboro where the men were expelled and proceeded to consider the situation. It reported on Nov. 1 that Sec. 2 Art. 14 of the International Constitution read: "Mine managers, top foremen, operator's commissioners, persons engaged in the sale of intoxicating liquors and members of the Civic Federation or Boy Scout movement shall not be eligible for membership." They held that the district constitution conflicted with this provision, especially since at the first biennial convention of the United Mine Workers of America the constitution committee was asked to recommend the exclusion of militiamen from membership in the union and refused.

The committee held that Sec. 26 Art. 14 of the district constitution was null and void as far as its references to the militia and National Guard were concerned. This decision while open to much question is the best way out of the difficulty and has been approved by Frank Farrington. The committeemen declared that compliance with the law was the better plan, that the charges against the union of lawlessness could only be met by circumspection and obedience in this matter and that to violate the law would give the operators an excuse for violating it also.

Large Bribes Offered to the Union in Kansas

Alexander Howat, president of district 14 of the United Mine Workers, is pressing the suit for slander which was noted in much detail in "Coal Age," page 805. Charles S. Keith, president of the Central Coal and Coke Co., of Kansas City, Mo., testified before a commissioner that he had paid $11,250 on one occasion and $9,000 on another to obtain a favorable clause in the contract with his miners. Mr. Keith was president of the Southwestern Interstate Coal Operators' Association and paid the larger amount in 1910 and the smaller in 1912. His testimony was that the money was given by him to Joseph H. Hazen, an independent coal operator of Mulberry, Kan., for payment to Alexander Howat and Fred Holt, respectively secretary and treasurer of the Oklahoma district.

The contract clause mentioned provided for an arbitrator to pass on questions between the operators and the employees. Mr. Keith testified that H. H. Holmes, a Chicago detective, had first suggested the means of obtaining the desired clause. He then engaged Holmes to obtain it.

Mr. Keith testified that the money, given in check and currency to Hazen, was advanced by the Central Coal and Coke Co. and later paid back by the association. Testimony somewhat similar to this was given when Mr. Keith was sued at Fort Smith, Ark., by the Bache-Denman interests for an accounting of the association funds. Howat denied that he received the money from Hazen, in depositions which he gave then.

Howat's suit is directed against C. S. Keith, J. H. Hazen, W. J. Jenkins, of the Western Coal and Mining Co., Edward E. Riley and Ira M. Fleming.

Costly Blackmailing of a Miner in Oklahoma

Michael Broshears, a miner, brought suit against the Deimal Coal Co., of Dewar, Okla., which blacklisted him. He was without work from Nov. 27, 1914, to Apr. 1, 1915. The company has been ordered to compensate him for every day the mine worked between those dates. The case has been before numerous arbitration boards and commissions and was finally settled when Judge Evans, of Booneville, Ark., acting as third member of the latest board, decided in favor of the miner.

Offenses Meriting Discharge Without Notice

One of the agreements between the miners and the Colorado Fuel and Iron Co. required that the company should post a statement specifying what offenses would be punishable by dismissal without previous notice. The offenses named are violation of law, changing checks on mine cars or loading out another's coal, theft of supplies, changing working place without orders, willfully loading out slate and other impurities with coal, abuse and neglect of animals, intoxication and bootlegging, carrying detonating caps at mines where shotfirers are employed, indecent or immoral conduct, fighting, carrying concealed weapons, three days' absence without permission, except in cases of illness, and sleeping on duty.

Editorials

Contributory Negligence and Assumption of Risk

Two of the features of our common law we have always looked upon with some suspicion—contributory negligence and assumption of risk. It always seemed that if the employer was in any degree responsible for an accident, he should foot at least a part of the bill, and it appeared also that the workingman was really not always altogether aware of the risk he ran or a free agent in accepting it.

So the new Pennsylvania act removing these common-law defenses looked not by any means wholly illogical and unfair, and it had the merit of shifting the burdens onto the shoulders which were broader and better fitted to bear them. With these pious reflections most of us have been willing to admit that the operator who was little if in any way at fault for an accident should pay the whole bill.

But the Court of Appeals in New York has just reversed a decision of a lower court and has declared that when a man turned up his collar, pulled his hat down over his eyes and tried to cross the street and was run down by an auto truck, the company owning the truck should not pay for the loss. He did not use "ordinary care," they say, which is the same as saying he was negligent in a contributing manner. He also must have assumed the risk, or he would not have attempted to cross the street when express wagons were running.

So the courts revive the old common-law defenses in a peculiarly objectionable manner. No one could find fault with the courts for proving friendly to their favorite counsel, but the interesting matter is that those papers that have unsparingly condemned the common-law defenses in the mine and the mill now look upon them as judgments of Solomon—on the street.

And why? The auto-truck man can as readily avoid hitting the pedestrian as the latter can avoid being hit. The contributory negligence is nearly equal, but the pedestrian is a little less negligent than the auto-truck man, for he cannot watch the auto truck without turning his head, while the driver has a good chance to see the pedestrian, because when the two are near one another, the pedestrian is straight ahead and in full view.

In the mine, however, the negligence of the miner is usually about a thousand times greater than that of the foreman. He should be in his place about a thousand times as long and have many times the opportunity to examine the roof. It is not a case of equal negligence of miner and foreman, but of a trifling failure on the one hand and a gross oversight on the other—if of course there is any negligence at all.

Besides, neglect by the foreman even if proved is not as damnatory to the employer as his personal neglect. Negligence in supervision is always a smaller negligence by far than one in action, and if the contributory negligence rule is to be wiped out, it should first exclude cases of negligence in action like that of the truck driver and later extend to negligence in prevision and superintendence. But it appears that the public as usual uses horse-sense about its own affairs and sob-sense about the affairs of others.

The public will be a long time realizing that the same thing constitutes justice for the ordinary individual as for the mill owner and the mine operator. The failure to realize this is why domestic servants and agricultural laborers are excluded by the present act in Pennsylvania, and it explains why the whole battery of the common law may be used to break down the plea of a plaintiff injured on the public street, but may not be raised if he is hurt in a mine or a mill.

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West Virginia Freight Rates

Col. J. W. Dawson has written to *Coal Age* criticizing an editorial which appeared on Nov. 6 and declaring that it was erroneous in that it denied that the Eastern coal trade of West Virginia was threatened by the railroads. Colonel Dawson demands that *Coal Age* meet his declaration that the railroads were proposing to raise rates on Eastern traffic as well as on Western. At the time when the editorial was written Colonel Dawson's remarks in full had not arrived at the editorial desk, and the statement of the editor was based on the excellent, though not complete, brief of Colonel Dawson's paper circulated by the West Virginia operators.

But the reader of the abstract of Colonel Dawson's paper, published herewith, will see that according to his statement the threat to add 25c. to the freight rates East dates back some years. The following letter from L. W. Johnson, president of the Norfolk & Western Ry., in answer to a quotation from Colonel Dawson's communication to *Coal Age* carries its own message:

> I have your letter of the 17th instant, in which you quote a statement which you claim was made by Col. J. W. Dawson, of Ward, W. Va., as follows: "My address at Fairmont stated positively that the president of the Norfolk & Western R.R. had notified the coal shippers along his line that he would probably advance the freight charges on Tidewater business 25c. a ton to prevent their shipping coal in greater quantities into New England."
>
> If the gentleman made such a statement it is false, and I positively deny having made such a statement as I am accredited with.
>
> The shippers on the Chesapeake & Ohio, Norfolk & Western and Virginian were advised that a change in the bunker rates was contemplated, and at their request a conference was held with representatives of the three railroads. After full consideration, the shippers were notified that the proposed tariff would not be filed. This is all there is of it.

It is obvious that an increase in freights east is not now contemplated, so that the menace greater or less to West Virginia trade applies, as *Coal Age* stated, only to the coal directed west. But Colonel Dawson's fears of a general rise in freight rates east and west justify him in his apprehension that the coal trade of the whole state is threatened with restrictions, though it cannot convince him, surely, that it is approaching complete annihilation.

In fact, as recently as Sept. 13 of this year the shippers of the three railroads mentioned in Mr. Johnson's letter were advised that the roads contemplated an advance in rates from $1.40 per gross ton to $1.50 per net ton, which is exactly 25c. per 2,000 lb. ton. After a conference was held in the Philadelphia office of the Norfolk & Western Ry. it was decided by the carriers that they would not file any such tariff with the Interstate Commerce Commission.

Colonel Dawson likewise objects to the intimation that his line of argument does not receive the support of the bulk of the West Virginia operators. Our surmise that they could not approve it he assures us is incorrect and gives some evidence to prove it. So *Coal Age* is obliged with much reluctance to give up the idea that the operators do not view matters from Colonel Dawson's viewpoint.

Colonel Dawson's remarks to the State Board of Trade on the conspiracy between the railroads and coal companies are interesting. There is no reason to doubt that the personnel of the conference as outlined by him is correct. It is quite likely that the railroads feared that the attack of the Ohio operators on the freight rates in that state would result in wrecking the coal-freight trade in Ohio, which is the best business the railroads have in that and every other state. Rather than see Ohio rates reduced 30c. or 40c. per ton as looked probable, rather than face reductions in other states following Ohio's lead, the railroads probably figured with much wisdom that an increase in West Virginia rates would prove a more desirable consummation than a reduction in Ohio and elsewhere.

Possibly the Ohio operators were summoned to find if they would cease their action before the Ohio Public Utilities Commission if the West Virginia rates were increased and perhaps they agreed. No one seems to know. But certain it is that it would be better for West Virginia to suffer an increased rate of 15c. than to face a 30c. to 40c. decrease in the rates of neighboring states without any countervailing reduction in the "Mountain State."

A smaller reduction in West Virginia would probably take place if the rates were reduced as liberally in Ohio as has been indicated, because West Virginia would be driven quite generally from the market by any such differential, and the railroads of the state would have to meet the attack by lowered freight rates. So the railroads would suffer heavily in Ohio, and almost as heavily in West Virginia, because in that latter state coal is almost the only freight. West Virginia operators would not only lose trade, but the railroads would also lose in their receipts per ton of coal hauled as well as in its gross volume. Clearly the change would be helpful to no one but the consumer in neighboring states, and even he would suffer as he always does when business is done without profit.

Perhaps the West Virginia people losing the railroad earnings formerly spent in that state and losing in the declining profits of the operators also will realize that it would be better to leave the matter of the freight-rate increase where it stood. To do so will hurt only the West Virginia coal operators and not the railroads of the state. But the coal men stand to lose whether freights are raised in West Virginia or lowered in Ohio. If under the new arrangement the railroads in West Virginia are compelled to lower their freights, then both in its railroads and in its mines West Virginia will feel the effect of the lowering of the freight rates in Ohio. No wonder if the Pennsylvania R.R. estimated that this would be suicidal and preferred to see prices raised. That there was no conspiracy against West Virginia is shown in its readiness, if the report be indeed true, to raise Pennsylvania rates also so that only Ohio will profit. This will bring Pennsylvania operators who have suffered severely from unreasonable rates into the struggle. The Pennsylvania R.R. apparently is acting solely from opportunism. Ohio is wroth and must be appeased; West Virginia is demanding the present differential and must be mollified. So Pennsylvania must suffer.

It is time for Pennsylvania, not embittered or divided but not yet united, to fight for its right to mine coal and to have a ton-mile freight rate which is equitable. Pennsylvania has suffered from West Virginia competition, and now it is assured that Ohio will be hereafter a more formidable competitor than in the past, and such things will always happen so long as the railroads seek the easiest way and do not establish a ton-mile rate based on the costs of transportation.

But Colonel Dawson, who believes there is a conspiracy between the Pennsylvania R.R. and the Pittsburgh Coal Co., will doubtless be much surprised that the railroad in question has been reported as ready to injure the trade of the Pittsburgh Coal Co. by increasing Western freight rates from the Pittsburgh district. This intention, if really true, argues antagonism rather than conspiracy.

The Ohio operators, both east and south, seem well justified in continuing their action before the Public Utilities Commission as it is likely that only there will they obtain relief. As the State of Ohio will be blind to the destitution beyond its borders, it is likely that its action will not be modified by any sympathy for West Virginia miners or operators. It will be more "thorough" in its action than would for instance be the Interstate Commerce Commission with its larger national responsibilities. And yet that commission recently lowered anthracite rates severely, in one case 80c. per ton.

It would seem that West Virginia would feel safer by far in accepting the rates of the railroads which operate through her valleys and which therefore are interested in her welfare than in depending on the action of a commission in a neighboring state which is simply interested in the securing of reasonable rates in Ohio regardless of the effects elsewhere. The cry of such a commission is, "Hew to the line, let the chips fall where they may." What may happen to the railroad and coal business both when the commission gives its decision might spell the word "crisis" in larger letters than the printer of Colonel Dawson's pamphlet has seen fit to employ.

Colonel Dawson and most West Virginia operators believe that the trouble in Ohio is not from the constant freight rates, but from a variable introduced in the end of 1913—the run-of-mine law. But Colonel Dawson says the trouble in West Virginia will be from the constant opposition of the railroads, not from the variable introduced in 1915—the raised freight rate. As a matter of fact the union and the railroads are together to blame for Ohio's fate, and he would be bold who would mark the proportion. Whether Ohio suffers principally from high wages or high freight rates is a matter of opinion on which Ohio and West Virginia can if they are willing go on arguing forever. A wise man will keep free from such an interminable, inconclusive argument.

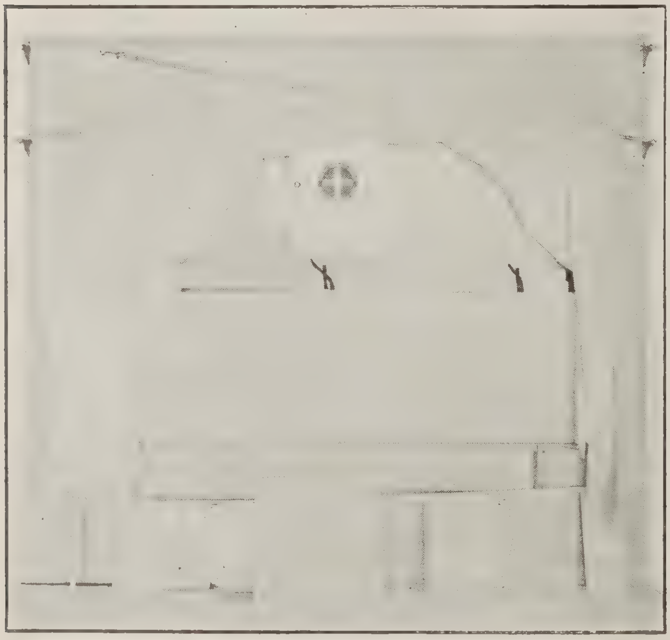
Sociological Department

A Folding Cot Room

Where space is lacking, a folding cot room may be installed which takes up when folded an area of only 6 in. by 7 ft. The illustration shows how the room is arranged. The bed folds back against the wall. The chair, the table and the stool can be collapsed so as to make up the minimum space. Two sides of the room are made by curtains that are suspended from swinging rods, and a light pole resting in sockets at the ends of these rods will sustain a third curtain which, with the wall in the rear, will complete the cot room. The chair, table and stool are enameled in white.

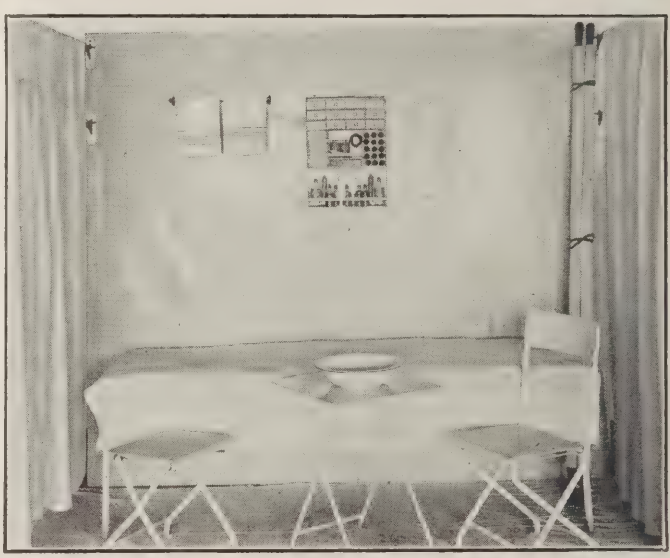
There is of course a first-aid cabinet which hangs against the wall. The box consists, not of tin, but of No. 20 gage auto-body steel, electrically welded, dust-proof and suitably enameled. By reason of its strength the case defies injury. As will be seen, at the top are 12 rolls of absorbent cotton, each in its separate sterile case. On the left are 20 separate packages of 6x36-in. sterile gauze. The central portion contains 2 wire-gauze splints, a package containing 5 yd. of 1-in. adhesive plaster, a rubber tourniquet, 6 cotton applicators in a tube and 12 tongue depressors. The rolls in the right mid-compartment comprise 12 1-in., 6 2-in. and 3 3-in. gauze bandages. Passing through slots in the mid-compartment and suspended in these are nickel-plated scissors and thumb forceps.

The medicaments at the bottom comprise 2-oz. bottles of 3-per cent. alcoholic iodine, of 4-per cent. boric acid, of aromatic spirits of ammonia, of jamaica ginger, of castor oil and 2 3-oz. tubes of burn ointment, composed of vaseline and bicarbonate of soda. A medicine glass and dropper complete the outfit.



INTERIOR OF FOLDING COT ROOM

Instead of a book of instructions a somewhat complete set of suggestions is fixed to the inside of the lid, at the base of which is space for the resident physician's name, address and telephone number. Great care has been taken to keep all the gauzes separate and sterilized. The folding cot room and its whole equipment are manufactured by the First Aid Equipment Co., of 16 East 23rd Street, New York City.



ROOM WITH FIRST-AID EQUIPMENT IN PLACE

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Beneficial Fund of Lehigh Coal and Navigation Co.

The beneficial fund of the Lehigh Coal and Navigation Co. dates back to 1884, when the employees contributed $8,253.61 and the company $9,351.99. The contributions of both remained reasonably constant, and in 1904 the employees were giving $11,440.64 and the company $9,853.66. From that time the employees and company put an increasing amount into the treasury year by year until in 1914 the employees were contributing $37,962.83 and the company $29,439.65.

From 1884 to 1914 inclusive the company paid into the fund $458,253.58 and the employees $468,253.55. From miscellaneous sources $47,074.12 was obtained, but $10,255 was from a sale of securities in 1904. The gross receipts in the 31 years were nearly a million dollars, the actual figure being $973,581.25. By the present date the million-dollar mark must have been largely exceeded.

Benefits have been paid already to the extent of $916,898.92, and the miscellaneous expenses have been $30,111.48, making a total outgo of $947,010.40. The total benefits and expenditures in 1914 reached $982,235.40, which left a balance of $8,654.15 due to the Lehigh Coal and Navigation Co. There was a cash balance in the treasury till 1901. In the years 1902 to 1907 inclusive the fund owed the company money. Then followed three more years when the fund had a balance, but since 1910 the fund has been in debt to the company from $6,043.82 to $9,376.91.

Company Pays 0.8c. per Ton

The present rules of the fund require the contributions to be made monthly, the Lehigh Coal and Navigation Co. giving 0.8c. for every ton of commercial coal produced by the company, the inside workmen contributing 0.8 per cent. of their earnings and the outside workmen 0.4 per cent. But no workman is required to pay more than $1 in any one month. All contributing workmen who may be accidentally injured when actually engaged in the service of the company are entitled to the following benefits:

If the disability lasts more than a week, the injured shall receive half the wages of the class of workmen to which he belongs for a period not to exceed 6 months for any one accident. If, however, the physician of the fund certifies under prescribed regulations that the accidental injury is such as to disable the employee from performing any regular occupation that will enable him to earn half the wages of his class of workmen, then the person so disabled may in the discretion of the trustees receive a sum that will bring his earnings up to an amount not to exceed one-half the wages of his class of workmen for each month of such disability for a period of not more than 24 months from the date of the accident. Claims for benefits not made within 12 months from the date of the accident are considered as absolutely lapsed.

In case of an injury resulting in death, $50 is paid for funeral expenses, and as in case of injury, a sum equal to half the wages will be paid for 18 months from the date of the accident to the widow, orphans or dependent relatives of the deceased or relatives on whom the deceased was dependent, payment being made to any, all or either of them as the board of trustees elects. If there is no widow, orphans or dependent relatives of the deceased or relatives on whom the deceased was dependent, the benefits lapse and the amount remains as a part of the beneficial fund, but so much as is requisite for funeral expenses and proper costs incident to the disability by accident is paid by the trustees. The rules require that when a contributor is killed, notice in writing of the existence of beneficiaries must be served on the trustees within 12 months after such member's death. If this is not done, the nonexistence of such beneficiaries is treated as conclusive and the benefits are regarded as absolutely lapsed. The rules also provide that no disability shall be compensated by more than $50 per month.

Stringent Rules for the Proving of Claims

Benefits are paid only if the foreman of the work at which the employee was injured files with the trustees a certificate signed by him stating the time at which the accident occurred and the fact that the man injured was engaged at that time in the service of the company. Moreover, the physician of the fund must file a certificate with the trustees stating that the accident is such as to disable the man injured or, in case of death, that the cause was not disease but accident. If, however, the man injured feels himself aggrieved by the refusal of the foreman or the physician to sign the necessary papers, he has a right to appeal directly to the board of trustees.

All money paid into the fund must be placed in charge of the board of trustees, which is appointed from time to time by the president of the company, who is requested to choose it partly from the officers of the company and in part from business men of experience and reputation in or near the mining region. The board is required to publish a report of receipts and expenditures at least once a year, and the members receive no pay for their services.

The rules provide that the physicians of the fund shall be appointed from time to time by the vice-president of the Lehigh Coal and Navigation Co. from the practicing physicians in the region. No charge is made for certificates, and the contributors to the fund engage and pay such physicians as they select.

The workmen all contribute to the fund, principally on account of the low benefits assessed. The employees of at least one other company have petitioned to have a similar fund started. But no workman is compelled to contribute to the fund, and after any semimonthly pay he can apply at the Lansford office of the company and receive the sum deducted from his pay. Thereafter no deduction will be made, the man's name will be stricken from the roll of the contributors, and he will not be entitled to any benefit till he has made another payment.

The fund is believed to be ample to meet all claims likely to be made upon it. If, however, it is found that the benefits can be increased, the trustees will have power to make the change.

Compensation Notes

The Iowa act relating to employers' liability and workmen's compensation has been declared constitutional by the Iowa Supreme Court in a decision rendered in the case of George Hunter, a coal miner, against the Consolidated Coal Co., appellant, of Colfax, Iowa. The ruling of the lower court was reversed, the Supreme Court declaring that the coal company had the right to introduce evidence that it was blameless for the injury to Hunter.

Hunter was an employee of the coal company and was injured by a fall of coal while in that employment. The case was tried in the Jasper County District Court, which held that Hunter was entitled to $100 as damages with interest at 6 per cent. from July 24, 1914. The coal company appealed from this decision, alleging that the new employers' liability law under which the award was made was unconstitutional in that it took away from the employer his right to prove to a jury that he was in no way to blame for the accident.

In the lower court Judge John F. Talbott ruled that the coal company could not make such a showing and denied the defendant a jury. The Supreme Court held to the contrary, however, and declared that under the new liability law of Iowa the employer is not precluded from making this defense, pointing out that the lower court erred in not permitting the coal company to come in and give evidence to a jury that it was not at fault. The case was remanded for a new trial on that point.

The Supreme Court says that the employer has the right to defend his case by showing that he was in no wise at fault for the injuries which the miner has sustained and which he charges are the fault of the defendant. In deciding that this defense is forbidden by the act the trial court erred, and for that reason the decision must be reversed. The case is remanded to enable the appellant to make such defense, assuming the burden of proof thereon, and to plead contributory negligence by way of mitigation of damages if advised to do either. In all other respects the decision below was held to be right and the validity of the statute under consideration was affirmed.

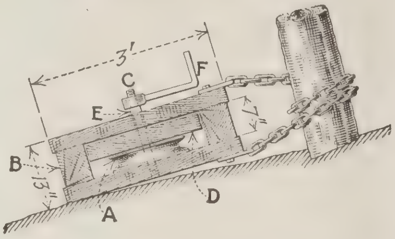
The Supreme Court pointed out that the lower court put a wrong construction on the law when it refused to permit the coal company to present evidence before a jury that it was entirely guiltless and that the injury was the result of the plaintiff's own negligence. The opinion, which filled 90 typewritten pages, is the longest ever filed in the Iowa Supreme Court.

Discussion by Readers

Handling Cars on Pitches

Letter No. 3—Referring to the recent discussion of the methods of handling cars on pitches and in response to the inquiry of Mine Superintendent, *Coal Age,* Oct. 23, p. 687, I am glad to describe for him what we called a "McGinty wheel," which was mounted in a block and chained to a post set at the head of the incline, as shown in the accompanying figure.

In this description I assume a moderate inclination of the seam, the mine being opened by means of a slope driven on the full dip of the strata. Levels or gangways are driven to the right and left of this main slope, and the "McGinty rooms," as we called them, were driven to the rise off the gangways. The success of this method depends on keeping the rooms straight and maintaining a good track. In the case I have in mind, the rooms were driven up as stalls with wide pillars between them, the crosscuts being driven from each room so as to meet about halfway in the pillar. This was necessary in order to reduce the distance of handling the coal in the long crosscuts where no track was laid and cars could not be taken.



"McGINTY BLOCK" FOR SELF-ACTING INCLINES IN ROOMS

When a room was first turned, and until it was driven up about 60 ft., a snubbing rope was used to lower the cars to the level. A post was then set at the head of the room and a McGinty block employed to lower the cars as the room was advanced beyond this point. A double track was laid in each room to permit the empty car going up to pass the loaded car coming down.

The McGinty block shown in the figure consists of an iron sheave *A* 15 in. in diameter and 4 in. wide, having a groove 3 in. deep in its face. This sheave is supported in a strong wooden frame *B* made of 3x12-in. plank. An iron pin *C* 1½ in. in diameter and 18 in. long passes through the center of this block and holds the sheave in place. The pin is prevented from turning by a ½-in. bolt that passes through the sole-piece of the block and a hole bored in the pin, as indicated in the figure. A screw thread is turned on the upper end of the pin to receive the brake handle *F*. As this handle is turned, its shank bears down on a collar or sleeve *E* that surrounds the pin *C* and which, in turn, presses against the brake-block *D,* which serves to control the speed of the wheel and the descending cars. The pipe section *E* is 2 in. in diameter and about 6 in. long. As shown in the figure, the McGinty block is secured to the post by a strong iron chain. The post itself is set in hitches cut in the roof and floor and is tightly wedged. This post is moved up as the face is advanced every 4 or 5 yd.

The first rope used in a room is about 150 ft. in length, the surplus length being wound in a neat coil and laid on the car. When the room is advanced a sufficient distance, another coil 250 or 300 ft. in length is substituted for the old one, which is used in shorter rooms, as required. The length of the second coil is adjusted to the distance the rooms are expected to be driven. This system answers well on pitches varying from 7 to 20 deg.

R. J. Brown.

Fernie, B. C., Canada.

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Average Working Days in Coal Mines

I have been interested in reading the editorial in your issue of Oct. 30, page 715, on the loss of wealth resulting from idle time in the coal mines of the United States, and I note that you have picked out two particularly horrible examples—namely, Arkansas and Oklahoma—as having worked only 174 days during 1913, or about 55 per cent. of the possible working time.

Would it not have been pertinent in this connection to have quoted what has been effected in the anthracite region of Pennsylvania since the operating companies established the custom of allowing the spring discounts. This custom was adopted in 1901 and was for the purpose of inducing consumers to purchase their supplies for the following winter during the discount months when ordinary demand is light and when operation and transportation are not liable to interruption by inclement weather. It was believed, and results have proved the accuracy of the belief, that this would also tend to a more even distribution of the working time throughout the year, so that there would not be so much idle time during the summer and a feverish attempt to keep up with the demand in the winter, with its "peak load."

The reports of the United States Geological Survey show how this scheme has worked out to the benefit of the mine employees. In the 10 years from 1892 to 1901 the average time worked in the anthracite region was 179 days, the fewest days in one year being 150 in 1897 and the largest number 198 days in 1892. The year 1902 is eliminated from the comparison because of the protracted strike in that year, but from 1903 to 1913 inclusive there was only one year in which the average working time fell below the best year in the earlier period.

In 1906, when a suspension of about 60 days pending the renewal of the wage contracts took place, the average number of working days was 195. This was in fact the only year in which the average working time fell below 200 days, whereas in the earlier period there was no year in which as many as 200 days were worked. From the minimum in 1906 of 195 days, the average ranged as high as 257 in 1913, with a mean average for the entire period of 220 days. The average working time since 1903 has exceeded that of the 10 years preceding 1901 by 41 days, or 23 per cent.

To what an extent this has equalized the distribution of the shipments throughout the year is shown by the fact that, in 1913, 50.3 per cent. of the shipments were sent out during the winter months and 49.7 per cent. in the summer months. During the five months of 1913 that the discounts were in effect, the shipments from the region were 28,789,730 tons. Of this amount the sizes above pea that were subject to the discounts amounted to 61.6 per cent., or approximately 17,740,000 tons. As the average reduction per ton during the period was 30c., it can be easily deduced that these concessions cost the operating companies approximately $5,320,000.

E. W. Parker, Director,
Anthracite Bureau of Information.

Wilkes-Barre, Penn.

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Labor in Mining

Letter No. 11—The discussion brought about by Hugh Archbald's article entitled "Why Are Strikes at Coal Mines of Such Frequent Occurrence?" *Coal Age,* July 24, p. 124, shows this to be a vital subject at the present time. The discussion also shows how unanimously the present practices of the United Mine Workers are condemned. I think, however, that those who have discussed the subject have failed to realize, or at least to bring forward, the fact that the union of mine workers has accomplished one aim for which the organization was formed. The primary object of all labor organizations is to increase the rate of compensation per unit of effort, and this has quite generally been accomplished, though usually with loss to the individual.

The average mine superintendent does not object to paying his men high wages. Indeed in some cases, as has been shown, operators have been compelled by the existing wage scale to pay a lower rate for a certain class of labor than they otherwise would. But with the growth of the union and the increase of its power and influence, its officers have adopted many practices that are obnoxious. As S. A. Driver points out in his letter, No. 8, Aug. 28, p. 349, operators do object to the mine workers depriving the owner or his agents of the right to hire and discharge their employees at will. I recall two instances that occurred in my own experience as superintendent of mines in the Southwest, which illustrate this point.

Struck a Large Feeder of Gas

The Mammoth No. 1 mine was our second largest producer. The mine was quite gaseous, and it happened that in driving the sixth-west entry we passed through some faulted coal that developed a strong feeder of gas at the roof. This died out, however, in a few days and was not considered dangerous until a cold spell in December, when so much gas was given off as to give a good cap in a Davy lamp. By the construction of a temporary wooden bridge the entire air current was carried past this point in the hope of diluting and rendering harmless the gas coming from the feeder.

On the morning following the building of this bridge I drove out to the mine and, after talking over the matter with the mine foreman and fireboss, decided that it would be unsafe to work the entry inby of where the gas was given off, except with locked safety lamps. Not having sufficient lamps to give the men, I directed the fireboss to order them out of the entry until the lamps could be obtained. The fireboss did this, walking down the entry to the sixth-west parting, where he established a "deadline."

Demanded the Discharge of the Fireboss

It so happened that the fireboss was *persona non grata* to the pit committee at that time, and the men demanded his discharge, claiming that he had "deal-lined" the entry while the men were still at work therein and that he was therefore "incompetent." Upon my refusal to comply with their request, the miners came out on a strike which was clearly a violation of the union contract. In response to my arguments the union officials said that they would not take the responsibility of ordering the men to return to work under a fireboss who they claimed was incompetent. The state mine inspector being called into the controversy advised me to discharge the fireboss, although he would not openly say that he regarded him as incompetent. As this occurred in the midst of the busy season, the company was rightly demanding coal.

I reasoned that my only excuse for discharging the fireboss would be to say that he was "incompetent," which would mean practically the breaking of the man for holding a similar position in the future. After due consideration, I absolutely refused to grant the men's demands, and following three weeks of idleness, they returned to work under the same fireboss.

Demand for Reinstatement of One Discharged

About six months later the mine foreman discharged the son of this fireboss for alleged carelessness and impudence. In the meantime the pit committee had been changed, and the new committee was now friendly to the fireboss, whose influence resulted in a strike being called, the men demanding the reinstatement of his son. These incidents show the desire of the union to control the employment and discharge of employees of the company at will.

Another incident of a slightly different character illustrates the same point. It occurred at another mine of which I had charge, in the Southwest. The boiler plant at this mine was in bad shape, the boilers were all over 20 years old and much weakened by the fact that the feed water used was strongly acid and a poor quality of slack was burned under the boilers. The conditions at the mine were such that none of these defects could be remedied at the time. The company had but one fireman who could keep steam while the mine was running. He was an exceptionally good man who took an interest in his work and was ambitious to learn.

Object to Fireman's Running an Engine

It had always been the custom at this mine for the hoisting engineer to keep the machinery in repair during idle days and Sundays. This work frequently took him into the mine, and at such times the fireman ran the cage, lowering and hoisting the engineer as required. The fireman was willing and eager to do this, as he hoped eventually to have an engine of his own to run. Strange to say the union objected to this slight matter on the ground that the fireman did not receive engineer's pay while running the engine, although the time when he was thus employed did not amount to one hour a week and the fireman himself had never requested engineer's pay. As the result of the demands of the union, the engineer was forced to climb up and down the shaft when his work called him below. It was frequently necessary, however, to take down a water-end or other heavy part of the pump, and at such times the fireman went down on the cage and the ash wheeler took his place firing in the boiler room.

Even then the union was not satisfied and decided that their "brother" (the fireman) must pay $50 into the treasury of the local if he wanted to work longer in the mines. It is needless to say that the fireman regarded this as outrageous, and not wanting to settle down to the life of a fireman, he resigned his position and went to work on a farm. H. P. SWEENY.

Malcolm, N. S., Canada.

"Dont's" for Mine Motormen

I would like to add two very important "Dont's" to the list given by James Thomas Reynolds, *Coal Age,* Nov. 20, p. 840. They are the following:

Don't stop your motor or trip where it is possible for another motor or trip to run into it, except at a regular station, without going or sending someone back to warn a following trip of the danger.

Don't run by a regular meeting place because the other trip does not happen to be there, without orders from someone in authority or positive and reliable information that the other trip is not coming.

Knoxville, Tenn. EDW. H. COXE.

Prohibition and Welfare Work

Letter No. 6—I remember that C. J. Fuetter, in his Letter No. 4, *Coal Age,* Oct. 2, p. 560, offered a friendly criticism of my statement made in a previous letter, Aug. 28, p. 350, to the effect that "I am inclined to think that there is a certain amount of coddling indulgence permitted in our welfare work among the foreign-speaking miners."

Mr. Fuetter asserts that his experience has taught him that the foreign-speaking miner has no greater desire to be "coddled" than the American miner. His experience may warrant him in arriving at that conclusion, but surely it does not coincide with the well-known practice peculiar to foreigners of showering gifts of fruits, vegetables, wines, etc., on their superiors. In this connection I am reminded of an instance where a general superintendent was obliged to refuse to accept a valuable diamond ring offered him for his wife by an Italian holding a fairly good position under him. The motive in bestowing these gifts may be an expression of gratitude rather than a desire to obtain unmerited favors, but whatever the ulterior motive may be, it is not American in spirit, does not conform to American ideas and should not be countenanced in any form or instance.

AIMS AND PURPOSES OF WELFARE WORK

The mission of genuine welfare work, as I understand it, is to replace in the foreigner with whom we labor and live the old-world habits and ideas that are not consistent with our methods, giving him instead principles of action that will put him on an equal plane with the best in American citizenship. If this is the proper conception of welfare work, how can its aims be better accomplished than by giving to each man a full and complete understanding as to what is expected of him, helping him to acquire the necessary ability to perform his duties and thus standing him on his own feet.

I readily agree with Mr. Fuetter that there is yet much to be desired in the way of welfare work in West Virginia, but my experience with the present forms already existing convinces me that there is little or none of the class distinction of which he speaks. I will cite one or two instances that have come under my observation: At Decota, W. Va., there used to be regular Y. M. C. A. night classes, to which foreigners and Americans belonged. As an incentive to membership and attendance, an occasional supper was served, at which times the general manager, superintendents and other mine officials would rub elbows with their drivers, miners and any other white person who cared to attend.

MUSIC AS A MEANS OF SOCIAL UPLIFT

At another West Virginia mining town there is a band composed of 21 pieces, eight of which are played by foreigners, and some of these men have shown exceptional musical talent. The director of this band, an accomplished musician, is an official of the operating company and willingly devotes his time to this work without remuneration of any kind.

Such social intermingling as this surely shows a democratic spirit, and as these people are of a very assimilative nature, its results are soon visible, and the good effect is shared by the entire community.

An eminent engineer in speaking on this subject used the following quotation: "Sow a thought and you reap a habit; sow a habit and you reap a character; sow a character and you reap a destiny."

F. S. JOHNSON, Chemist,
Coalton, W. Va. Davis Colliery Co.

Efficient Mine Foremen

Letter No. 13—I read with much pleasure the letter of Wm. Crooks on this subject, *Coal Age,* Sept. 4, p. 394, and can say that the time will not be wasted by anyone reading the same. It recalled to mind the time when I worked in the mine of which Mr. Crooks took charge when it was very much run down by reason of the man who preceded him having spent most of his time in the tophouse. So bad was the condition of the mines that the men could not work more than half a day. In a short time, however, the conditions were so improved that the miners worked all day and came out in the evening remarking on the good condition of the air in the mine.

GOOD AIR STOPPINGS SHOW FOREMAN'S EFFICIENCY

This reminds me of another incident in my own experience: I took a position as trackman and bratticeman in a mine where the air was very poor owing to leaky stoppings. Being sent to repair these stoppings, I found no lumber and suggested to the boss that he let me build rock stoppings, as there was plenty of refuse at hand for that purpose. He replied that he did not want any rock stoppings as they gave too much trouble.

After waiting a long time for the lumber, the air became so bad that men could not work long in their places. Others were hardly able to get home after coming out of the mine. The boss wanted to know what was the matter, and I took him into the mine to show him where the air was leaking through the board stoppings.

After some persuasion, he allowed me to build a few rock stoppings, on my promise not to draw any pay for the time if the results were not satisfactory. I built the stoppings, packing them well with fine dirt so as to make them air-tight. The result was that in a short time there was good air at the face. After that I was given the position of fireboss, but when the foreman wanted to make a change and have me build brattices at the same time, I looked around for another place.

When a Mine Foreman Is Not Responsible

In a neighboring mine where I found employment the foreman had so large a territory that he could not give it the proper attention, and the work he ordered was not half done, as the men were inclined to do very little when not watched. As a result, in this mine also, the air current was almost completely lost before reaching the face. The foreman applied to the manager for an assistant. Although it was evident that there was more work than one man could look after, hoping to save expense the manager refused to give the foreman the assistance he needed.

Later, when an assistant was appointed, the condition in the mine was such as to require two assistants to look after the work and see that it was properly done. I hope to live to see the time when there will be a law restricting the foreman to the charge of a single opening. In the case I have just cited it was not the foreman's fault, but the manager was to blame for not giving him the help needed. Under these conditions a good mine foreman will generally give up his place rather than be responsible for permitting the mine to run down while in his charge.

Need for Every Man to Do His Duty

In conclusion, I want to say that if every man in the mine would do his duty it would be comparatively easy for a foreman to handle a large territory. Experience shows, however, that the majority of miners will slight their work in order to make it appear that they complete a job in less time than other men. When such work is inspected, it is generally found that it will cost more to remedy the trouble than it would have cost to have done the work properly in the first place. If the foreman spends much of his time in the tophouse and leaves work that he should look after in the hands of his assistant, which is often the case, he is responsible for the poor work done, since the assistant devotes the most of his time in that case to putting out the coal, which he knows will please the foreman. In order to determine, therefore, whether a mine foreman is efficient, it is necessary to watch the daily operation of the mine closely.

Warrior, Ala. L. J. Wright.

Study Course in Coal Mining

By J. T. Beard

The Coal Age Pocket Book

AIR

Little was known of the aërial envelope that surrounds the earth, until the researches of Cavendish and Priestley in England and Lavoisier in France, in the latter part of the 18th century showed that air was **not an element,** as had been supposed, but a mechanical mixture of gases.

Up to this time, air and all combustible material was believed to contain a certain substance called **"phlogiston,"** which escaped as flame when the substance was burned. Both Cavendish and Priestley held this phlogistic theory even after they discovered the complex nature of air. Hence, the name "dephlogisticated air" was applied to oxygen; while hydrogen was called "inflammable air" and carbon dioxide "fixed air."

It remained for Lavoisier to expose this fallacy by showing that no matter was lost, but the weight of the products of a combustion was equal to that of the combustibles burned. A large number of carefully made analyses showed a practically constant proportion of the two chief gases of which air is formed. This seemed to suggest that the oxygen and nitrogen of the air were chemically united, although the proportion of each gas did not correspond to its combining power as determined by the analyses of well-known chemical compounds. The character of air as a **mechanical mixture** thus became definitely established.

Besides the two principal gases oxygen and nitrogen that constitute the air we breathe, there are other gases whose presence in the atmosphere is of much vital importance, although their proportion is small. Of these may be mentioned carbon dioxide, water vapor, ammonia, argon and ozone.

Carbon dioxide is most important, because of its toxic effect on the human system. This effect, it is stated on the highest authority, increases with the barometric pressure. Thus, for example, air containing but 1 per cent. carbon dioxide, at a pressure of 4, 5 or 6 atmospheres produces the same effect on the respiratory organs as air containing 4, 5 or 6 per cent. of the gas at a pressure of 1 atmosphere. In other words, **the true gage** of the effect of this gas in inspired air is the percentage of the gas multiplied by the number of atmospheres.

Water vapor present in the atmosphere breathed has a marked effect on the vital activities and the consequent development of physical energy in the body. In what manner the relative humidity of the inspired air operates to impair the physical force has not been fully explained; but experience has shown that a high degree of humidity in a warm atmosphere or climate has an extremely weakening effect on the human system.

The association of **high humidity and temperature** marks a comparatively large amount of water per unit volume of air and, to that extent, it may be assumed impairs the respiratory functions of the lungs. The result is to incapacitate men exposed to such conditions and render them wholly or in part unfit to perform the required manual or mental labor. These effects are continually observed in the warm moist atmosphere of deep mine workings and other similar places.

The Coal Age Pocket Book

The Respiratory System—Respiration is the prime means of maintaining the vital action in animal organisms. Its objects are twofold: 1. The **oxidation** of the organic matter of the animal tissues with the resulting development of vital energy. 2. The **removal** of the carbon dioxide produced in the process of oxidation. Both of these processes are performed through the medium of the blood.

The Circulation—Under the action of the respiratory system, the blood flows from the heart into and through the arteries of the body, as water flows through a circulating pipe system under the action of a pump. The pulsations of the heart, corresponding to the strokes of the pump, force the blood through a complex system of arteries and veins to every portion of the body and limbs.

All the blood does not flow in a continuous circuit, but the arteries branch, forming separate channels leading to different parts of the body. The time required to complete a circuit and return to the heart is obviously widely different, varying from 20 or 30 sec. to one-fourth as many minutes. This is of interest in relation to the time required for poison entering the blood to be disseminated throughout the system.

Respiratory Action—The action known as "breathing" originates or, at least, is regulated by a nerve center at the base of the brain from which impulses are transmitted through the spinal column to the respiratory muscles. By this means air enters the air cells of the lungs and oxygen, absorbed therefrom by the red corpuscles (hæmoglobin) of the blood, is carried by the circulation to the tissues of the body, where it is consumed with the production of carbon dioxide. This gas is absorbed by the blood and carried back through the veins to the heart and lungs, where it gives up a portion of its gas, which enters the lungs and is expelled by each succeeding exhalation.

While air expired by a healthy adult, at rest, contains from 2 to 3 per cent. carbon dioxide, careful determinations show a constant production of 5.6 per cent. of this gas in the lungs when the person is at rest.

Quantity of Oxygen Consumed in Breathing—A man at rest consumes 263 cm.^{3} of oxygen per min., or $263 \times 0.06102 = 16$ cu.in. per min. and exhales an equal volume of carbon dioxide. Air exhaled from the lungs contains 2.6 per cent. carbon dioxide, 18.3 per cent. oxygen, 79.1 per cent. nitrogen. In violent exercise, a man consumes from eight to nine times the amount of oxygen required when at rest; or, say 128 to 144 cu.in. per min. The exhaled breath may then contain 6.6 per cent. carbon dioxide and only 14.3 per cent. oxygen.

Depletion of Oxygen in Air, Effect on Life—Air containing 3 per cent. carbon dioxide can be breathed without discomfort, even when the oxygen content has been reduced to 16 per cent.; but 5 per cent. carbon dioxide causes headache, dizziness and nausea, after a short time. When no carbon dioxide is present in the air the oxygen content may fall as low as 14 per cent. before much difficulty is experienced in breathing; but air containing but 10 per cent. is no longer breathable; but will cause death quickly by suffocation.

Inquiries of General Interest

Calculation of Relative Humidity

Will you kindly give me a formula or explain a practical method for calculating the relative humidity of air directly from the readings of the wet- and dry-bulb thermometers, without the use of hygrometric tables. I am familiar with the method of calculating the relative humidity of air from the saturated-vapor pressures corresponding to the hygrometric readings, but this necessitates reference to the tables, which I wish to avoid. Say, for example, the dry-bulb reading is 70 deg. F. and the wet-bulb 63 deg. F. Is it possible to calculate the relative humidity of the air directly from these readings without referring to the tables I have mentioned?

Cokedale, Colo. MINER.

In estimating the degree of humidity of the atmosphere from the readings of the hygrometer, it is customary to use hygrometric tables which show the saturated-vapor pressures at different temperatures. In the use of this method the actual vapor pressure for any degree of saturation or any dry-bulb reading is first found by dividing the difference of the two readings by a constant 88, multiplying the quotient by the ratio of the barometric reading to the average sea-level barometer (30 in.) and subtracting this product from the saturated-vapor pressure corresponding to the wet-bulb reading. This is expressed by the following formula:

$$p_v = p_w - \frac{B}{30}\left(\frac{t_d - t_w}{88}\right) \qquad (1)$$

The relative humidity H is then found by multiplying the actual vapor pressure p_v by 100 and dividing by the saturated-vapor pressure corresponding to the dry-bulb reading taken from the tables, as expressed by the formula

$$H = \frac{100\, p_v}{p_d} \qquad (2)$$

Applying these formulas to find the relative humidity in the case cited by the correspondent and assuming a barometric pressure $B = 30$ in., the saturated-vapor pressures corresponding to the dry and wet readings, as taken from the tables, are $p_v = 0.7335$ and $p_w = 0.576$, the corresponding temperatures being $t_d = 70$ deg. F. and $t_w = 63$ deg. F. For the actual vapor pressure we then have, from formula 1,

$$p_v = 0.576 - \frac{30}{30}\left(\frac{70 - 63}{88}\right) = 0.576 - \frac{7}{88} = 0.4964 \textit{ in.}$$

Then, applying formula 2 for the relative humidity, we have

$$H = \frac{100 \times 0.4964}{0.7335} = 67 \textit{ per cent.}$$

No formula has as yet been published, to our knowledge, by which the percentage of humidity can be calculated directly from the wet- and dry-bulb readings of the hygrometer without reference to the tables previously mentioned. We would suggest, however, that fairly approximate results can be obtained for sea-level readings by the use of the following formula, though it requires a knowledge of logarithms, owing to the decimal exponent. In this formula the 0.84 power of the difference of the readings is divided by the dry-bulb reading and the quotient obtained multiplied by the absolute zero of the Fahrenheit scale. The resulting product subtracted from 100 gives the percentage of moisture or the relative humidity of the air. Thus,

$$H = 100 - 460\frac{(t_d - t_w)^{0.84}}{t_d} \qquad (3)$$

Assuming sea-level observations (bar. 30 in.) and substituting the values previously given, $t_d = 70$ deg. and $t_w = 63$ deg., we have for the relative humidity,

$$H = 100 - 460\frac{(70 - 63)^{0.84}}{70} = 66.3 \textit{ per cent.}$$

Again, assuming a sea-level barometric pressure of 30 in. and hygrometric readings, $t_d = 65$ deg. and $t_w = 45$ deg., and finding the relative humidity corresponding to these readings by formulas 1 and 2, since the corresponding saturated-vapor pressures taken from the tables are $p_d = 0.6176$ and $p_w = 0.2995$ in., we find for the actual vapor pressure, applying formula 1,

$$p_v = 0.2995 - \left(\frac{65 - 45}{88}\right) = 0.0733 \textit{ in.}$$

Then applying formula 2, we find the relative humidity,

$$H = \frac{100 \times 0.0733}{0.6176} = 12 \textit{ per cent., nearly.}$$

Finding the relative humidity in this case by the use of formula 3, as proposed, we have

$$H = 100 - 460\frac{(65 - 45)^{0.84}}{65} = 12+ \textit{ per cent.}$$

The formula (3) given above is in no respect a rational formula, but has been derived by observation of hygrometric tables and gives a fairly close approximation to the percentages of humidity obtained by the use of the tables, while the calculation is much shorter. As stated previously, however, formula 3 can only be applied to sea-level observations.

The question of the effect of barometric pressure on the relative humidity of air is an interesting one and worthy of careful scientific investigation, with a view to developing a rational formula that will enable the calculation of the relative humidity of the atmosphere directly from the wet- and dry-bulb readings of the instrument. It will be observed, in this connection, that formula 1 is not a rational formula, since it depends on the empirical constants 88 and 96, the latter being used for dry-bulb readings below 32 deg. F.

We would be glad to have readers of *Coal Age* give this question careful consideration and send us the results of their investigations, as the question submitted is one of practical interest to all engaged in mining work.

Examination Questions

Tennessee Examination Held at Knoxville, Nov. 23-25, 1915

(*Selected Questions*)

Ques.—What is a creep as applied to coal mines?

Ans.—A "creep" in coal mining may be described as a peculiar movement or disturbance of the strata overlying the mine workings from which the coal has been extracted without leaving sufficient pillar coal for the support of the overburden or without providing for the gradual settlement of this burden on the waste material stored in the space from which the coal has been taken.

Creep is manifested by the "nipping" or chipping off of small particles of coal from the upper portion of the pillars close to the roof. As the creep proceeds, the pillar coal becomes more or less crushed. Timber sets are crushed and broken like pipe stems, with the progress of the creep. Where the pillar coal is hard and the bottom soft, creep is manifested by the heaving of the bottom in the open space between the pillars, both in the rooms and on the entries. Creep is best prevented by proportioning the width of the pillars to the size of the openings, with due regard to the thickness of the seam, its depth below the surface and its inclination.

Ques.—In developing a mine, how would you be guided as to the size of pillars along main entries and airways?

Ans.—The width of pillars flanking the main entries and airways will depend largely on the method employed in developing the mine. In the room-and-pillar system the width of these pillars is determined by the depth of cover, nature of the overlying strata, thickness and inclination of the seam, hardness of the coal, roof and floor and the length of time required for the extraction of the coal and final settlement of the roof in the vicinity of the pillars.

As a guide, under ordinary conditions in flat seams, the width of main entry pillars may be taken as one-fourth of the square root of the continued product of the depth of cover, thickness of seam and width of opening, all expressed in feet. Thus, for a depth of 200 ft. below the surface, the main-entry pillars in a 5-ft. seam of commonly hard coal, for rooms 24 ft. wide, may be taken as $\frac{1}{4}\sqrt{200 \times 5 \times 24} =$ say 40 ft. Conditions in respect to the nature and hardness of coal, roof or floor and inclination of seam may increase the width of these pillars.

Ques.—How should aircourses be maintained so as to get the best results from the ventilating power?

Ans.—It is important in this relation to keep the aircourses free of every obstruction that will prevent the free passage of the air current. They should be timbered sufficiently to prevent roof falls or the undue sagging of the roof, and all refuse should be cleaned up at regular intervals. Every effort should be made to keep the aircourses as straight as possible and to avoid sharp bends. Breakthroughs or crosscuts at the head of a pair of entries should have the same sectional area as that of the airways and be kept free of all obstructions. A most important point in maintaining airways so as to obtain the best result is to build substantial stoppings in all crosscuts that are closed to the passage of air. These stoppings should be sealed so that they are practically air-tight. Also, all doors and air bridges should be made as air-tight as possible to prevent the leakage of air at such points.

Ques.—Explain fully the different systems of ventilation and the benefits to be derived from each.

Ans.—The several systems of ventilation in mines may be described as: (1) Natural ventilation, which is produced by a natural air column formed in a shaft, slope or in dip workings in mines, owing to the difference of temperature between the intake and return aircourses. (2) Furnace ventilation, which is produced by heating the air in an upcast shaft by means of a furnace located in the mine close to the foot of the shaft, thus producing an air column that causes a ventilating pressure in the mine. (3) Fan ventilation, which is divided into two systems known as the exhaust and the blowing systems of ventilation. In the exhaust system the mine is ventilated under a pressure less than that of the atmosphere, while in the blowing system the mine pressure is above that of the atmosphere.

The benefits of natural ventilation consist in making use of natural agencies for producing an air current in the mine and thus avoiding the expense of installing special apparatus for that purpose. The benefits of furnace ventilation are chiefly manifest in deep shafts, where the higher temperature of the furnace shaft produces a high ventilating pressure at a comparatively small cost.

The benefits of fan ventilation are a better control of the ventilation in the mines during all atmospheric changes and the ability to increase or decrease the circulation of air in the mine by changing the speed of the ventilator. The exhaust system of ventilation is particularly applicable to gaseous mines, where it is desirable to perform the haulage on the main-intake aircourse. Such an arrangement makes it necessary to adopt the exhaust system and place the fan at the return opening of the mine. The blowing system of ventilation is particularly adapted to large mines, especially where there is much abandoned area that generates more or less gas that would find its way into the main-intake current if the exhaust system was used and the mine ventilated under a pressure below that of the atmosphere. When the mine pressure is above that of the atmosphere, the gases generated in these abandoned areas are forced back and frequently find vent through crevices and breaks extending to the surface.

Ques.—What is air?

Ans.—Air is the more or less constant mixture of gases surrounding the earth; in other words, the atmosphere that sustains life. It consists chiefly of nitrogen and oxygen gases, in the ratio, by volume, of 4 : 1, with small amounts of carbon dioxide, moisture, etc.

Coal and Coke News

Harrisburg, Penn.

The vocational bureau of the State Department of Public Instruction is coöperating with the various municipal school boards throughout the state preparatory to the establishment of continuation schools in compliance with the Cox Child Labor Act which becomes effective Jan. 1. This act provides for a compulsory school attendance for a minimum of 8 hr. a week between 8 a.m. and 5 p.m. on any day of the week except Saturday.

Supervisors of state industrial education and field workers are directing a canvass of all mining companies and manufacturers employing minors between the ages of 14 and 16 years. Nearly all the employers interviewed, with the exception of the larger coal companies will retain the minors in their employ after Jan. 1. It will be necessary for some to make slight readjustments in their operations to give every minor 8 hr. a week to attend continuation school. The employer is not compelled to pay the minors for the time they attend school.

The continuation school will be in session the same number of weeks a year as the regular schools of the district. Each pupil attending the continuation school may attend for a period of 8 hr. on one day, 4 hr. on two days, or 2 hr. on four days, per week.

If it is advisable, all the schooling may be given continuously, provided a total number of hours of schooling received by each minor in the continuation school be equivalent to 8 hr. a week for the number of weeks which the regular school is in session. These continuation schools may be conducted in a public school building, or in the establishment in which the minors are employed, or in other suitable buildings.

Insurance Rating Bureau Is Organized

Organization of the Compensation Insurance Rating Bureau of Pennsylvania, the aim of which is to provide uniform classification and rates for liability insurance under the Workmen's Compensation Act, was begun this week with the adoption of a constitution by representatives of 18 of the 32 companies authorized to do casualty business in this state. A board of managers has as yet to be named before organization is completed. Headquarters, it is understood, will be opened in Philadelphia.

Membership in the bureau is open to any company or corporation authorized to issue policies of insurance within the provisions of the Workmen's Compensation Act, and this includes the State Insurance Fund. Under the constitution, the State Commissioner of Insurance is ex-officio a member of all committees of the bureau.

The bureau, it is explained, will bear the same relation to the conduct of employer's indemnity insurance in Pennsylvania as the Underwriters' Association does to the fire-insurance business. One of the first moves to be made by the central board will be to promulgate a manual of rates under the different classifications of risks, based on the merit system. The introduction of uniform rating and inspection system is expected to furnish the insured with an incentive for safeguarding his workmen in every possible way, as under the merit plan the rates are based solely on the hazard involved.

Francis Rawle and J. W. Henderson, counsel for the Italian consulate in Philadelphia, appeared before the Workmen's Compensation Board during the week to discuss the forms to be adopted for establishing proof of death of Italian workers in Pennsylvania, and what proofs will be required by the board to determine the dependents in Italy of workers killed in this country. The representatives of the consulate state that there are about 400,000 Italians in Pennsylvania, many of them working in coal mines.

The Workmen's Compensation Board has received assurance that the United States Steel Corporation will give its complete coöperation in complying with the Workmen's Compensation act in this state. The subsidiary companies in Pennsylvania, include the Carnegie Steel Co., National Tube Co., American Bridge Co., American Steel and Wire Co., American Sheet and Tin Plate Co., Pittsburgh, Bessemer and Lake Erie R.R. Co., and the H. C. Frick Coke Co.

The Steel Corporation in its letter gave the Workmen's Compensation Board the following assurance: "I wish to assure you, although I think it is quite evident, that it is the disposition of the Steel Corporation and its executive officers without exception, to do all in their power to comply, not only with the letter, but the spirit of this law."

PENNSYLVANIA

Pittston—The Lehigh Valley Coal Co. has commenced pumping the water from the abandoned No. 6 slope at Yorktown preparatory to remining the old workings.

Shannandoah—A number of collieries in this district have recently been idle on account of a lack of empty cars. If it had not been for this factor the workingmen in the coal region would have experienced one of the most prosperous Christmas seasons on record. Even as it is the amount of money paid out in wages by the mining companies to their miners and other employees has been much larger than ordinary.

Dunmore—One man was killed and four more were injured in an explosion of gas at 9:30 o'clock on the night of Dec. 3, in the Underwood colliery of the Pennsylvania Coal Co. Two of the four are probably fatally injured. An Italian miner set off a blast in a gas-filled crosscut just after he had been warned by the fireboss not to shoot. The fireboss, Patrick McKane, is the most seriously injured of the four who were sent to the hospital.

Hazleton—The city assessors have recently increased the valuation of all property from 30 per cent. to 50 per cent. and the Lehigh Valley Coal Co. has appealed to city council that the valuation on 552 acres of coal land owned by the company within the city limits is entirely too high. It is likely that the case will be carried to the courts in case the appeal is not allowed by the city officials.

After having been abandoned about a quarter of a century on account of water accumulating faster than the pumps could remove it, the Yorktown No. 6 slope of the Lehigh Valley Coal Co. is about to be placed in operation. With powerful modern electric pumps no particular difficulty is expected in clearing the mine and thus developing this large deposit of coal.

Lansford—The Lehigh Coal and Navigation Co. is installing a new machine at No. 14 water hoist. It is to be operated by a 1,200-hp. induction motor, taking 25-cycle current at 2,300 volts. It will hoist a load of about 50,000 lb. through a distance of 865 ft. and deliver water at the rate of 180,000 gal. per hour.

Bituminous

Connellsville—The production of coke in the Connellsville region is practically stationary at about 435,000 tons. An insufficiency of labor prevents an increase in this production.

Leetonia—The coke plant of the Cherry Valley Iron Works of the United Iron and Steel Co., at Leetonia, consisting of 198 ovens, has been placed in full operation after being idle since Jan. 1 last.

Tarrs—The Southwest plant, better known as "Old Red Top," of the H. C. Frick Coke Co., has been fired after a shutdown of several months. There are about 124 ovens at "Old Red Top" and when in full operation the plant will employ approximately 120 men and boys. It is also rumored, but the rumor has no confirmation, that the Old Valley Works of the same company will also be revived.

Barnesboro—Fire destroyed the tipple at the Kinport mine of the Hastings Coal and Coke Co. on Dec. 3. The origin of the fire is not known. The fire had a good start before the firemen arrived, but they were able to prevent the destruction of the big supply house and adjoining buildings. As a result of the fire the mines will be closed for some time.

Punxsutawney—The Rochester & Pittsburgh Coal and Iron Co. has posted notices of the closing of the Florence mine for the winter on account of labor troubles. Recently 500 men struck for an increase in wages and the company took the stand that the men had violated the agreement entered into by the miners' union. Not being able to reach an understanding it was decided to suspend work indefinitely.

WEST VIRGINIA

Charleston—A petition in involuntary bankruptcy has been filed in the United States District Court against the Davy Pocahontas Coal Co., of McDowell County. The Graham Manufacturing Co. is one of the petitioners. The coal company operates several mines along the N. & W.

Boomer—The work of recovering the bodies of the victims of the recent mine explosion at Boomer has been completed, and the mine will shortly begin operation. It will probably be some little time, however, before the working of this mine settles down to its normal course.

Huntington—Coal shipments over the Chesapeake & Ohio R.R. lines during November showed a decided increase over the month of October, and also the corresponding month of last year. It is stated that 2,417,870 tons of coal were carried during the month, this being an increase of about 100,000 tons over October and 600,000 tons over the same month of 1914. Officials of the railroad are elated over this increase.

Wheeling—The 3-ton cage at the Glendale mine of the Hitchman Coal and Coke Co. recently broke its hitchings and plunged to the bottom of the shaft, a distance of about 100 ft. The cage was loaded with an empty mine car and both cage and car were thoroughly demolished. Four men were near the foot of the shaft when the cage let go, but were at such a distance that none were injured. A new cage has been constructed and work resumed.

KENTUCKY

Whitesburg—Superintendent M. Sergeant and Assistant Superintendent P. F. Pillins, with other officials of the Lexington & Eastern Branch of the Louisville & Nashville, recently made a trip of inspection over the North Fork extension through the Elkhorn coal fields with a view to putting on additional trains to meet the rapidly increasing traffic, owing to the activity of the coal mines around McRoberts, Fleming, Hamond, Seco, Kona and other points.

Frankfort—A record of accomplishment in the way of keeping down forest fires this season is reported from the office of state forester, J. E. Barton. During the season which closed on Dec. 1, there were only 24 fires. The good work is credited to the county fire wardens. All extra employees of the service were discharged on Dec. 1.

OHIO

Columbus—Judge Kinkead, of the county courts, recently granted judgment aggregating $18,000 against the Sunday Creek Coal Co., and in favor of the New York Coal Co. The judgments were granted in four of a series of suits filed by the New York company against the Sunday Creek company, growing out of coal lands which the former had leased to the latter under royalty agreements.

Bellaire—The Johnson coal mine, at Pipe Creek, recently resumed operations after having been idle since the beginning of the Eastern Ohio coal strike, nearly two years ago. About 100 men were put to work. When operating full force the mine employs nearly 300 men. The present complement will be increased from time to time during the ensuing weeks.

ILLINOIS

Nokomis—Installation of the new Rutledge & Taylor Nokomis mine has been completed. The shaft is on the Big Four and the Chicago & Eastern Illinois railroads.

Duquoin—Trustees of the estate of the late Henry Horn, Sr., mine owner and banker, are disposing of the mining property, real estate and business buildings to satisfy the claims of the depositors in the Henry Horn bank, which failed more than a year ago. The business buildings have been closed out at $65,000. The mine and coal lands will be sold in a short time. It is expected that more than $100,000 will be realized and that the creditors will receive about 30c. on the dollar.

Belleville—Operators of the Belleville district have started a movement for the readjustment of the mining scale for the purpose of removing the disadvantage under which the district now suffers by reason of lower mining prices and favorable railroad rates enjoyed by the Franklin, Williamson and Saline County fields, about 100 mi. south of Belleville. The miners are paid 61c. per ton for mining in the Belleville district, while in the southern Illinois field the wage is 75c. The favorable rate was allowed to the southern Illinois field two years ago on account of a disparity of railroad facilities then existing. Since that time the Southern field has obtained better facilities than the Belleville field. In addition, the southern Illinois field now enjoys the same freight rate to St. Louis as the Belleville field. It is claimed that mining properties in St. Clair and Madison counties have been unproductive for two years on account of these disadvantageous conditions.

IOWA

Des Moines—On Saturday, Nov. 27, 3,000 coal miners in Des Moines and Polk County drew their pay for the last half of November, amounting to $100,000. Practically every mine worker in the county was in Des Moines. Each man drew from $35 to $50. The men are now working on full time.

PERSONALS

Governor Henderson, of Alabama, has just appointed W. H. Thompson, of Piper, as associate mine inspector to succeed T. H. Teinney, resigned.

G. E. Alloway, formerly with the Banks Supply Co., has accepted a position on the sales force of the Ironton Engine Co., and will make headquarters at Ironton, Ohio.

Col. R. A. Phillips, who has for many years been connected with the Lackawanna coal company, has resigned the position of general superintendent on account of failing health.

J. H. Anderson, formerly with the Consolidated Coal Co., and later with the Northern Coal Co., has joined the selling force of the Peabody Coal Co., and will travel in Missouri and part of Illinois.

James Summers, of Hazleton, Penn, electrical and mining engineer, has taken a position with the Ironton Engine Co., Ironton, Ohio, as mining engineer and will be located at the plant at Ironton, Ohio.

Daniel B. Wentz, of the firm of J. S. Wentz & Co., coal operator, has been elected to the directorate of the Franklin National Bank, one of the three most important financial institutions in the city of Philadelphia.

J. J. Wolfersperger, of Pallas, Routt County, Colo., has resigned as superintendent of the Yampa Valley Coal Co.'s mine at that place, effective Dec. 22, after which date he will spend a month in Chicago and Evanston, Ill.

Robert Erskine, of Cinderella, Mingo County, W. Va., was recently appointed District Mining Inspector of the 12th District of that state, succeeding Isaac Murray. Mr. Erskine will have his headquarters at Bramwell, in Mercer County.

A. C. Lammont, of Scranton, chief mining engineer of the Delaware, Lackawanna & Western R.R., was appointed, Dec. 6, general superintendent of the mining operations of the company, succeeding Col. R. A. Phillips, resigned on account of ill health.

Dr. J. A. Udden, geologist of the Bureau of Economic Geology, University of Texas, was appointed Oct. 26, 1915, director of the bureau, the former director, Dr. William B. Phillips, having resigned to become president of the Colorado School of Mines.

Robert B. Beahm, who for many years has handled the general sales of Weston Dodson & Co., Bethlehem, Penn., in an efficient and successful manner, will, at his request, be relieved of that position on Jan. 1, 1916. He, however, will remain with the company in an advisory capacity after that date.

W. J. Smith, formerly superintendent of the Welch Coal and Coke Co., Welch, W. Va., has resigned his position and accepted a place on the sales force of the Ironton Engine Co., Ironton, Ohio, and will look after the Norfolk & Western and Virginian Ry. territory, making headquarters at Welch, W. Va.

Charles R. Wessman, formerly sales manager of the Main Jelico Mountain Coal Co., has accepted a position with the Ironton Engine Co., to handle its mining machinery and will be located in Knoxville, Tenn. He will have charge of the territory around Birmingham, Ala., Tennessee and southeastern Kentucky.

Benjamin Davis, prominent in anthracite mining circles, was severely injured recently. Mr. Davis is the chief electrician of the Susquehanna Coal Co. and while laying out a new line in the Hickory Ridge colliery a pole fell on him, from which he sustained a badly crushed leg, in addition to internal injuries.

L. E. Wood was recently elected president of the Crystal Block Coal and Coke Co., of Rawl, W. Va., the Crystal Block Mining Co., of Gates, the Central Pocahontas Coal Co., of Anawalt, and the Tug River Power Co., of Hazard, Ky., and the Crystal Supply Co., of Rawl. Mr. Wood has for years been in the service of the United States Coal and Coke Co., at Gary, but will henceforth make his headquarters at Welch.

Col. Truman H. Aldrich, one the pioneer coal-mining men of the Birmingham district, who has been postmaster of Birmingham, Ala., for the past four years, and whose term as postmaster expires shortly, will, about Jan. 1, return to his former occupation of consulting mining engineer, which profession he followed for many years before being appointed postmaster. The town of Aldrich, Ala., where the Montevallo Mining Co. is operating a seam of coal, was named for Mr. Aldrich.

W. A. Phillips, representing the coal companies in the upper end of Luzerne County, Penn., was named by the court on Dec. 2, as contractor for the working of the road in Pittston and Jenkins Townships. Mr. Phillips had the contract last year and keeps the highways in repair at the expense of the coal companies without the levy of a road tax. He filed bonds, in the sum of $11,500, for keeping in repair 23 mi. of highways in Pittston Township, and $5,000 for taking care of 10 mi. of highways in Jenkins Township.

OBITUARY

John Hastie, aged 69 years, for many years mine foreman at the Katy-did colliery at Avoca, Penn., died recently at his home, 1236 Main St., Avoca.

George P. Cronk, treasurer and general manager of the Pennsy Coal Co., of Franklin, Penn., died recently at his home in Franklin.

William P. Rend, president of the W. P. Rend Coal Co., died recently at Chicago. Mr. Rend was a native of Ireland, coming to the United States at the age of seven years. He was also a veteran of the Civil War. He was heavily interested financially in mines in Ohio and Indiana, the output of which has been estimated at over 1,000,000 tons a year. He also owned 2,000 freight cars used in the coal business.

John N. Hodges, the originator of the steam shovel coal-stripping industry in the Pittsburg, Kan., district, died at the Stillwell Hotel, Pittsburg, Nov. 30. He had been in ill health for six months. Mr. Hodges opened the Franklin-Arma-Edson fields. His early life was spent in railroad-construction work and he built many of the branch lines of the Santa Fé railroad in Kansas, Oklahoma and Texas. He is survived by three sisters and two brothers.

Thomas Pruden, 60 years of age, and a prominent coal operator and business man, died recently at Fountain City, a suburb of Knoxville, Tenn. Death was due to acute indigestion. Born in England, Mr. Pruden came to the United States about 35 years ago. He spent his entire life in and about the coal mines and at the time of his death was President and General Manager of the Pruden Coal and Coke Co., the Black Creek Coal and Coke Co. and the First Creek Coal and Coke Co.

Thomas R. Phillips, of Kingston, Penn., treasurer of the Haddock Coal Mining Co., died on Dec. 1 at Nesbitt West Side Hospital, Kingston, of complications, following an operation for gall stones performed on Nov. 23. He was a native of Wales, but had lived in the Wyoming Valley since childhood. He filled various positions with the Plymouth Coal Co. for 40 years, was one of the receivers of that concern, and of recent years had been treasurer of the Haddock company. He is survived by his widow, two daughters and one son.

PUBLICATIONS RECEIVED

"Evaporation of Potash Brines," by W. B. Hicks, Geological Survey Professional Paper 95 E. Illustrated, 7 pp., 9½x11½ in.

Electrothermic Smelting of Iron Ores in Sweden, by Alfred Stansfield, Canada Department of Mines, illustrated, 65 pp., 6½x9½ in.

"Report of the Chief Inspector of Mines in India for the Year Ending Dec. 31, 1914," by G. F. Adams. Illustrated, 81 pp., 8½x13 in.

The Age of the Ocala Limestone. By Charles W. Cooke. Geological Survey, Professional Paper 95 I. Unillustrated, 10 pp., 9¼x11½ in.

The Caubelego, Budgery and Budgerygar Mines, by E. C. Andrews, New South Wales Department of Mines, illustrated, 121 pp., 6x9½ in.

Annual Report of the Secretary of Internal Affairs of Pennsylvania, Part 3, Industrial Statistics 1913-1914, unillustrated, 125 pp., 6x9 in.

"Notes on the Geology of Gravina Island, Alaska. By Philip F. Smith, Geological Survey, Professional Paper 95-H. Illustrated 10 pp., 9¼x11½ in.

"Erosion Intervals in the Eocene of the Mississippi Embayment," by Edward W. Berry. Geological Survey, Professional Paper 95-F. Illustrated, 9 pp., 9¼x11 in.

"Preliminary Report on the Diffusion of Solids," by C. E. Van Ostrand and F. E. Dewey. Geological Survey, Professional paper 95 G. Illustrated 13 pp., 9¼x11½ in.

"Triangulation in West Virginia, Ohio, Kentucky, Indiana, Illinois, and Missouri," by A. L. Baldwin, Coast and Geodetic Survey, Serial No. 14, Special Publication No. 30. Illustrated, 67 pp. 9x11½ in.

Triangulation Along the Columbia River and the Coast of Oregon and Northern California, by Charles A. Mourhess, Coast and Geodetic Survey, Series 15, Special Publication No. 31, illustrated 149 pp., 9x11½ in.

The Geology and Mineral Resources of Buller-Mokihinui Sub-Division, Westport Division, by Percy Gates Morgan and John Arthur Bartrum, New Zealand Geological Survey Branch, Bulletin No. 17, illustrated, 209 pp., 8½x11 in.

TRADE CATALOGS

The Stow Mfg. Co., Binghamton, N. Y.. "The Stow Flexible Grinder." Illustrated, 4 pp. 6x9 in.

The Carnegie Steel Co., Pittsburgh, Penn., "Steel Sheet Piling." Illustrated, 95 pp., 5x7½ in.

The Jeffrey Mfg. Co., Columbus, Ohio. "Revised Price List, Jeffrey Detachable Chain." Illustrated, 7 pp. 6x9 in.

The Quaker City Rubber Co., Philadelphia, Penn., "Mechanical Rubber Goods." Illustrated, 180 pp., 6x9 in.

The Standard Underground Cable Co., Pittsburgh, Penn. "Standard Motor Cables." Illustrated, 12 pp., 6x9 in.

The Gardner Governor Co., Quincy, Ill., "Helpful Hints on Air Compressor Installations." Illustrated, 8 pp., 4x9 in.

The Globe Iron Roofing and Corrugating Co., Cincinnati Ohio. "Globe Metal Shingles." Illustrated, 10 pp., 4x9 in.

The H. W. Johns-Manville Co., New York, N. Y., "J-M Sanitor Drinking Fountains." Illustrated, 15 pp., 6x9 in.

The Terry Steam Turbine Co., Hartford, Conn., U. S. A., "The Terry Turbine," Bulletin 20. Illustrated, 8 pp., 8½x11 in.

The Walsh & Weidner Boiler Co., Chattanooga, Tenn. "Tank, Plate and Structural Steel Work." Illustrated, 12 pp., 8½x11 in.

The Harrisburg Pipe and Pipe Bending Co., Harrisburg, Penn., "The Harrisburg Feed Water Heater." Illustrated, 4 pp., 3½x6 in.

American Bitumastic Enamel Co., New York City. "Recent Achievements in the Prevention of Corrosion." Illustrated, 47 pp. 8x10½ in.

The Harrison Safety Boiler Works, Philadelphia, Penn. "Finding and Stopping Waste in Modern Boiler Rooms by the Use of Cochrane Meters." Illustrated, 68 pp. 6x9 in.

INDUSTRIAL NEWS

St. Louis, Mo.—The Peabody Coal Co. has removed to larger and more commodious quarters on the 12th floor of the Syndicate Trust Bldg.

St. Louis, Mo.—The "Burr" mine of the Carterville Coal Co., at a recent public sale brought $37,000. The St. Louis Union Trust Co. was the purchaser.

Philadelphia, Penn.—The Valley Camp Coal Co. has purchased for $250,000 the steel steamer "E. L. Wallace" and will place the boat in the coal-carrying trade.

Lamar, Mo.—The Arcadia Coal and Mining Co. has been organized at Lamar with a capital stock of $40,000. The incorporaters are Logan Rives, Walter Webb and D. B. Houston.

Nashville, Tenn.—The Blizzard Coal Co. has been organized with a capital of $20,000. The incorporators are E. F. and Paul Blizzard, Bert Ingram, C. W. Harman, and V. A. Treat.

Hamilton, Ohio—The Hamilton-Otto Coke Co. is contemplating the construction of a plant for the extraction of light oil as a byproduct of the coke plant, at a cost of about $80,000.

Birmingham, Ala.—The Majestic Coal Co. filed articles of incorporation in this city recently with a capital stock of $40,000. The officers are: H. L. Morrow, president; W. H. Kirkland, vice-president; L. W. Andrews, secretary and treasurer.

Washington, D. C.—A petition of the coal operators in the Wyoming region of Pennsylvania for a rehearing on the new rates to the Atlantic coast on small sizes of anthracite was recently denied by the Interstate Commerce Commission.

Lansford, Penn.—The Lehigh Coal and Navigation Co. is now making anthracite briquettes and marketing them. If the venture proves to be commercially profitable it will go a long way toward the prevention of waste in anthracite production.

Knoxville, Tenn.—The last of the property of the Ideal Block Coal Co., bankrupt, near Lily, Ky., has been sold by the receiver, Mr. E. G. Stooksbury, of Knoxville, Tenn. The affairs of the company will probably be wound up by the first of the year.

St. Louis, Mo.—The Dosenbach Realty Co. of this city has just sold a large tract of land, comprising 3,000 acres, in the coal fields of Birmingham, Ala., to the Majestic Coal Co., represented by the Bush interests, who are large coal and iron operators in that district.

Bluefield, W. Va.—The Flat Rock Coal Co., which had offices in this city and whose mines were near Honaker, has been purchased by Lynchburg interests, who intend to take over and operate the mines on a larger scale. S. T. Lee will be president of the new concern.

Whitesburg, Ky.—The Cumberland Mountain Coal Co., with headquarters at Charleston, W. Va., has purchased from the Mason Coal and Coke Co., an eastern corporation, more than 13,000 acres of rich coal and timber land. The property lies along the route of the proposed extension of the Virginian R.R.

Charleston, W. Va.—The new Rex Coal and Coke Co., with headquarters at Huntington, has been organized with a capital of $100,000. The incorporators are G. F. Wallace, L. R. Reese, J. W. Lawton, C. P. Gibson and F. H. McClung, all of Huntington. Mines will be operated in the vicinity of Ethel, Logan County.

Jefferson City, Mo.—The Iroquois Mining Corporation of Kansas City, has been incorporated with a capital of $50,000. The incorporators are A. L. Stump, E. M. Gordon and R. L. Dennison. The purpose of incorporation is to operate mines of all kinds, build general mining and ore smelting operations and development business.

Duluth, Minn.—November coal receipts at Duluth and Superior amounted to over 1,000,000 tons and brought up the season's total, exclusive of December shipments, to about 9,700,000 tons, which is approximately 200,000 tons greater than the entire season of 1914. December shipments will still further increase this amount of coal.

Lexington, Ky.—The Kenark Union Land Co., with $25,000 capital, has filed articles of incorporation here and will engage in development of coal, gas and timber lands, the charter authorizing the company to engage in railroad and real estate business. The incorporators are: R. W. Kenney, Lexington; J. R. Combs and W. G. Sellers, Hazard.

Huntington, W. Va.—Jairus Collins, of Bramwell, W. Va., heading a syndicate of West Virginia capitalists, has leased a boundary of 15,000 acres of Buffalo Creek coal land in the Perry County, Kentucky field, and will begin immediately the development of the property on a large scale, giving employment to several hundred men from the start.

Philadelphia, Penn.—The steel ship "Bylaly," built for the Pocahontas Coal Co., has been launched from the yards of the builders at Camden. The boat has a capacity of 5,450 tons and a speed of 10½ knots. The boat is similar to the "Norfolk," recently built for the Coastwise Navigation Co. The "Bylaly" will ply in the trade between Norfolk and New England points.

Philadelphia, Penn.—The "Silver Shell" and the "Virginia," two new coal steamers just completed for service in the fleet of the Pocahontas Fuel Co. having been delivered by the builders are now on their initial trips in the coal trade. Another vessel similar to the "Virginia" will be launched shortly from the shipyards in Camden, and after being fitted out will join the above fleet.

Charleston, W. Va.—The Hartland Colliery Co. has been organized with headquarters at Clay and a capitalization of $5,000. The incorporators are John B. Hart and Edward Hart, of Clarksburg; Marcy McD. Price, of New York; David T. Price, of Johnstown, Penn., and W. I. Booth, of Clarksburg. The purpose of the organization is to operate mines in the Henry and Pleasant districts of Clay County.

Wellsburg, W. Va.—It is reported that J. C. McKinley, of the Richland Coal Co., has purchased a considerable acreage of valuable land just north of the Beech Bottom coal tipple. A persistent rumor is to the effect that the property purchased by Mr. McKinley will be used by a large steel corporation in the establishment of a big mill. Mr. McKinley, on the other hand, says that the property will be utilized by the Richland Coal Co.

Toledo, Ohio—It has been announced here that the Chesapeake & Ohio R.R. has practically financed the proposed link between that road and the Hocking Valley. This connection is to extend from Plymouth, north, to the terminals of the Hocking Valley, and south to Columbus. It has been incorporated under the name of the Chesapeake & Ohio Northern Ry. and has sold $1,000,000 first-mortgage, 30-year 5 per cent. bonds. The work of constructing the link complete will cost about $4,500,000.

St. Louis, Mo.—The Rutledge & Taylor Coal Co., with home office in this city, and branches in Chicago, Omaha, St. Paul, Kansas City, Davenport and Fort Dodge, Iowa, is said to be marketing 12,000 tons of coal daily from its three mines: From the Livingston mine, 4,500 tons; Nokomis mine, 4,000 tons, and Security mine, 3,500. Livingston mine is rated as the largest commercial mine in Illinois. Records show that for the year ending June 30, last, 809,291 tons were produced, averaging 4,522 tons per day for each day the mine was in operation.

Knoxville, Tenn.—The property of the New River Coal and Coke Co., comprising about 50,000 acres of coal rights in Anderson, Campbell and Scott counties, Tennessee, on the New River R.R., which was offered for sale a short time ago by Walter Devault, receiver, Knoxville, Tenn., was not sold, and the receiver has had some further prospecting done on the property to better show the coal it contains. The property carries the Red Ash, Dean, Jellico or State, and Blue Gem seams above drainage, and probably the Coal Creek seam below drainage.

Chicago, Ill.—At a meeting held in Chicago, Nov. 29, of members of the Illinois Coal Operators' Association and the Indiana Bituminous Coal Operators' Association, to discuss the present freight-rate situation, it was decided to intervene against the advance in coal rates in Illinois and Indiana on or before Dec. 25. The general sentiment of the operators was to the effect that they would not oppose any horizontal advance which might include other districts, but they felt that increases from Illinois and Indiana, with a probable reduction in the Hocking field rates, would further reduce Indiana and Illinois tonnages to Chicago and Northwestern markets.

La Follette, Tenn.—The property of the La Follette Coal, Iron and Ry. Co., consisting of coal mines, coke ovens, coal washer, iron ore mines, limestone quarry, blast furnace, machine shop, railroad, and coal, iron and limestone lands, together with dwellings, farms and timber lands, at and near La Follette, Tenn., are to be sold on Dec. 18 by the receiver, Neil Robinson, of La Follette. The furnace is at present closed down, being relined. The plants have all been steadily operated by the receiver for about two years, except that Rex No. 2 coal mine was closed down by the receiver shortly after his appointment, and most of the loose equipment removed to the other two coal mines. A steam shovel for loading coke at the coke ovens has been added to the equipment by the receiver.

Bluefield, W. Va.—Five coal companies, including the Pocahontas Domestic Coal Co., the Williamson Coal and Coke Co., the Warrior Coal and Coke Co., and the Yukon Coal Co., are planning the entire electrification of their mines at a total cost of approximately $25,000. The Elkhorn Coal and Coke Co. will install an electric plant at a cost of about $8,000. Another company, one of the largest in the state, operating above Williamson, will install a $60,000 to $75,000 electrical equipment in the spring. It is estimated that contracts for upwards of $150,000 worth of electrical equipment either have been or will be shortly placed in the Norwalk & Western fields. In the Guyan River field the Main Island Creek Coal Co. has advertised for bids on electrical equipment. This concern recently completed the installation of a $14,800 electrical plant. The company is located at Omar.

Coal Trade Reviews

General Review

Anthracite in short supply, but consumers still generally indifferent. Indications of a runaway market in bituminous. Continued advance in ocean freights. Excellent situation at Pittsburgh and the Middle Western trade is speeding up.

Anthracite—The dealer trade has been fairly busy, as a result of the sustained low temperatures, supplemented by the congestion in transportation facilities, but there is still a general absence of the real snap that should characterize the business at this time. Supplies are clearly falling behind consumption, due to the inadequate car supply and the railroad congestion, but consumers have not yet experienced any inconvenience and fail to show an active interest in the situation. The steam grades are easily the leaders in a generally strong market, and buyers are demanding full shipments on their contracts. Persistent rumors of sweeping revisions in the anthracite circulars appear to be substantiated to a certain extent by the fact that no negotiations have so far been conducted on contracts for the new year.

Bituminous—The slow though persistent improvement of the past several weeks has culminated in a distinct hardening of the market all along the line. Conservative interests are definitely anxious over the situation, and it is generally agreed that any further interruption to transportation facilities, such as a tightening of the congestion at New York, would more than likely precipitate a runaway market. The market is difficult to quote, prices fluctuating over a wide range, some unusually high figures being offered for coal on cars at the distributing centers to fill out contracts, though scarcely any such offers are accepted. Supplies at Hampton Roads are more than ample, but the coastwise movement is exasperatingly slow, due to scarcity of vessels and rough weather, and agencies at Down East points are becoming decidedly worried.

Exports—The unprecedented high freights on steam vessels is forcing more schooners into the off-shore trade, and in spite of this it is practically impossible to negotiate a coal charter to Mediterranean ports, except where an occasional vessel appears that is too old to handle grain. Coastwise freights are moving in sympathy with the export business, and are now ruling at prohibitive levels except where shippers are so hopelessly behind on the contracts that they are forced to meet the new figures. The movement over the Hampton Roads piers continues disappointing, with the demand at a minimum, and the accumulation somewhat above normal.

Ohio Valley—The cessation in Lake shipping has served principally to postpone a marked improvement that would otherwise be noticeable at this time. The situation is rather mixed even as it is, there being an unexpectedly heavy demand for slack coal. Conditions are uniformly favorable to a maximum consumption; the steel industry is working at the highest capacity in its history, manufacturing establishments are running well and the general prosperity will stimulate an active domestic consumption. The removal of the embargo on certain railroads has created a better feeling, but the increased consumption due to the lower temperatures is still throwing an excess load on the carriers. Many of the important steam contracts expiring Jan. 1 are absorbing the attention of the sales agencies.

Middle West—The freezing temperatures have speeeded up the Middle Western trade in an impressive manner, while prices have responded to the improved conditions, and the market is thoroughly in control of the operators. Farsighted consumers are beginning to anticipate a period of high prices and are instituting energetic measures to insure their supply; some large public service corporations are putting out inquiries covering their requirements two and three years ahead. Final receipts at the upper Lake ports have been heavy, while the cold weather has precipitated such a flood of rush orders from consumers that the dock companies have been forced to full-time operations in loading out coal.

A Year Ago—Anthracite under pressure and working schedules heavily curtailed. Bituminous continues flat with prices weak and irregular. Slack the best feature. Reactionary effect of the mild weather.

BUSINESS OPINIONS

Iron Age—Transactions in Lake Superior iron ore are on the verge of closing which it is believed will establish a price of $4.25 for Mesaba Bessemer and $3.55 for Mesaba non-Bessemer ore, an advance of 80c. for the former and 70c. for the latter upon the prices of this year. Old-range ores, according to present indications, will sell at an advance of about 75c. over the 1915 schedule instead of $1, as favored by some producers. As demand is expected for all the ore that can be got down in 1916 it is not improbable that sales later in the season will represent an advance over opening prices. The difficulty of forcing pig-iron production above the present rate appears in the statistics for November. At 3,037,308 tons for last month, the output was 101,244 tons a day, against 3,125,491 in October or 100,822 tons a day.

Boston News Bureau—Attention is focussed on the President's message. This needs study before the best criticism is possible. Wall Street seemed to accept the message fairly well. Probably no message was ever read the world over as this one will be. The more one studies business conditions the more one is impressed with the improvement under way. All through the West sentiment is most optimistic. Then again, the most gratifying reports are those coming from the South. When we recall the situation in the South a year ago, the contrast is most striking. It is generally believed that 1916 will be a most prosperous year for business men in all lines.

Dun—Nearly every development is of a constructive nature, and further gains are added to those previously recorded. Each week domestic consumption enlarges, while the railroad embargoes emphasize the magnitude of the export business. There is now scarcely an industry or trade in any section that is not participating freely in the general advance. In striking contrast to the tendency in the same period of 1914, commercial failures in the United States during November were slightly less numerous than in the previous month, while the aggregate liabilities made the best exhibit of the year. Total insolvencies, numbered 1,565 and supplied an indebtedness of $15,694,434, as against 1,599 in October for $25,522,380 and 1,815 in 1914, when the amount involved was $25,489,498.

Bradstreet—Apparently, the week has been the busiest in a long time. Activity in trade as well as in leading industries is unabated—is more marked, in fact, than heretofore. Jobbers, wholesale dealers, retailers, manufacturers and bankers are a unit in reporting activity, and sold-up-for-months-to-come is the condition of numerous industries. Complaints spring from inability to get supplies and from chagrin at not having bought at lower price levels than now prevail, rather than from lack of demand.

Dry Goods Economist—Retailers are evidently beginning to realize the difficulties surrounding the supply of certain lines of merchandise. Buyers who have hitherto shown decided conservatism in providing for even their near-by wants are now urging manufacturers to accept orders for delivery at quite distant dates. The growing indications of prosperity, the high prices of raw materials, the shortage in dyestuffs, and the increased consumption of domestic products through the curtailment of imports are the compelling factors.

Marshall Field & Co.—Current wholesale distribution of dry goods shows a handsome increase over the corresponding period of a year ago. Improved retail demand and low stocks brought merchants to market in large numbers. Road orders for both immediate and future delivery are in considerable advance of previous years. Collections are about normal. Prices are firm.

The Southern Lumberman—Though few December price lists are as yet available, such lists as have been mailed out show further advances in yellow pine prices, and current sales are reported as being made at prices which, on a number of items show material advance over values realized on sales during the first two weeks of November. The volume of business, in hard wood which has steadily increased for the past three months, is now moving with such force as to cause optimism and renewed activity on all sides.

ATLANTIC SEABOARD

BOSTON

Ample coal at Hampton Roads but scarcity of boats to bring it forward. A real "flurry" apparently on the way. Georges Creek and Pennsylvania grades in difficulties over car shortage. Water freights advancing to high figures. Anthracite shippers getting far behind on deliveries.

Bituminous—Receipts of Pocahontas and New River are still light, and bottoms are extremely hard to get. Most of the distributors are anxious over shipments and are doing their best to piece out until cargoes arrive. Rough weather at sea is still the rule, barges moving with exasperating slowness. Meanwhile, there is ample coal standing at Hampton Roads where prices are as yet unaffected by the demand at this end; $2.85 is still quoted f.o.b., high-water freights putting a quietus on spot purchases in any volume. It is a little soon for premiums on coal f.o.b. on top of say $1.50 premium on freight alone. Several buyers already covered by contract on their normal supply have been trying to get extra shipments but the scarcity of transportation is so pronounced that such efforts are next to useless.

Undoubtedly on-car prices for delivery inland would be much higher than they are if there were any coal available. As high as $4.25 has been offered on cars Providence, but no sales reported.

The recent turn in the situation has also given pause to the scramble for 1916-1917 contracts. Most of the options at low figures are now understood to be withdrawn, although something like a million tons was closed while the campaign was on, for delivery from Boston alone. A lot of alongside business has also been closed during the same period.

Shippers of Georges Creek along with other factors served by the same railroads are having difficulties over car supply. Rail movement is bound to be slow for weeks if not months to come, and there will be general surprise if the car situation is not much worse before it is better; $2 is now quoted for Georges Creek as compared with the usual season basis of $1.67 f.o.b. mines. Coastwise movement is also very slow and it is only because they have fewer obligations that these shippers have less to worry about than the agencies that look to Hampton Roads.

The Pennsylvania grades are quoted higher than a week ago; $1.75 is being paid for good coals from the Clearfield region, but comparatively small tonnages are to be had. A good deal of coal is offered "subject to prior sale," and usually that means that ten or dozen brokers may be working on the same lot. Some of the railroads are following the market very closely but no actual transactions can be reported. Meantime operators who sold coal in round figures in order to keep the mines going through the dull season have all they can do to make hand-to-mouth deliveries on their most urgent requisitions.

Water Freights are soaring; $2 has already been paid, Hampton Roads to Providence, almost no carriers of any kind being available for anything like prompt loading. Practically the only parties who will pay these rates are shippers who are hopelessly behind on their contract obligations, or consumers themselves who have coal due them and insist on chartering for the contractor's account. Freights to Providence are 75@80c., with as high as $1 reported.

Anthracite—The companies are getting farther and farther in arrears on their orders. Promises are no longer made as to time of delivery. Stove coal is getting in short supply at New York, and dealers here are obliged to take egg and chestnut to get cargoes loaded. Barges move slowly and the demand far exceeds the supply.

Bituminous quotations, f.o.b. loading port at points designated, are about as follows per gross ton:

	Philadelphia	New York	Baltimore	F.o.b. Mine
Clearfields	$2.80@3.05	$3.10@3.35	....	$1.55@1.80
Cambrias and Somersets	3.00@3.25	3.30@3.50	....	1.75@2.00
Georges Creek	2.92@3.25	3.22@3.55	$2.85@3.18	1.67@2.00

Pocahontas and New River prices, on cars Boston, are $4@4.30; Providence, $4.15@4.25; and f.o.b. loading ports at Hampton Roads, $2.85.

NEW YORK

Anthracite consumption increasing. Retailers are busy and urging quicker deliveries. Steam coals scarce and commanding full prices; $2 coal the rule. Water freights higher.

Anthracite—The hard-coal market is more than holding its own. Consumption has increased considerably and supplies are correspondingly less. While no serious complication has as yet developed, retail dealers state that continued cold weather will soon necessitate quick deliveries as their supplies are getting low. On the other hand, shippers are seriously handicapped by the severe and continued congestion on the railroads.

Serious car shortages continue and many of the mines are idle much of the time. Egg coal remains the longest in supply and some stray cargoes have been picked up at 10c. below full circular. Stove is in good demand and fewer straight orders for this size are filled; buyers being urged to take a mixed cargo. Chestnut is the strongest. The steam sizes are tight. Pea is bringing full prices all around. Buckwheat No. 1 is well cleaned up; the cheaper grades are bringing $2.45 while the choice grades are scarce, and held at slight premiums. Rice and barley are also scarce.

Quotations, f.o.b., gross tons, at Tidewater follow:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$5.05		$5.10	
Egg	5.30	$5.20@5.30	5.35	$5.25@5.35
Stove	5.30	5.30@5.30	5.35	5.35@5.35
Chestnut	5.55	5.55@5.55	5.60	5.55@5.60
Pea	3.50	3.45@3.50	3.55	3.50@3.55
Buckwheat	2.75	2.45@2.75	2.80	2.45@2.80
Rice	2.25	1.95@2.25	2.30	2.00@2.30
Barley	1.75	1.50@1.75	1.80	1.75@1.80

Bituminous—Heavy demand and high prices are the dominating features of the soft-coal market. The prediction that the market would see $2 coal at the mines has been realized and even higher figures are noted. Quotations of $4 f.o.b. Tidewater would not be surprising soon. There is not an over-abundance of coal on hand and railroads are unable to get shipments foward. There are also some labor troubles in the Clearfield region which threaten to spread.

Many shippers are complaining of coal lost somewhere between the mines and Tidewater and are urging the railroads to rush it forward, while boats are held at the docks waiting for the coal. Car supply remains on about a 60 per cent. basis. Very little coal can be had for less than $2 at the mines and indications point to a 25c. increase within a few days. Line quotations are on a similar basis. No f.o.b. quotations at less than $3.20 are heard even for the cheaper grades. Slack is held at from $1.15 to $1.25.

Quotations, gross tons, f.o.b. Tidewater, for various grades follow:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.80@3.90	$3.80@3.90	$3.80@3.90	$2.25@2.35
Georges Creek Tyson	3.30@3.50	3.30@3.50	3.30@3.50	1.75@2.00
Clearfield:				
Medium	3.30@3.40	3.30@3.40	....	1.75@1.85
Ordinary	3.30@3.40	3.30@3.40	....	1.75@1.85
Broad Top Mountain				1.25@1.45
Cambria County:				
South Forks	3.30@3.55	....	....	1.75@2.00
Nanty Glo	3.30@3.55	....	....	1.75@2.00
Barnesboro	3.25@3.35	....	....	1.75@1.85
Somerset County:				
Quemahoning	.....	3.30@3.50	3.30@3.50	1.75@2.00
Medium	3.25@3.35	3.25@3.35	3.25@3.35	1.75@1.85
Latrobe	3.20@3.30	....	....	1.65@1.75
Greensburg	3.30@3.50	....	....	1.65@1.85
Westmoreland	3.20@3.30	.....	....	1.45@1.55
West Virginia Fairmont ¾		3.05@3.15	3.05@3.15	1.25@1.35
Fairmont mine-run		3.00@3.15	3.05@3.15	1.25@1.35
Steam		3.20@3.30	3.20@3.30	1.65@1.75
Western Maryland		3.20@3.30	3.20@3.30	1.65@1.75

PHILADELPHIA

Pea shipments falling behind demand. Consumers doing little stocking. Inadequate car supply and delayed movement serious. Bituminous market nervous. Prices continue upward, with $2 coal in sight. Exports still quiet.

Anthracite—Another week has passed without the expected snap to the trade developing despite a two-in. snowfall in the suburbs. The dealers were fairly busy, but each day's orders were usually cared for promptly. Late buyers have so far not been inconvenienced and show little interest in the market. This has a depressing effect on the dealer, who is also showing a tendency to avoid preparing for an emergency that is all the time becoming more obvious among the operating interests. If there is any unusual rush it is a question if it can be handled properly. The inadequate car supply has caused many collieries to close down for several days at a time; one of the largest companies had 15 collieries shut down in one day from this cause. Deliveries have also been very unsatisfactory and in many instances coal has been in transit ten days or two weeks between the scales and destination.

Broken coal is still in active demand and the companies are not anxious to take orders for any quantity of this size. A ready market at $3.50 and tax awaits all the coal that is not contracted for at $3.25 and tax. Egg coal shows very little improvement and while of course the companies are adhering to their price of $3.75 and tax, there have been recent sales by individuals at 25c. per ton less. Stove remains popular and if there is any price cutting it is only on inferior grades and not worth mentioning, for even fair coal brings the full circular of $4 and tax. Chestnut has had a varied career, but now all good grades are being sold at $4.15 and tax and one or two shippers with high-grade coal report a shortage.

Pea coal is the real leader and dealers protected at $2 and tax are calling for heavy shipments. None of the large companies have sold $2 pea coal in the open market since Nov. 1, but they have sold considerable at $2.25 and tax. Most of the individuals are insisting on $2.25 and tax and not soliciting business at that figure; they are actually moving considerable tonnage at $2.50.

The companies who usually contract at this time of year, about 90 per cent. of the total, have not as yet taken any steps in that direction. The feeling is becoming general that the delay is due to an impending revision of the prices. Collections continue good, but the retailers apparently do not intend to cease their price cutting. Good shipments continue via Port Richmond for tide points.

Prices per gross ton, f.o.b. mines for line shipment and f.o.b. Port Richmond for tide, are as follows:

	Line	Tide		Line	Tide
Broken	$3.50	$4.75	Pea	$2.50	$3.25
Egg	3.75	5.00	Buckwheat	1.50	2.25
Stove	4.00	5.00	Rice	.85	1.75
Chestnut	4.15	5.25	Barley	.50	1.50

Bituminous—A nervous tenseness pervades the market. Plenty of business is offering, but there is not near enough coal to supply the demand. The car supply continues to grow less, and the railroads are slow in making deliveries. Prices continue their upward movement, as has been the case for several weeks. The export business is quiet, with a good demand for charters and few boats available, although the week showed a little spurt in the number of charters arranged for. The prices per gross ton are as follows:

Georges Creek Big Vein	$1.95@2.10	Fairmont gas, ¾	$1.45@1.50
South Fork Miller Vein	1.75@1.85	Fairmont gas, mine-run	1.30@1.40
Clearfield (ordinary)	1.65@1.70	Fairmont gas, slack	1.10@1.20
Somerset (ordinary)	1.65@1.70	Fairmont lump, ordinary	1.20@1.30
West Va. Freeport	1.50@1.60	Fairmont mine-run	1.10@1.15
		Fairmont slack	1.10@1.20

BALTIMORE

Market dominated by car supply and price list uncertain. Hard-coal surplus here gradually being wiped out. Export movement very poor.

For the most part the operating interests are concentrating their efforts to keep up with their existing contracts rather than covering any new fields. Prices herewith, in gross tons at the mines, are based largely upon coal sold between mines and shippers and mines to take care of urgent contracts:

	Mines	Balt.*	Fairmont	Mines	Balt.*
Geo. Crk. Big Vein	$2.00	$3.18	Ordinary mine run	$1.30	$2.73
Geo. Crk. Tyson	1.60	2.78	Ordinary ¾	1.40	2.83
Clearfield	1.45	2.63	Ordinary slack	1.05	2.48
South Fork	1.60	2.78	Low sulphur mine-run	1.50	2.93
Latrobe	1.45	2.68	Low sulphur ¾	1.60	3.03
Somerset (best)	1.50	2.53	Low sulphur slack	1.10	2.53
Somerset (good)	1.35	2.43			
Quemahoning	1.60	2.78			
Freeport	1.35	2.53			
Miller Vein	1.50	2.63			

* F. o. b., outside Capes.

The export movement from this port continues very poor due to the shortage of bottoms. The past week saw a movement of only 11,588 tons on foreign account.

Temperatures around the freezing mark most of the time are causing anthracite consumers to seek coal in larger quantities. The result is that stocks are dwindling; smaller grades are exceptionally scarce in some quarters.

HAMPTON ROADS

November dumpings better than expected. Demand light. Foreign trade irregular. New trade channels opening up.

The movement from Tidewater during the week has not been as heavy as was anticipated. The export movement has been well divided with Italy receiving perhaps the largest amount going to any one country. A number of battleships have been supplied with bunker coal during the week and the government has also taken coal cargoes by colliers.

The demand for both spot and contract business has been light and prices are unchanged on Pocahontas and New River but for high volatile there seems to be some improvement in the demand and some little advance in price. The accumulation of coal at Tidewater is somewhat in excess of normal on the smokeless grades but there is practically no high volatile on hand which has not been contracted for. High rates for steam vessel tonnage is still forcing schooners into the foreign trade, five having taken export cargoes during the week; these cargoes were for two ports in Bermuda, Santo Domingo, Montevideo and San Juan, P. R.

While the total dumpings at Hampton Roads ports for November were not a record as compared with other months of 1915, at the same time they were larger than any November of previous years, and were heavier than expected. The total movement amounted to 1,079,004 tons of which quantity the Norfolk & Western dumped 520,971 tons, the Chesapeake & Ohio 338,364 tons and the Virginian 219,669 tons.

Railroad Tonnages—Dumpings over the local piers for the past five weeks compare as follows:

	Week Ending				
Railroad	Nov. 6	Nov. 13	Nov. 20	Nov. 27	Dec. 4
Norfolk & Western	120,590	133,329	100,598	118,065	116,450
Chesapeake & Ohio	78,210	70,282	67,209	93,924	81,875
Virginian	46,952	72,888	39,485	54,591	41,386
Totals	245,752	276,499	207,292	266,580	239,711

Ocean Charters, Clearances and Freights

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	To	Tons	Rate
H. Lippitt	Point-a-Pitre	790	$4.12½
T. Winsmore	Casilda	381	4.00
F. C. Bowen	Calais	892	
Skogstad	Martinique	2,357	
Tordenskjold	Barbadoes	2,295	
Kaupanger	Genoa	2,357	
St. Joseph	Italy[1]		
E. H. Blake	Bermuda	900	3.25
B. P. Pendleton	Para		
Trym	Guantanamo	1,138	
Storfond	Havana	2,256	

[1] West Coast.

VIRGINIA

Vessel	To	Tons	Rate
California	River Plate	4,897	11.50
Apollo	Pernambuco[1]	1,110	8.50[2]
L. Bossert	Bermuda[3]	488	
M. W. Bowen[4]	Buenos Aires	1,907	
R. W. Clark	Bermuda	437	

[1] Or Rio Janeiro. [2] January-February. [3] Thence Fernamdina to Martinique with fertilizer in bags. [4] Back to N. Y. with Quebracho wood.

BALTIMORE

Vessel	To	Tons
Mar Cor	Italy[1]	2,059
A. Barbour	San Juan	1,171

VESSEL CLEARANCES

The following steamers have cleared from various ports during the week ended Dec. 3:

NORFOLK

Vessel	Destination	Tons
Grange[1]	St. Lucia	6,895
Tasmania[3]	Leghorn	4,033
Luigi Ciampa[3]	Civita Vecchia	4,163
Doris[5]	Gib	5,275
Stavangeren[1]	Kingston	1,030
Soerakarta[3]	Java	5,000
Alleghany[4]	Havana	1,426
O. C. Curtis[1]	Montevideo	2,500
Wm. E. Burnham[1]	Hamilton	1,105
Jacksonvill[1]	St. Georges	960
Geo. M. Grant[6]	San Juan	1,510
C. E. Look[6]	Santo Domingo	712
Carlo[5]	Gib	7,120

NEWPORT NEWS

Vessel	Destination	Tons
Theresa[4]	Havana	3,032
Mayaro[2]		994
M. Jover[2]		2,839

NEWPORT NEWS—Continued

Vessel	Destination	Tons
Progresso[2]	Havana	5,793
Boden[4]	Stockholm	6,542

PHILADELPHIA

Vessel	Destination	Tons
T. Menier	La Romana	794
S. Gaspara	Mediterranean	
J. E. Drake	Martinique	1,400
Daylight	Fort de France	
Skogstad	Fort de France	2,357
Sonora[2]	Cienfuegos	1,186
F. C. Bowen	Calais	1,400
Kaupanger	Genoa	2,104
Trym	Guantanamo	
T. Winsmore	Casilda	900

BALTIMORE

Vessel	Destination	Tons
Franklin	Alexandria	7,048
Mar Cor	Genoa	2,306

[1] Castner, Curran & Bullitt, Inc. [2] Berwind-White Coal Min. Co. [3] Pocahontas Fuel Co. [4] Smokeless Fuel Co. [5] Flat Top Fuel Co. [6] Baker-Whiteley.

OCEAN FREIGHTS

The tonnage scarcity is growing more acute, which has a tendency to advance freight rates to new high levels. Mediterranean rates are unchanged, although occasionally there is a steamer, too old for grain, that is willing to accept coal at less than the equivalent rate on grain. There is an urgent demand for steamers for River Plate ports, and tonnage is difficult to obtain even at advanced figures. Sugar rates from Cuba have advanced to unprecedented figures, and owners of the few boats available for the West Indian trade prefer to send them in ballast unless they can secure very high rates on coal outward. We would quote freight rates on coal by steamer as follows:

To	Rate	To	Rate
Havana	$2.75@3.25	Bermuda	$3.50@ 4.00
Cardenas or Sagua	3.50@4.00	Vera Cruz	5.50@ 6 50
Cienfuegos	3 75@4.00	Tampico	5.50@ 6 50
Port au Spain, Trinidad	4.75@5.00	Rio	**12.00**
St. Lucia	4.75@5.00	Santos*	12 00@12 84
St. Thomas	4.25@4.75	Montevideo	12.00@13.20
Barbados	4.75@5.00	Buenos Aires or La Plata†	12.00@13.20
Kingston	4.00@4.25	Rosario	13.20@16.20
Curacao	**4.50**	West Coast of Italy	21.60
Santiago	4.00@4.25	Barcelona**	19.20@21.60
Guantanamo	4.00@4.25	Valparaiso or Callao	11.00@13.00
Demerara	6.50@7.00	Marseilles	20.40@21.60

* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British steamers; neutral steamers are more difficult to obtain and the rates are always higher.

W. W. Battie & Co.'s Coal Trade Freight Report.

Note—Figures in **bold face** type are only approximate.

OHIO VALLEY

PITTSBURGH

Conditions in market unchanged, end of lake season postponing improvement due to better consumption. Slack firmer. Heavier consumption in the steel industry.

The local coal trade has not received any material backset through the termination of the Lake shipping season; rather the influence of the shutting off of this outlet has chiefly served to delay any improvement in conditions that otherwise would have become observable. The feeling in the coal trade is distinctly that there will be heavy demand in the next few months, up to Apr. 1 as many consumers are expected to stock coal, and the regular consumption is certain to be large, probably higher than in any previous winter.

The iron and steel industry continues to run under the highest possible pressure, with no possibility of a decrease for many months, and as capacity has been increased somewhat since the last period of activity the current consumption of coal is above the previous record. Manufacturing establishments generally are running well, and operations are increasing. Domestic demand is fair and with the people generally prosperous, domestic consumption of coal will undoubtedly be heavier by a considerable percentage than last winter.

The Pittsburgh district even up to date has felt scarcely any influence from the war demand; even with the shutting off of Lake shipments local operators do not seem to be in position to name the prices necessary to take export business. Car supplies are unsatisfactory but while there is much complaint there is no very serious inconvenience. As empties come back from the Lakes the situation will doubtless be relieved.

Slack is still firmer. We quote free coal as follows: Slack, 95c.@$1; nut, $1.15; mine-run, $1.15@1.20; ¾-in., $1.25@1.35; 1¼-in., $1.35@1.45; on contract to Apr. 1: Slack, $1@1.05; nut, $1.25; mine-run, $1.25@1.35; ¾-in., $1.35@1.40; 1¼-in., $1.45@1.55, per net ton at mine, Pittsburgh district.

BUFFALO

Great activity in slack. All bituminous shippers short of coal. Prices erratic and difficult to quote. Anthracite improving slowly.

Bituminous—The chief feature of the market is the sudden scarcity of Allegheny Valley slack, which is so nearly out of the market that some shippers have withdrawn all quotations. The closing of the Lakes usually throws a surplus of slack on the market and weakens the price but consumers are apparently taking more coal than formerly and are getting anxious over the future supply.

It is reported that the trade in central New York and eastward is taking a large amount of mine-run, while Pittsburgh and Clearfield are staying out of this market on account of their heavy shipments to Tidewater. Even Canada is bidding up on slack and last week paid as high as $1.35 for Allegheny slack on a $1.10-rate.

Only approximate quotations are possible as follows:

	Pittsburgh	Allegheny Valley	Penn Smokeless
Lump	$2.80	$2.50	$2.55
Three-quarter	2.65	2.30	.....
Mine run	2.55	2.20	2.30
Slack	2.15	2.10	2.30

Quotations are f.o.b. cars at Buffalo or the Niagara bridges and per short ton except east of Rochester or Kingston, Ont.

It is a long time since the bituminous market was in such an unquotable shape. Shippers will not consider contracts and are hardly willing to take single orders except where they have their own mines.

Anthracite—The trade improves steadily, but is not as active as it should be at this time of the year. Chestnut is selling well, but is much less active than usual. Egg is moving slow and it is difficult to get rid of it as fast as it accumulates. Independent anthracite is about normal; full circular prices are obtained, but seldom any premium.

Prices, f.o.b. Buffalo per long ton are $5.60 for grate, $5.85 for egg and stove, $6.10 for chestnut, $4.30 for pea, $3.25 for buckwheat, $2.75 for rice, $2.50 for barley and $2.50 for screenings, with 25c. a ton additional for delivering on board Lake vessels.

Lake shipments for the week dropped to 79,076 tons, but the decline was mostly on account of the storms and the scarcity of tonnage, vessels now going out light for grain, if at all. Shipments for November were 443,900 net tons and for the season, 3,757,146 tons, as against 4,292,510 tons to December last season.

TORONTO, CAN.

Revival in industrial enterprises stimulates the coal business. Car shortage expected to improve shortly.

Trade has been active in all lines and with the marked revival of manufacturing activity dealers are looking forward to a busy season. There is some diminution of supplies on hand owing to delayed deliveries due to car shortage, but dealers expect that this difficulty will very shortly be lessened by the closing of navigation diverting railway traffic from the Lake ports to other routes.

Soft coal screenings are still somewhat scarce. Prices are generally well maintained and are as follows, per short ton, for best grades: Retail, anthracite egg, stove and nut, $7.75; grate, $7.50; pea, $6.50. Bituminous, retail, steam, $5.25; screenings, $4.25 to $4.50; domestic lump, $6; cannel, $8. Wholesale, f.o.b. cars at destination, three-quarter lump, $3.79; screenings, $3.15.

COLUMBUS

Increased demand for domestic sizes. Steam business is still good and the circular well maintained. Large number contracts expire Jan. 1.

Colder weather has stimulated the domestic market. Buying of Hocking grades for immediate shipment was the feature of the week. Retailers' stocks were light and a rush of small business made it necessary for them to replenish their stocks. Because of the car shortage in West Virginia, Ohio operators received a larger share of the business then formerly; production in some West Virginia fields is reported far below normal. Retail prices remain firm.

Small sizes are very strong, and there was some inconvenience due to the shortage of nut, pea and slack and coarse slack. Prices are nearing the $1 mark. Railroads are still storing fuel but the larger part of the movement is over. Many steam contracts expire at the first of the year. Sales managers are concentrating their attention on renewals. Indications are that prices on this business will be slightly higher than a year ago.

Anthracite is selling well in central Ohio territory. Prices are firm at former levels.

Prices in Ohio fields f.o.b. mines, per short ton, are as follows:

	Hocking	Pomeroy	Eastern Ohio	Kanawha
Re-screened lump	$1.60	$1.65	.....	.....
Inch and a quarter	1.50	1.50	$1.35	$1.50
Three-quarter-inch	1.35	1.40	.....	1.35
Nut	1.25	1.30	.....	1.25
Mine-run	1.15	1.20	1.05	1.10
Nut, pea and slack	.85	.90	.80	.75
Coarse slack	.75	.80	.70	.65

Mines have been working at about the following percentages of full capacity:

District	Week Ended				District	Week Ended			
	Nov. 13	Nov. 20	Nov. 27	Dec. 4		Nov. 13	Nov. 20	Nov. 27	Dec. 4
Hocking	50	60	50	60	Cambridge	70	75	70	75
Jackson	40	45	40	50	Massillon	70	75	60	70
Pomeroy	85	85	80	85	Eastern O.	75	80	75	80
Crooksville	65	65	60	70	Average	65	69	62	70

TOLEDO

Manufacturers supplies light. Slack coal fluctuating badly. Cars short, but no congestion as yet.

The steam trade is strong and prices are holding very close to the list, for the most part, while slack coal can scarcely be quoted. Last Saturday, quotation on West Virginia slack was around 85c.; Hocking from 85@90c., and Kentucky slack around 90c. with Pittsburgh No. 8 from 85@90c. Pocahontas egg is strong but lump is a trifle weak due to the excessive demand for egg and slack.

The Lake movement is commencing to slow down and is now confined mostly to cleaning up stocks. There is a marked car shortage but as yet there is no congestion at Toledo. Local dealers are fairly well stocked and manufacturing plants have fair supplies.

Prices f.o.b., mine, per short ton are as follows:

	Pocahontas	West Virginia	Hocking	Pomeroy	Jackson	Kentucky	Pitts. No. 8
Lump	$2.25	$1.60@1.85	$1.60	$1.75	$2.50	$2.00	$1.35
Egg	2.25	1.00@1.25			2.50	1.80	1.20
Mine-run	1.40	.85@1.00	1.10	1.10		.90@1.00	1.10
Nut	1.75	1.00@1.15	1.25	1.85		1.10@1.25	

CLEVELAND

Closing of the Lake season has thrown a large tonnage of coarse coal on the market. Slack coal in short supply.

The Lake business has practically closed for 1915 with but a few cargoes yet to go. Shippers who had coal left over had to turn it on the local markets, and as Lake coal is almost entirely ¾-in. screened, it has a comparatively small outlet. The price did not suffer, but sales hardly made an impression and reconsignments from other lake ports materially overstocked the market.

The high prices being paid in the East have prevented any Pennsylvania fine coal coming into this market and quotations on Youghiogheny are nominal as local brokers are not in the market at the prices quoted. Receipts of fine coal were very light over Sunday with prices considerably stronger. The activity in fine coal is due to the fact jobbers and operators have only enough for their contract trade to run the plants three or four days, which is too narrow for a safe working basis.

The retail trade has been good. The weather has not been extremely cold for this time of the year, but it has been necessary to keep up good fires.

Jobbers are paying the following prices f.o.b. Cleveland per short ton:

	Pocahontas	Youghiogheny	Bergholz	Wainwright	No. 8
Freight	$1.45	$1.00	$0.70	$0.70	$0.90
Lump	3.35@3.40	.....	.....	....	.....
Lump, 6 in	....	.....	2.30	....	.....
Lump, 1¼ in	....	2.40	2.10	2.30	2.05
Lump, ¾ in	....	2.30	2.00	2.10	1.90
Lump, 3 in	....	.....	.....	2.40	.....
Egg	3.35@3.40	.....	.....	....	.....
Mine run	2.70	2.15	1.90	1.95	1.80
Slack	....	2.00	1.85	1.80	1.80

DETROIT

Steam coal buying continues steady. Inquiry for domestic coal and anthracite improves. Railroad embargo removed.

Bituminous—Buying of steam coal continues with gratifying regularity. Small sizes are the most popular and shippers and jobbers are finding the problem of supply creates perplexities. Domestic coal is moving more freely, and the weather iis sufficiently frosty to give strength to the market. Shippers are beginning to participate in the improvement. Car shortage and unusually pressing demands for railroad equipment to move other commodities is slowing down deliveries. The embargo declared by the Grand Trunk railroad, Nov. 16 was removed; Dec 4. Prices on slack and mine-run range between 75 and 90c. a ton. Three-quarter West Virginia lump is $1@1.10, Jackson Hill domestic lump $2.50, Hocking domestic lump $1.50 and smokeless egg and lump holds at $2.25.

Anthracite—In the anthracite trade, low temperatures have increased business for retailers, but has benefitted shippers only to a minor degree. Car shortage and the restrictions on the Grand Trunk tend to curtail and delay deliveries. Lake shippers are paying a premium of about 15c. a ton over the season rate of 30c. on shipments to Lake Superior ports.

CINCINNATI

Colder weather and continued car shortage has strengthened the market materially. Prices firm and tending toward higher levels.

The coldest weather of the season has steadied up the retail market, in an impressive manner. The inquiries increased materially, and although the actual movevent was not large, the situation has undoubtedly improved. There is still much coal in the hands of retail dealers, but the end of these supplies is in sight. Industrial consumption is also better than at any time this year, as the larger consumers are finding it necessary to use the maximum amount of coal.

Demand is excellent everywhere and the car shortage is the most serious problem at the present time. There is little prospect of immediate improvement in this respect, although the railroads and coal interests are exerting every effort to accelerate the movement.

LOUISVILLE

Demand stiffening due to lower temperatures and improved industrial situation.

The advancing winter is making the demand for domestic coals better and the steam sizes are also stiffening. Mines are operating on a full schedule, while through the eastern section coking plants are resuming. The fact that Pittsburgh is shipping little or no domestic coal into this market has been a good influence on the local business. Eastern Kentucky block coals are bringing, f.o.b. mines, long ton basis, from $1.65 up to $2.25, the latter being for fancy coals, while nut and slack ranges from about 50 to 80c. in a few cases.

COKE

CONNELLSVILLE

Coke market colorless, with no change in prices and no definite outlook. Production and shipments practically unchanged.

The coke market continues to drag. There is very little demand for prompt furnace coke and scarcely any inquiry against contracts for the new year. Shipments on current contracts seem to be adequate for the requirements of the furnaces. The coke trade has no definite theory as to the course of prices in the next few months. The sharp advances in pig-iron prices that are occurring almost daily give the market a favorable aspect from one viewpoint, but another viewpoint is that pig-iron prices are advancing not so much on account of heavily increased demand as because production cannot be further increased, there being scarcely any idle furnaces, and if there are no idle furnaces to blow in there can hardly be an increased consumption of coke, and increased consumption apparently is needed to advance prices.

Present quotations for prompt coke are about on a level with contract prices already made for next year, so that the outlook is not for any material change. A flurry over the holidays is of course always expected. We quote: Prompt furnace, $2.15@2.25; contract furnace, first half, $2.35@2.50; year 1916, $2.25@2.35; prompt and contract foundry, $2.90@3.25, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Nov. 27 at 432,341 tons, a decrease of 1,061 tons, and shipments at 435,084 tons, an increase of 4,327 tons.

Buffalo—The market is not quite so strong locally, though oven quotations are still on the basis of $5 for best 72-hr. Connellsville foundry, with no actual stock coke to be had, some 48-hr. being sold instead at $4.20. Some ovens are quoting as high as $5.20 for foundry. Consumption increases, but the output sometimes exceeds the demand.

Chicago—In the face of rising prices the demand remains undiminished. Eastern tonnage now being sent into this market is much greater than at any previous time. Spot coke is bringing a premium of at least 50c. per ton. Some long-term contracts are being negotiated. Byproduct domestic sizes are easier. Prices per net ton, f.o.b. cars Chicago, are as follows: Byproduct, foundry, $5.25@5.75; byproduct, domestic, $4.75@5; Connellsville, $5.25@5.75; Wise County, $5.25@5.50; gas coke, $4@4.25.

MIDDLE WESTERN

GENERAL REVIEW

Domestic consumption improved. Fine coals in brisk demand. Activity of steam grades noticeable. Smokeless products and anthracite weak.

Activity has characterized all branches of trade during the past week. Freezing temperatures have ruled over the Western country, and the absorption of domestic sizes has gained momentum. Prices are responding to the improved conditions, and sales of Western coals are generally close to the circular. West Virginia smokeless grades and anthracite are about the only weak features of an otherwise strong market. Steam and domestic sizes are in about equal demand.

Belated orders from country dealers are reaching many wholesalers and another week of all-around activity will bring about concerted action on the matter of advancing prices. Certain large consumers foresee an era of higher prices for steam coal, and are taking measures to cover their requirements. Storage by Western railroads has not yet reached the proportions expected, and it is reported that several carriers who have not yet taken any action on this matter are negotiating for large quantities to be put in storage at a convenient season. Some public utility corporations are seeking to make contracts for steam coals over periods of two and three years' time.

CHICAGO

Fair tonnage moving. Smokeless market congested. Indiana and Illinois coals arriving in moderate volume.

Franklin and Williamson County domestic lump shipments have increased to the country dealers; egg and nut are slow but steam lump is steady, and screenings are active. Harrisburg and Saline County domestic lump shipments are rather slow; steam lump orders have not been fully satisfied, while screenings are short and selling at a premium. Some Southern Illinois spot domestic lump and egg has been sold at $1.50 during this week, but this surplus is now all cleaned up.

Springfield domestic lump shipments are better, due to the fact that two large producers are out of the market at the present time. Considerable coal is moving from this district for raiload storage. Sceenings are brisk.

There is considerable activity in Fourth Vein coal of all sizes; Third and Fifth Vein steam lump shipments are steady, with demand for domestic lump increasing. Sullivan County Sixth Vein domestic shipments are larger, but egg and nut from this district are still torpid. Greene County lump is quiet. All Indiana free screenings are absorbed at maximum prices.

The West Virginia smokeless market is somewhat demoralized owing to the arrival of a considerable tonnage of lump and egg intended for shipment by the Lakes. Mine-run has been sympathetically affected by this situation. Considerable lump and egg has sold as low as $1.40, and mine-run dropped to $1.15 in some cases. Pennsylvania mine-run shipments are limited, while slight recessions are noted in the demand for lump and egg, nut being active.

The market for Hocking coal, which has been soft for several weeks, is much improved. Lump in limited quantities is sold at the full circular price of $1.60.

Over 100 cars of anthracite accruing demurrage were sold this week at some concession in price in order to get the coal off the market.

Quotations in the Chicago market are as follows, per net ton f.o.b. mines:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump	$1.60@1.75	$1.60@1.75	$1.60@1.75	$1.60@1.75	$1.40@1.60
Steam lump	....	1.25@1.35	1.25@1.35	1.20@1.35	1.25@1.35
2½ and 3-in. lump	....	....	1.35@1.50	1.50@1.60	1.30@1.45
1¼-in. lump			1.25@1.35	1.15@1.25	..
Egg	1.60@1.75	1.50@1.65	1.20@1.30	1.25@1.35	1.25@1.35
Nut	1.60@1.75	1.60@1.65	1.05@1.20	1.20@1.35	1.10@1.25
No.1washed	1.60@1.75	....	1.50@1.75	....	....
No.2washed	1.40@1.50	....	1.40@1.65	....	....
No. 1 nut	1.60@1.75	....	....	....	....
No. 2 nut	1.40@1.50				
Mine-run	1.10@1.15	1.05@1.10	1.00@1.10	1.10@1.20	.95@1.10
Screenings	.75@.80	.65@.75	.70@.75	.70@.80	.75@.85

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.60@1.75	$1.50@2.40	$1.85@2.25	$1.90@2.25	$1.50@1.85
1¼-in. lump	1.25@1.35	....	....	....	1.35
Egg	1.60@1.75	1.40@2.00	2.00@2.25	1.90@2.25	1.00@1.25
Nut	....	1.25@1.65	1.65@1.75	1.40@1.60	....
No. 1 nut	1.60@1.75	....	....	....	....
No. 2 nut	1.40				
Mine-run	1.15	.90@1.15	1.25@1.40	1.25@1.40	1.15@1.25
Screenings	.70@.75	.75		....	.60@.70

Kanawha splint lump, $1.50@1.90.

ST. LOUIS

Demand improving. Screenings in short supply. Domestic trade waiting colder weather.

There is a gradual improvement in the industrial demand. There are not enough screenings to supply the requirements and the price was forced up at the end of the week to 55@60c. for Standard and Staunton and 65@70c. for Franklin and Williamson County. There has not been sufficient change in the weather to quicken the domestic demand.

Quotations f.o.b. mines during the past week have ranged on the following basis per short ton:

	Frnk. Co.	Wlmson. Co.	Staunton	Standard
6-in. lump	$1.50@1.65	$1.50@1.65	$1.25	$1.00@1.15
8-in. lump	....	....	....	.90@1.15
2-in. lump	....	....	1.15	1.00
3x6 egg	1.40@1.65	1.40@1.65	....	1.00
2x6 egg	....	....	....	.85
No. 1 nut	1.50@1.75	1.50@1.75	....	.75@1.00
No. 2 nut	1.25@1.50	1.25@1.50	....	.70@.85
No 1 washed	....	1.40@1.50	1.40@1.50	....
No 2 washed	....	1.25@1.40	1.25@1.40	....
No. 3 washed	....	1.15@1.25	1.15@1.25	....
No. 4 washed	....	1.15@1.25	1.15@1.25	....
No. 5 washed	....	.75@.85	.75@.85	....
Screenings	.65@.70	.65@.70	.55@.60	.55@.60

Freight Rates—Inner group, St. Louis, 57½c., East St. Louis, 37½c.; outer group, St. Louis, 72½c.; East St. Louis, 52½c.

DULUTH

Cold weather stimulates buying. Good movement of all grades. Prices firm.

There was a steady demand for all the grades of bituminous coal during the past week. The weather was moderately cold and the retailers and householders bought heavily. A large number of orders were received by the various dock companies, which have been working full time to satisfy the demands of the trade. Receipts have been quite heavy recently, the companies putting forth every effort to get as much coal forward as possible before the close of navigation, which is likely to occur at any time. Prices remain firm. Quotations per short ton f.o.b. cars at the Duluth docks are as follows:

	Yough	Splint	Hock	Smokeless	Elkhorn
Lump	$3.40	$3.40	$3.40	$4.75	$3.75
Dock run	3.10	3.10	3.10	3.25	3.25
Egg, stove and nut	3.40	3.40	3.40	4.75	3.65
Screenings	2.40	2.40	2.25	2.75	2.55

Anthracite business during the past week has been very good, the cold weather being responsible for a large number of "hurryup" orders. Prices are as follows: Nut, $7.10, stove and egg, $6.85, pea, $5.55 and buckwheat, $4, all per short ton f.o.b. cars at Duluth docks.

PRODUCTION AND TRANSPORTATION STATISTICS

NORFOLK AND WESTERN

Destination of shipments over this road for October and the ten months of this year and the last year were as follows, in short tons:

	October		Ten Months	
Coal	1914	1915	1914	1915
Tidewater, foreign	98,839	361,883	1,686,391	3,426,479
Tidewater, coastwise	302,297	234,623	3,220,081	2,673,915
Domestic	1,596,703	2,467,395	17,071,474	18,597,536
Coke				
Tidewater, foreign	....	4,511	339	27,591
Domestic	63,625	85,618	870,729	730,816
Total	2,061,464	3,154,030	22,849,014	25,456,337

MIDDLE WESTERN ROADS

The following is a comparative statement of coal handled over the 17 principal Middle Western carriers for September, and the first nine months of this year compared with the same periods last year:

	September		9 Months	
	1914	1915	1914	1915
Illinois Central	790,221	785,514	5,564,866	5,419,904
C. & E. I. R.R.	622,905	656,194	4,956,424	4,406,854
C., B. & Q. R.R.	613,729	645,614	4,077,357	3,955,925
C., C., C. & St. L. R.R.	484,695	488,694	3,532,238	3,639,923
Vandalia Line	444,340	430,638	3,228,842	3,502,753
C., T., H. & S. E. Ry.	282,944	258,567	2,228,919	2,192,756
C. & A. Ry	153,430	189,029	1,276,759	1,391,545
Wabash R.R.	166,550	146,595	1,104,377	1,135,716
St. L., I., M. & S. Ry.	167,024	169,047	1,145,792	1,145,776
Southern Ry	94,965	127,633	1,114,007	832,923
B. & O. S. W. R.R.	99,767	93,110	565,175	716,641
St. L., T. & E. R.R.	67,631	52,908	495,879	433,571
St. L. & O. F. Ry.	52,227	54,560	386,595	455,102
L. & M. Ry	63,332	42,835	359,630	342,275
C., I. & L. Ry	43,268	61,866	425,873	487,944
C., P. & St. L. Ry.	36,343	44,761	257,587	304,835
C. & N. W. Ry	36,721	33,407	240,231	296,311
Totals	4,220,092	4,280,972	30,960,651	30,660,754

I. C. C. No. 6080—Elmore—Benjamin Coal Co., Et Al. vs. Chesapeake & Ohio Ry. Co., Et. Al.

Through rates on coal in carloads from the Kanawha and New River, W. Va., fields on lines of the Chesapeake & Ohio Railway Company to Milwaukee, Wis., not found to be unreasonable. Request for joint rates denied. Complaint dismissed.

CHICAGO LAKE RECEIPTS

Coal receipts at the port of Chicago and South Chicago, classifield according to shipping points, for the month ending Nov. 30, 1915, midnight, were as follows:

	1915		1914	
From	Hard	Soft	Hard	Soft
Buffalo	64,918		97,798	
Oswego	11,364		22,708	
Ashtabula		58,547	7,200	6,980
Sandusky		42,734		
Cleveland		39,695		19,832
Toledo		34,726		6,000
Fairport		10,015		
Erie	14,000			
November total	90,282	185,717	127,701	32,812
Season total	777,179	897,389	782,214	604,722

FOREIGN MARKETS

GREAT BRITAIN

Nov. 26—Tonnage arrivals are more ample and there is a prospect of a more active market. Quotations are approximately as follows:

Best Welsh steam	Nominal	Best Monmouthshires	$4.44
Best seconds	Nominal	Seconds	4.32
Seconds	$4.44	Best Cardiff smalls	2.82
Best dry coals	5.64	Cargo smalls	1.92

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—Rates continue to rise and are approximately as follows:

Gibraltar	$5.79	Naples	$11.00	St. Vincent	$7.80
Marseilles	11.82	Alexandria	13.20	River Plate	9.60
Algiers	11.00	Port Said	13.20		
Genoa	12.48	Las Palmas	7.20		

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

+Indicates contracts regarding which official information has been received.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

424—St. Louis, Mo.—This contract (Vol. 7, p. 568), which provides for the requirements of the Continental Portland Cement Co., will be negotiated about the twenty-fifth of each month. Approximately 4,000 tons of Carterville 1½-in. screenings per month are required for charging the kilns. The power plant of the company has been electrified. Address Pur. Agt., J. P. Terpenny, The Continental Portland Cement Co., Syndicate Trust Bldg., St. Louis, Mo.

1455—New Orleans, La.—This contract (p. 530), which provides for furnishing the Hotel De Soto with its annual fuel requirements, involving approximately 130 tons per month, will be awarded about the first of the year. Address Gen. Mgr. Vic Le Beau, Hotel De Soto, Baronne and Poydras St., New Orleans, La.

1581—New Orleans, La.—This contract (p. 700), which provides for furnishing the Leland Steamship Co. with approximately 50,000 tons of steam coal, will not be negotiated until toward the close of January. Address Purchasing Agent Leland Steamship Co., 1210 Hibernia Bank Bldg., New Orleans, La.

1643—Birmingham, Ala.—The customary price at which this contract (p. 870), which provides for furnishing the Birmingham Railway, Light and Power Co. with approximately 20,000 tons of coal is negotiated, is about $1.50 per ton. The business is let on competitive bids. Address Pur. Agt., Chas P. Doerr, Birmingham Railway, Light and Power Co., Birmingham, Ala.

1667—Ironton, Ohio—No bids were received on this contract (p. 912), which provides for furnishing the coal for the local pumping station, and readvertisements will be made, the date of opening the new bids to be Dec. 16. Address Clk. F. A. Ross, Bd. of Pub. Service, Ironton, Ohio.

1679—New York, N. Y.—Bids have been received on this contract (p. 912), which provides for furnishing anthracite and bituminous coal to the various public buildings, courts, etc., in the Borough of Manhattan, as follows:

	Buckwheat				
	No. 1	No. 2	No. 3	Broken	Mine-Run
Gavin Rowe (a)......	$1.72½	$1.50	$1.31	$2.79	$2.11½
Wm. Farrell & Son (b)	4.99	4.49	3.99	5.99	6.50

(a) These bids are on 1,000 lb. units. (b) These bids are on 2,000 lb. units. Address Pres. Marcus M. Marks, Room 2,032, 20th Floor, Municipal Bldg., New York, N. Y. (No. 19, **Vol. 6**, p. 892).

New Business

Volume and page number in parenthesis at the end of an item indicate where the previous announcement, bids and awards on that contract may be found.

1712—Pottstown, Penn.—The Wilbrahame Green Blower Co. usually send out inquiries on their annual fuel contract on Dec. 1, and close the business on Jan. 1. They consume about 600 tons per annum, and deliveries are by Philadelphia & Reading Ry. Address Pur. Agt. James, Wilbrahame Green Blower Co., Pottstown, Penn.

.1713—Pottstown, Penn.—The McClintic-Marshall Construction Co. usually contract for their annual fuel requirements, involving approximately 1,200 tons, on Jan. 1. Address Pur. Agt. Corbett, the McClintic-Marshall Construction Co., Pottstown, Penn.

+1714—Detroit, Mich.—The Board of Public Works will receive bids until 10 a.m., Dec. 31, for furnishing coal as follows: Steam coal, 2,000 tons of either mine-run or three-quarter lump for use at the Asphalt Plant to be delivered f.o.b. cars in the Western district yards; 50 tons of same to be delivered in wagon lots on the Belle Isle Bridge; 1,800 tons of three-quarter lump delivered in wagon lots at Fairview Pumping Station; 30 tons Jackson Hill three-quarter lump, to be delivered in wagon lots at the yard or barn, as directed. Anthracite—25 tons each of chestnut, stove and chestnut mixed in equal proportions, stove and egg coal, to be delivered at the yard or barn, as directed. Pocahontas lump—approximately 100 tons, to be delivered f.o.b. cars Eastern or Western district yards. Bidders are required to file a certified check for $1,000 with bids. Address Comr. Geo. S. Finkle, Dept. of Pub. Wks., Detroit, Mich. (Vol. 7, pp. 189, 231.)

+1715—Austin, Tex.—The Water and Light Dept. at this place usually contract for its annual fuel requirements, involving approximately 60 tons of lignite coal per day, about Jan. 1. The business is done on competitive bids, and the customary price is about $1.48 per ton. Address Supt. E. C. Bartholomew, Water and Light Plant, Austin, Texas.

1716—Reading, Penn.—The Reading Hardware Co. usually contract for their annual fuel requirements, involving approximately 5,000 tons, on Jan. 1. Address Pur. Agt. Isaac Treat, Reading Hardware Co., Reading, Penn.

1717—Reading, Penn.—The Penn Hardware Co. at this place usually contracts for its annual fuel requirements, involving approximately 3,000 tons, on Dec. 1. Address Purchasing Agent, Penn Hardware Co., Reading, Penn.

1718—Robesonia, Penn.—The Robesonia Iron Co. usually contract for their annual fuel requirements, involving approximately 35,000 tons, on Jan. 1. They also require some low phosphorus 42-hr. coke. Deliveries are made by Philadelphia & Reading Ry. Address Supt. S. B. Pattison, Robesonia Iron Co., Robesonia, Penn.

1719—Riverside, Penn.—Wm. F. Taubell, Inc., usually contract for their annual fuel requirements, involving approximately 8,000 tons, on Jan. 1. Address Pur. Agt. Wells, W. F. Taubell, Inc., Riverside, Penn.

1720—Salem, N. J.—The Gayner Glass Works usually contract for their annual fuel requirements, involving approximately 4,000 tons on Jan. 1. The company ordinarily uses South Fork coal. Address Pur. Agt. Gayner, the Gayner Glass Works, Salem, N. J.

1721—Salt Lake City, Utah—Bids were received until 3 p.m., Dec. 8, for furnishing the Utah State Prison with approximately 100 tons of lump, and 600 tons of screened slack coal during the ensuing year. Deliveries are to be f.o.b. track at the State Prison. All bidders must submit a certified check for 5 per cent. of the amount of their bids. Address Warden Arthur Pratt, Utah State Prison, Salt Lake City, Utah.

1722—Quenelda, Ala.—The Quenelda Graphite Co., usually contracts for its annual fuel requirements, involving approximately 1,560 tons of bituminous coal, about Jan. 1. Deliveries are made by railroad at the rate of about 130 tons per month, and the company has storage capacity for 150 tons. Address Pur. Agt. J. Warren May, Quenelda Graphite Co., Quenelda, Ala.

1723—Russellville, Ky.—The Light and Power Dept. at this place usually contracts for its annual fuel requirements, involving approximately 2,880 tons of bituminous mine-run, about Jan. 1. The business is done on competitive bids, and the customary price is about 87½c. per ton. Address Clk. C. W. Andrews, The Light and Power Co., Russellville, Ky.

1724—Minneapolis, Minn.—The Electric Short Line Ry. Co. at this place usually contracts for its annual fuel requirements, involving approximately 2,200 tons of Youghiogheny dock-run, about Jan. 1. Deliveries are made by railroads at the rate of six cars per month, and the company has storage capacity for 150 tons. Address Gen. Mgr. D. K. Hunter, Electric Short Line Ry., 809 Phoenix Bldg., Minneapolis, Minn.

1725—Chambersburg, Penn.—The Wolf Co. at this place usually contracts for its annual fuel requirements, involving approximately 2,250 tons of bituminous mine-run coal, about Jan. 1. Deliveries are made by railroad at the rate of one car per week, and the company has storage capacity for 300 tons. Address Pur. Agt. Frank Duncan, The Wolf Co., Wolf St., Chambersburg, Penn.

1726—Elkhart, Ind.—The Elkhart Bristol Board and Paper Co. are in the market for approximately 3,500 tons of West Virginia mine-coal coal, deliveries to start Feb. 1 and to be made in regular weekly proportions. Address Pres. C. E. Frye, The Elkhart Bristol Board and Paper Co., Elkhart, Ind.

+**1727—Denver, Colo.**—The City Government will receive bids until 10 a.m., Dec. 13, for furnishing coal, to be delivered in carload lots, at the municipal coal yard, corner of 19th and Kalamath St., of the following grades: Northern Colorado lignite; Canon City or Walsenburg bituminous; anthracite; Routt County. Bids will also be received for furnishing and delivering coal from the same fields to the various city departments. On the business providing for carload deliveries, shipments must be made within 24 hr. of the receipt of the order, and on the business to be delivered to the various city departments, such delivery must be made within 24 hr. The successful bidder on either of these specifications will be required to furnish a bond for $5,000. Address Comr. Clair J. Pitcher, Room 209, City Hall, Denver, Colo.

+**1728—Cambridge, Mass**—The Cambridge Water Board received bids until 11 a.m., Dec. 7, for furnishing the local pumping station with approximately 1,000 long tons of coal during the next six months. Deliveries, if by rail (Boston & Maine R.R.), are to be made immediately, and if by team are to be made at the rate of ten tons per day, beginning Dec. 14. The successful bidder will be required to furnish a bond for 25 per cent. of the amount of the contract. Address Gen. Supt. Edward W. Quinn, Cambridge Water Works, Cambridge, Mass.

1729—Kansas City, Mo.—The Abernathy Furniture Co. at this place will contract about Jan. 1 for its annual fuel requirements for both the Kansas City and Leavenworth branches. The company uses about one carload per week of Cherokee slack at the Kansas plant and about half as much at the Leavenworth. Address Purchasing Agent, Abernathy Furniture Co., Kansas City, Mo.

1730—Uhrichsville, Ohio—The Evans Clay Manufacturing Co. at this place are in the market for a tonnage of West Virginia, Pennsylvania or Kentucky bituminous lump coal. Address Purchasing Agent, The Evans Clay Manufacturing Co., Uhrichsville, Ohio.

+**1731—New Orleans, La.**—The City Government will soon request bids for its annual fuel supply, involving approximately 15,000 short tons of coal, for the various city buildings and departments. The present contract is held by the Tennessee Coal, Iron and R.R. Co. and expires on Jan. 28, the business having been taken at $3 per short ton for Pratt mine-run and $3.25 for Cahaba egg coal. The successful bidder will be required to furnish a bond for $500. Address Commissioner of Police and Public Buildings, Room 27, City Hall Building, New Orleans, La.

1732—Lima, Ohio—The Solar Refining Co. at this place will be in the market early in January for its annual fuel requirements, involving approximately 45,000 tons of mine-run, and 30,000 tons of nut and slack coal. Address Pres. J. G. Neubauer, The Solar Refining Co., Lima, Ohio.

1733—Union City, Mich.—The Peerless Portland Cement Co. at this place usually contracts for its annual fuel requirements, involving approximately 10,000 tons of three-quarter lump and 35,000 tons of coarse slack coal, about Jan. 1. Deliveries are made by rail at the rate of about 40 tons of lump, and 110 tons of slack per day. The company has storage capacity for 1,800 tons. Address Mgr. W. M. Hatch, Peerless Portland Cement Co., Union City, Mich.

1734—De Queen, Ark.—The De Queen Ice and Light Co. at this place usually contracts for its annual fuel requirements, involving approximately 2,000 tons of slack and crushed mine-run coal, about Jan. 1. The business is done on competitive bids, and usually goes at $2.50 per ton for the slack and $3 for the mine-run. Address Purchasing Agent, The De Queen Ice and Light Co., De Queen, Ark.

1735—Tarentum, Penn.—The Borough Light Plant at this place usually negotiates its annual fuel contract, involving approximately 3,000 tons of mine-run coal, about Jan. 1. The business is usually let at about $1.50 per ton, and is done on competitive bids. Address Supt. J. C. Turner, Borough Light Plant, Tarentum, Penn.

1736—South Whitley, Ind.—The Light and Water Plant at this place usually contracts for its annual fuel requirements, involving from 1,500 to 1,800 tons, about Jan. 1. Bids are requested on different grades of steam coal, and a guarantee of the heat value must accompany each bid. Address Treas. F. E. Fox, Light and Water Plant, South Whitley, Ind.

1737—Philadelphia, Penn.—The Pennsylvania Salt Manufacturing Co. is in the market for its annual supply of anthracite rice coal, amounting to about 45,000 tons. Address Purchasing Agent, The Pennsylvania Salt Manufacturing Co., Widener Bdg., Philadelphia, Penn.

1738—Atlantic City, N. J.—The Atlantic City Gas Co. is in the market for its annual fuel requirements, involving approximately 10,000 tons of broken coal, delivery to begin Jan. 1. Address Superintendent, The Atlantic City Gas Co., Atlantic City, N. J.

1739—Philadelphia, Penn.—The W. J. McCahan Sugar Refining Co. is in the market for its annual fuel requirements, involving approximately 15,000 tons of anthracite buckwheat, delivery to begin Jan. 1. Address Purchasing Agent, The W. J. McCahan Sugar Refining Co., Tasker St., Delaware River, Philadelphia, Penn.

1740—Madison, Ill.—The coal contract of the International Cooperage Co., involving approximately 5 or 6 cars of Standard 2-in. lump coal per month, will expire on Dec. 31. The company has not yet decided upon how long it will contract for. Deliveries are made via the Terminal. Address Pres. Martin Snider, 911 Sweetland Bldg., Cleveland, Ohio.

1741—Philadelphia, Penn.—N. Snellenburg & Co. is in the market for its annual fuel requirements, involving approximately 10,000 tons of anthracite buckwheat coal. Deliveries are to be made at the company's warehouse at 10th and Berks St., during the year beginning Jan. 1. Address Purchasing Agent, N. Snellenburg & Co., 12th and Market St., Philadelphia, Penn.

1742—Milford, N. J.—The Crown Wall Paper Manufacturing Co., Inc., is in the market for its annual fuel requirements during the ensuing year, amounting to between 800 and 1,000 tons of bituminous coal. Address Purchasing Agent, Crown Wall Paper Manufacturing Co., Inc., Milford, N. J.

1743—Philadelphia, Penn.—The Baldwin Locomotive Works is in the market for about 7,000 tons of anthracite broken coal, delivery to be made during the year beginning Jan. 1. Address Purchasing Agent, The Baldwin Locomotive Works, Philadelphia, Penn.

1744—St. Louis, Mo.—The Wilson Stove Manufacturing Co. at this place is in the market for its annual fuel requirements, involving approximately 80 tons per month of 2-in. screened lump coal. Address Pur. Agt. S. H. Long, The Wilson Stove Manufacturing Co., St. Louis, Mo.

1745—Martins Ferry, Ohio—Bids will be received until noon, Dec. 13, for furnishing the Municipal Electric Light and Power Plant with its coal requirements during the ensuing year. From 3,000 to 4,000 tons of bituminous mine-run are required, and the usual price is around $1.45 to $1.50 per ton. Specifications may be had on application. Address Dir. E. Brown, Pub. Ser., Martins Ferry, Ohio. (No. 215, Vol. 7, p. 446.)

+**1746—New York, N. Y.**—The Department of Docks and Ferries will receive bids until noon, Dec. 20, for furnishing coal as follows: A mixture of 30% bituminous and 70% buckwheat, 15,000 tons to be delivered at St. George and 5,000 tons at 39th St., Brooklyn; for the Dock Department, 2,000 tons of No. 3 buckwheat. Address Comr. of Docks R. A. C. Smith, Pier "A," New York. (No. 1583, Vol. 8, pp. 700, 828.)

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

+**1215—Springfield, Ohio**—This contract (p. 245), which provides for furnishing the City Government with coal for the Water Works during the ensuing year, has been awarded to the **Chas. E. Grube Coal Co.**, at $2.38 per ton. Address City Mgr. Ashburner, Springfield, Ohio.

1457—Sharpsburg, Penn.—This contract (p. 530) which provides for furnishing the St. Mary's Church and various buildings of the Parish, has been awarded to **Walter Bros.**, at $1.70 per ton for mine-run coal. Address Rev. John Otten, 210 Penn St., Sharpsburg, Penn.

+**1605—Frankfort, Ky.**—This contract (p. 737), which provides for furnishing the Capitol Heating Plant, and other state buildings with coal during the ensuing year, has been awarded to the **R. A. Brawner Coal Co.** Address Custodian Samuel M. Lykins, Capitol Bldg., Frankfort, Ky.

1634—Granite City, Ill.—This contract (p. 870), which provides for furnishing the American Steel Foundry Co. with its annual fuel requirements, has been awarded as follows: **Mt. Olive & Staunton Coal Co.**, 2,500 tons of 1½-in. screenings per month; **Donk Bros. Coal and Coke Co.**, 600 tons of Nos. 3 and 4 washed coal per month; **Consolidated Coal Co.**, 150 tons of lump coal per month. No prices have been announced, but it is understood that screenings contract was closed at 60c. per ton. Address Pur. Agt. T. E. Moritz, American Steel Foundry Co., Chicago, Ill.

1649—Denver, Colo.—This contract (p. 871), which provides for furnishing the Mine and Smelter Supply Co. with a 30- or 40-ton car of Piedmont coal, has been awarded to the **Pennsylvania Coal and Coke Corporation.** Address Gen. Pur. Agt. W. B. Kinkead, The Mine and Smelter Supply Co., Denver, Colo.

1673—Muncie, Ind.—This contract (p. 912), which provides for furnishing the City Government with coal for use at the local Garbage Plant, has been divided between two parties as follows: **C. Taylor,** local agent for the Litz-Smith Fuel Co., of Huntington, W. Va., 4 to 6 cars of Shamrock Island Creek 1½-in. lump at $2.65 per ton, and the balance to **C. Cranor,** who will furnish Winifred ¾-in. lump at $2.75 per ton. Address City Clerk, Muncie, Ind.

+1682—Crosby, N. D.—This contract (p. 912), which provides for furnishing the local court house, jail and sheriff's office with coal during the year beginning Jan. 1, has been awarded to **T. S. Semingson** at $3.20 per ton for screened coal. Emil Simonet bid $3.25 per ton. Address County Audr. W. E. Vadnais, Crosby, N. D.

Contract Notes

Belleville, Ill.—The contract for furnishing the County Jail, Farm and Court House with coal during the ensuing year, has been awarded to **Louis Reuther** at $5.88 per hundred bushels.

Toledo, Ohio—The contract for furnishing the Toledo Railways and Light Co. with approximately 20,000 tons of high-grade West Virginia nut and slack coal, has been awarded to the **Wyatt Coal Co.**

New Britain, Conn.—The requirements of the Beaton & Cadwell Manufacturing Co. (p 960), have been covered until April of 1916. Address Pur. Agt. W. H. Cadwell, Beaton & Cadwell Mfg. Co., New Britain, Conn.

Auburn, Me.—The contract for furnishing Fitz Bros. at this place with approximately 500 to 800 tons of bituminous coal, has been awarded to **Pulsifer & Young.** The contract runs only to some time in the spring.

Canton, Ohio—The J. C. Niely Co. at this place are desirous of getting in touch with two or three good coal companies in that vicinity. Address Pur. Agt. J. C. Niely, The J. C. Niely Co., 900 3rd St., S. E., Canton, Ohio.

Worcester, Mass.—The General Supply Co. at this place require about 10 cars per month of anthracite and bituminous coal, deliveries being made by railroad. Address J. A. Hubbey, General Supply Co., 134 Exchange St., Worcester, Mass.

Buffalo, N. Y.—The requirements of the Ericsson Mfg. Co. (p. 960), involving approximately 1,200 tons of Youghiogheny three-quarter coal per annum, are covered until Sept. 1 of 1916. Address Pur. Agt. H. R. Dilks, Ericcson Mfg. Co., Buffalo, N. Y.

St. Louis, Mo.—The contract for furnishing Henry Gaus & Sons with approximately 100 tons of lump coal per month, has been awarded to the **Rutledge & Taylor Coal Co.** Address Pur. Agt. J. H. Ahrens, Henry Gaus & Sons, St. Louis, Mo.

St. Louis, Mo.—The contract for furnishing L. P. Bresh & Bro. with approximately 50 tons of lump coal per month was recently awarded to the **Lumaghi Coal Co.** on their "Black Brier" coal. Address Pres. L. P. Bresh, L. P. Bresh & Bro., St. Louis, Mo.

Buffalo, N. Y.—The Buffalo Southern Ry. Co. at this place consume about 3,000 tons of bituminous three-quarter lump per annum, deliveries being made by rail at the rate of about 250 tons per month. Address Pur. Agt. N. A. Bundy, Buffalo Southern Ry. Co., Buffalo, N. Y.

Effingham, Ill.—The contract for furnishing the Mullin-Blackledge-Nellis Co. with about two cars per week of egg coal has been awarded to the **Lumaghi Coal Co.** on their "Cantine" coal. Address Mgr. and Pur. Agt., A. J. Blackledge, Mullin-Blackledge-Nellis Co., Effingham, Ill.

St. Louis, Mo.—The contract for furnishing the St. Louis Paper Can and Tube Co., with about 90 tons of coal per month, has been awarded to the **Polar Wave Ice and Fuel Co.,** on Standard 2-in. lump coal. Address Pur. Agt., Kriechenmeister, St. Louis Paper Can and Tube Co., St. Louis, Mo.

St. Louis, Mo.—The contract for furnishing the Commonwealth Steel Co. with approximately 100 tons of 2-in. screenings per day, has been awarded to the **Breese Trenton Coal and Mining Co.,** on "Breese" screenings. Address Pur. Agt. Cartan, The Commonwealth Steel Co., St. Louis, Mo.

Highland, Ill.—The contract for furnishing the Lund-Maulding Shoe Co. with its annual fuel requirements, involving approximately 80 tons per month, has been awarded to the **Lumaghi Coal Co.,** on their "Cantine" 2-in. lump. Address Pur. Agt. R. L. Lund, Lund-Maulding Shoe Co., Highland, Ill.

Granite City, Ill.—The contract for furnishing the Draper Manufacturing Co. with approximately 80 tons per month of 2-in. screened nut coal, has been awarded to the **Lumaghi Coal Co.** on their "Cantine" coal. Address Pres. and Pur. Agt. C. L. Draper, Draper Manufacturing Co., Granite City, Ill.

St. Louis, Mo.—The contract for furnishing the Columbia Incandescent Lamp Co. with approximately 175 tons of No. 4 washed pea coal during the period from Nov. 1 to May 1, has been awarded to **Donk Bros. Coal and Coke Co.** Address Mgr. C. A. Dalton, Columbia Incandescent Lamp Co., St. Louis, Mo.

Sandusky, Ohio—The contract for furnishing the Sandusky Gas and Electric Co. with approximately five cars per week of West Virginia ¾-in. lump coal, was recently awarded to **Bert D. Smith** until Apr. 1, 1916. It is understood the coal will come from the Smithers Creek mine of the Sunday Creek Coal Co.

St. Louis, Mo.—The Boehmer Coal Co. will furnish the Union Electric Light and Power Co. with coal until Apr. 1 next. The Light and Power Co. has recently closed important large contracts for furnishing steam and electric power. Address, Pur. Agt. Union Electric Light and Power Co., St. Louis, Mo.

Alton, Ill.—No bids were received for furnishing the Madison County Poor with coal during the coming winter because the appropriation for this purpose has been exhausted. The orders will be distributed among local dealers who will have to carry their bills over until next spring. Address Postmaster Hermann, Alton, Ill.

St. Louis, Mo.—The contract for furnishing the Williams Patent Crusher and Pulverizer Co. with approximately 90 tons of Herrin No. 7 coal per month (p. 960), was awarded at $1.35 per ton. The contract expires in September of next year. Address Pur. Agt. W. J. Hanson, Williams Patent Crusher and Pulverizer Co., St. Louis, Mo.

St. Louis, Mo.—The contract for furnishing the Manchester Ave. Plant of the National Lead Co., with approximately 500 tons per month of 1½-in. screenings, has been awarded to the **Big Muddy Coal and Iron Co.;** the Collier plant will purchase its supply in the open market. Address Pur. Agt. W. M. Lowery, National Lead Co., St. Louis, Mo.

St. Louis, Mo.—The contract for furnishing the Wm. Waltke Soap Co. with approximately 125 tons per week of 2 in. screened nut coal has been awarded to the **Haddaway Curd Coal Co.** which is shut down temporarily, and the contract is being filled by the Northern Coal Co. Address Pres. and Pur. Agt. Wm. Waltke, Wm. Waltke Soap Co., St. Louis, Mo.

Louisville, Ky.—The Central Coal and Iron Co. concluded a five-year contract covering their annual fuel requirements involving from 1,000 to 1,200 tons of pea and slack coal in June of this year. Deliveries are made by wagon at the rate of 85 to 100 tons per month. Address Pur. Agt. P. M. O'Reilly, Central Coal and Iron Co., 4th and Market St., Louisville, Ky.

Rome, Italy—The sailing of the steamship "Kaupanger" from Philadelphia recently with 2,400 tons of anthracite, and 1,500 tons of coke for Genoa marked the inauguration of a new coal service with Italy. It is reported that many cities in Italy are suffering acutely from the lack of coal. The shortage is particularly serious in Trieste, where the price of illuminating gas has advanced considerably.

St. Louis, Mo.—The contract for furnishing the Mississippi Glass Co. with its annual requirements of coal involving approximately 120 tons per day of Carterville No. 1 washed nut for gas producer use, has been awarded to the **Peabody Coal Co.** at a price understood to be $1.25 per ton f.o.b. cars at washer. This coal carries a freight rate of 72½c. per ton. Address Pur. Agt., E. Wallace, Mississippi Glass Co., St. Louis, Mo.

St. Louis, Mo.—The contract for furnishing the St. Louis Screw Co. with its annual fuel requirements involving approximately 1,500 tons of No. 5 unwashed slack per month, has been awarded to the **Berry-Bergs Coal Co.,** while the boiler requirements of the company, amounting to approximately 200 tons of No. 4 washed pea and No. 3 washed nut per month, was awarded to **Donk Bros. Coal and Coke Co.** Address Gen. Mgr. C. P. Burgess, St. Louis Screw Co., St. Louis, Mo.

Denver, Colo.—The Denver Gas and Electric Co. have a contract with the **Cedar Hill Coal and Coke Co.** for furnishing the fuel requirements at their gas plant, involving approximately 250 tons per day, which runs for three years. The contract for supplying the power plant with approximately 200 tons per day expires in about a year and a half, and is held by the **Rocky Mountain Fuel Co.** Address Vice-Pres. and Gen. Mgr. W. J. Barker, Denver Gas and Electric Light Co., Gas and Electric Bldg., Denver, Colo.

COAL AGE

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The Christmas Message

Peace on earth, good will toward men

WHERE? An American schoolboy can answer that. Here in America, but not on the other side of the ocean.

Just around the corner from our office is a politician orating on the subject of preparedness. (Everybody is doing it or will be doing it before Congress adjourns in the Spring.) And what is he saying? Well, among other things he is saying that our mine workers and our mine owners must be made to pull together before it is too late if we would profit by the mistakes of our brothers across the water.

Some day we may have to mobilize our mines and our mills as well as our army, and then we shall have to appeal to the patriotism of all. The English have found that such patriotism cannot always be taken as a matter of course. Since the orator is only a politician, he can't be expected to express himself too clearly, but somehow we don't have trouble to understand such words as mobilize and preparedness, which he repeats again and again. It seems as if they had always had a place in our everyday vocabulary, peace loving though we are.

It's all very well to deplore the fact that civilization seems to have gone to pieces on the other side of the ocean, but while we are doing that, prudence suggests that we do not close our eyes to everything that is going on around us. It hasn't been so long since we considered Europe as on a permanent peace footing.

Peace on earth, good will toward men

HERE is a labor organization whose leaders are crying, "Down with the state militia—we will have nothing to do with it." Where are they going to lead us?

Here is an operator who is demanding that he be left to follow the dictates of his own conscience in dealing with his men. His forefathers dealt with the Indians, guided by their conscience only.

And here is a lawmaker who proposes a law to make it illegal for corporations to employ guards for their properties in times of mob reign, nor does he realize that he is taking sides in a conflict. Again, here is a community clamoring for pardons to be given a veritable army of murderers because punishment or confinement will not cure crime.

How easy it is to get in tune with the spirit of strife.

Perhaps after all we too may profit by the Christmas message, and in spite of all our presumptions to the contrary would present but a sorry spectacle should we attempt to sit in judgment upon the civilization across the seas.

Peace on earth, good will toward men

No, we have not outgrown the need of such a Christmas message, we men of the mines.

Ideas and Suggestions

Cashing In One's Experience

How many of you mining men make it a rule to profit only by your own experience in the mining game?

Several years ago most of you would have answered like the man at the altar about to be married. We had not then progressed to the point where the other fellow's experiences are almost as freely at our disposal as our own. We were not as used then as we are now to trade journals containing the cream of interchangeable ideas and experiences.

But with all the means at our disposal, how many of us continue to cash in only our own experiences and how few are willing to accept gratis a few shares of the other fellow's stock, which would enable us to draw dividends from his investment?

Experience is often another definition for mistakes. The man who is a failure is the one who has blundered and is not able to cash his experience. The trouble in the coal-mining business is that it takes too many mistakes to produce an adequate supply of experience, and after all there is no reason why a man's supply need be acquired in this way.

Coal Age is constantly trying to present interestingly facts and experiences of the mining game which will benefit its readers. Every good suggestion on the Foreword page or elsewhere is born of some experience. Some blunder was made and the forfeit paid; then came the remedial idea, and the result of its application is given to the workers all along the line.

Eliminating Idle Hands

Do you want to run your plant with only as many men as are necessary for its safe operation? Of course you do, and you believe you are until careful scrutiny shows up a man who could be dispensed with. You don't want it to happen again, do you? Of course not. Then look through your trade-journal files. You'll be almost sure to find a good scheme of daily quota sheets which will help you to avoid it in future.

You don't want straw men on your roll? You hardly see how they could get there, do you? But you read about it every now and then in companies whose payroll plan is about like your own. Many suggestions and definite plans have been noted regarding this. Better look back through your files and avail yourself of systems employed by concerns that have encountered this same trouble. It may save you the cashing in of a very expensive experience.

Do you want to know how to keep an adequate stock of mine supplies without tying up too much money? You'll find many a good suggestion you can utilize to help accomplish this, such as the right kind of stock sheets, classification, etc.

Do you want "safety first," and do you want to work out policies of welfare and all that kind of thing for the benefit of your employees? You can have it in large measure simply by reading what the other fellow has found best. You can work your policies out the same way at no extra cost for his experience.

I know a man whose plan of making subscriptions for trade journals pay is to take each issue and index the best suggestions of any kind. He puts them in effect and makes a record of the result in actual money saving. At the end of the year the price of the subscription has been returned manyfold.

Don't permit yourself to believe that you can't realize on the other fellow's experience. All you've got to do is to get busy and do it.

❖

Just Plain Horse Sense

Nearly everybody has some idea that horsepower is a standard for estimating the power of steam engines.

Horse sense may be defined as a standard for measuring the power of men's minds as applied to practical things. It is a quality of mind for which executives are always looking, and for which they are willing to pay a good price.

Recently when visiting another man's plant (a big one too) I ran across a horse-sense man.

His company had successfully weathered two dull years. A look through the supply house showed what seemed to be an abnormally low stock for an operation of that size. My first thought was that the recent hard times were responsible for the small quantity of supplies, but a remark concerning this matter struck home, and the "milk in the cocoanut" was revealed.

"No, sir," the official in question replied, "we don't let our people order stuff we can get along without. We don't countenance waste, and we can't afford to tie up cash in surplus stores."

Then he told me a little story. Taken out of his mouth and told in my own way, it ran like this:

"Passing through our machine shop one day I saw a barrel full of waste material. My master mechanic said it was old junk, packing, etc., that was no good. I said nothing then, but that night I went down and emptied the barrel. It was nearly full of packing, which I carried to the storeroom. Taking the packing of similar sizes out of new boxes in stock, I substituted the old and hid the new. Later my master mechanic used it all without a word, and I never told him what I had done until the right time. Now he knows how to use packing."

It was a clean-cut case of plain horse sense, and in my mind I had to hand it to the superintendent (for it was he) who showed me around.

I thought of supply houses I had seen at other mines where stock was carried far in excess of requirements and especially of one place where the surplus packing spoiled through deterioration and was utterly lost.

There is a moral: Plain horse sense practically applied always pays.

Have you a horse-sense man? Pay him well and keep him with you. If you haven't such a man, look about and find one soon.

A Man's Courage

By William Jardine*

Courage in man is a subtle quality, and its expressions are as varied as human nature itself. To the mining man it is a necessity, and its possession frequently means success.

There is the silent, intelligent courage of the "plodder" and the bold, reckless courage of the "hustler."

A man without this quality, if employed at the head of an operating concern, is miserably lost.

He ceases to be a "live wire." Have you noticed the other fellow get promotion and wondered why he got it? Did you go out and congratulate him, or did you stay back and say to yourself, "It is I that should have been promoted?"

Are you responsible for your position as a worker? Have you the necessary Twentieth Century push? Examine yourself and determine how to act. *Act today.* We desire to better our position, and the number of attempts to accomplish those desires bear adequate testimony to unflinching courage.

Work in earnest, combine dignity and interest with your work, and you will "get there." Above all, "have the courage of your convictions."

⁂

Taking a Chance

By George N. Lantz†

The mine where I am employed has been running on short time, and on idle days only a few men are on the job—the mine-boss, the engineer, the blacksmith, the pumper, the stable-boss and myself.

Yesterday the engineer, as he frequently does, asked me to go to the hoppers for boiler coal. I took the motor and backed the empty trip to the hoppers. I backed into the loaded cars on the hoppers very carefully, but they started to move slowly, and before I could get to them from the motor, the end of the trip had run through the hopper wall. Result—two broken cars, two twisted rails, repairs on the return switch and a loaded car off the track, while the coal from the two wrecked cars had to be hauled by wagons and loaded on mine cars.

The accident might have been prevented in any one of these three ways: I could have taken someone along to couple the loads to the empty trip, but the blacksmith was busy, the engineer could not leave his engine and both the mine-boss and stable-boss were out of sight. I could have switched the empty trip and taken a light motor. I could have stopped the trip before I reached the loaded cars until I had assured myself that enough brakes were set to hold the trip. Instead of doing this, however, I "took a chance."

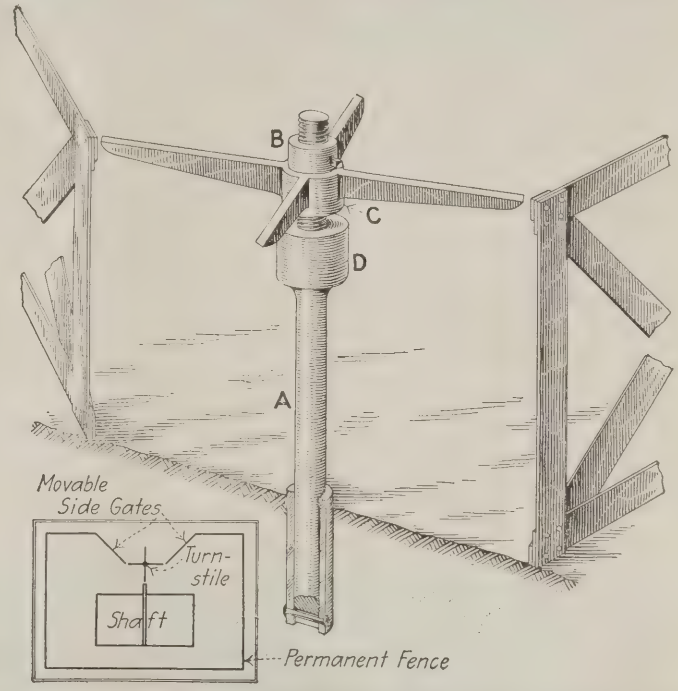
I relate this incident because it is a rather impressive lesson in the need of "safety first" at all times and not spasmodically. I have consistently advocated "safety first," and as a rule I practice what I preach. And this one violation of a self-imposed rule of conduct will not prevent me from continuing to preach and to practice the "safety first" rule.

The "safety first" movement is gaining ground. The cautious man is coming in for the same sort of admiring approval that the reckless man claimed a few years ago. We frequently hear the question, "Which way is the safest?" when miners are undecided on a plan to take in doing their work, and often the easiest or the quickest way is discarded in favor of the safest way. The old rule of "take a chance" is being supplanted by "safety first."

⁂

A Simple Shaft Gate

The shaft gate illustrated herewith is used at the colliery of Jermyn & Co., at Rendham, Penn. Its purpose is to limit the number of men who can get on the cage at one time. The post *A*, which may be a piece of old shafting, is slotted at the bottom and threaded at the top. The four-armed turnstile *C* screws up and down on this post. Its motion is limited by the collar *B*, which can be fixed in any position by the setscrews.



DETAILS OF A SAFE AND PRACTICAL SHAFT GATE

As used at Rendham, the stile makes 2½ turns, this allowing 10 men to pass to one side of the shaft. When this number has passed, the stile is turned in the other direction by the men passing into the other cage.

When the shaft is being used for coal or supplies, the gate is lifted out of the socket and set aside. The side gates are light enough to be easily handled by one man. These are lifted out of the way when not in use. This arrangement, devised by Superintendent Corcoran, prevents men from crowding onto the cages in larger numbers than would be safe or allowable by law.

⁂

How many thousands of coal-mine employees are at their jobs just to see "how much they can get out of it" rather than to determine "how much they can put into their work"!

⁂

There are many people who do not sympathize with the cry of "over-production." They attribute the "high cost of living" to under-production per human unit and contend that under-production is the direct cause of under-consumption through lack of capacity to purchase.

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*No. 4 mine, Bunsen Coal Co., Universal, Ind.

†New Straitsville, Ohio.

Compressed Air in Construction and Repair Work

By Charles C. Phelps*

SYNOPSIS—For certain kinds of work compressed air is preëminently adapted. It is also often desirable to take the tools to the work rather than to bring the work to the shop. In such instances the portable motor-driven air compressor may be used to advantage.

In connection with construction and repair work both above and under ground there are many operations that can be performed much more economically and expeditiously with the assistance of compressed air than by any other known means. In many instances it might not be advisable to construct a stationary compressor plant or to pipe air from an existing plant located at a distance, owing to the temporary character of the work.

The average uptodate coal-mining property is equipped with an electric transmission system, and under these circumstances, one of the most convenient means of obtaining compressed air for use in construction and repair work is by employing electric motor-driven portable compressors. Truly successful apparatus of this type is of comparatively recent development, and it is the intention to discuss in this article only the various types of electrically driven outfits and their uses. It should be borne in mind, however, that corresponding machines driven by other prime movers, such as gasoline, oil or steam engines, are sometimes better adapted to existing conditions and, as a matter of fact, are in extensive employment.

Construction that must be prosecuted at one time or another outside of the coal mine usually involves rock cuts and the removal of boulders in connection with grading for tracks or roads, digging trenches and pits, removing old concrete and masonry construction and the like. For these purposes Jackhamers, operated by compressed air, are highly economical, drilling from 100 to 200 ft. of hole per shift, whereas one-tenth of this footage could not be obtained in all probability in the same time by hand.

In building concrete foundations, culverts, bridges, dams, sluices, buildings, etc., pneumatic concrete rammers are often used to advantage. A Belgian engineer who made a study of this subject found that the number of blows struck played a far more important part in compacting the concrete than the force of the blow. It follows that the pneumatic rammer, which strikes approximately 600 light blows per minute, is ideal in comparison with hand ramming in which the maximum speed obtained is 50 or 60 blows per minute. This conclusion is verified by a test made with small cubes in which 60 blows left the concrete with a resistance of 2,844½ lb. per sq.in., 40 blows with 2,460¾ lb. and 20 blows with 1,538 lb. A similar test with hand ramming gave a resistance of only 939 lb. per sq.in. The hand rammer used weighed 33 lb. and was permitted to fall from a height of 20 in.

It is apparent that by obtaining a stronger product by tamping, a lighter structure will often serve the purpose, saving considerably in cost of materials and workmanship. Pneumatic tampers of a different type are being adopted extensively for tamping railroad ballast.

In the construction of steel or wooden bridges or trestles, laying tracks and erecting steel or wooden structures of various kinds, pneumatic tools are invaluable. Pneumatic drills, are used for drilling metal, boring wood, reaming, tapping, operating jacks, cranes, hoists and grinding wheels and small circular saws. They are also of great advantage for running in lag screws and tightening nuts. In one case a gang of seven men put up from 80 to 100 hangers in 9 hr., each supported by two ¾-in. lag screws. The holes were bored with pneumatic augers using ⅝-in. bits, later driving the screws home by means of the same motors used with extension sockets. This is at least double the work that could be performed under similar conditions by using augers and wrenches operated by hand.

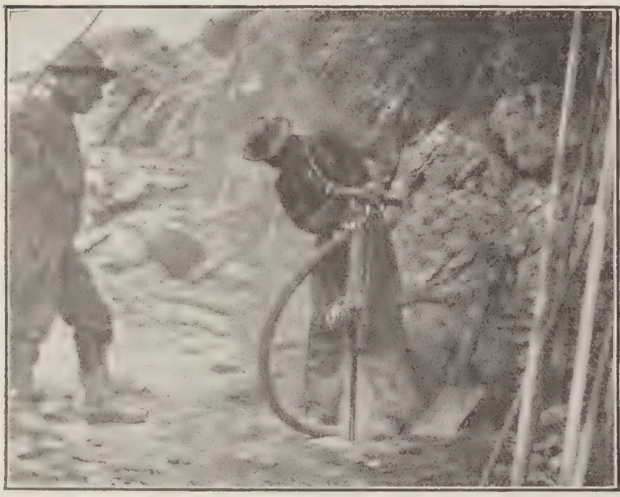

FIG. 1. MAKING A ROCK CUT WITH JACKHAMERS

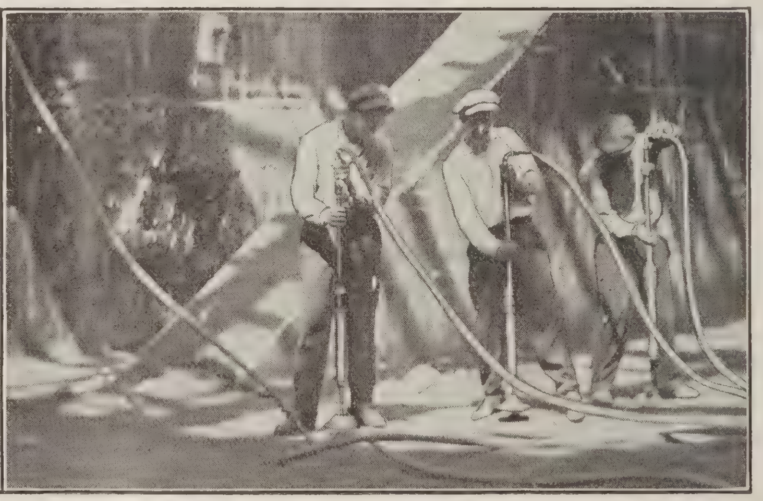

FIG. 2. PNEUMATIC CONCRETE RAMMERS IN OPERATION

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*New York City.

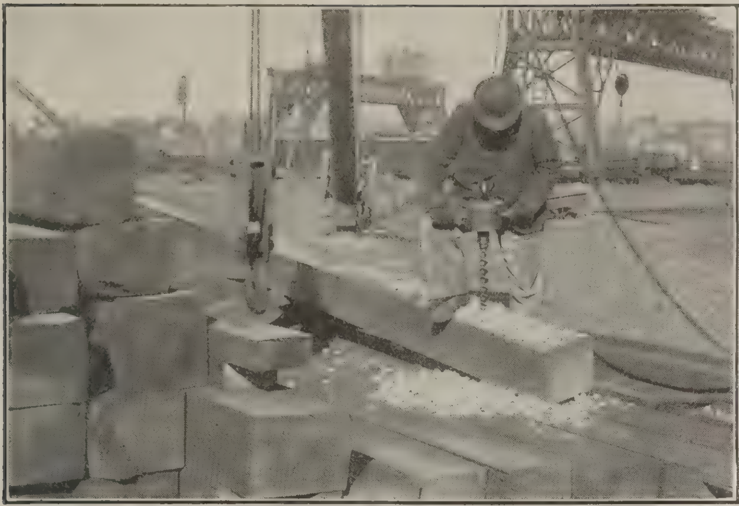

FIG. 3. A PNEUMATIC AUGER IN OPERATION

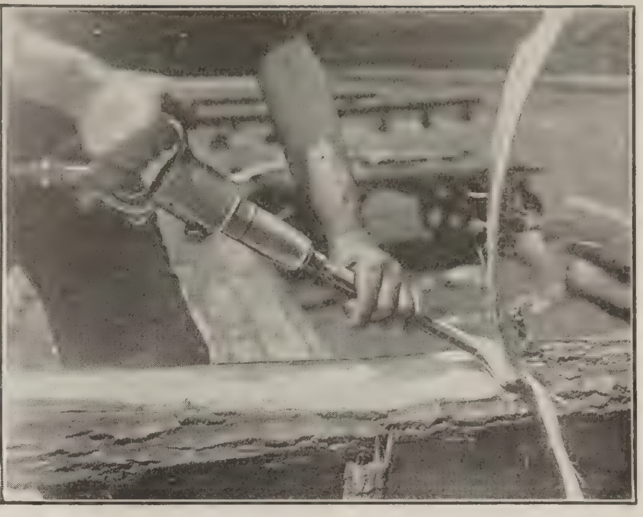

FIG. 4. CHIPPING HAMMER USED FOR TIE PEELING

There is no comparison to be made between pneumatic riveting hammers and hand methods for heading rivets. Compressed air is also convenient for blowing rivet-heating forges. Riveters can be fitted with a handy rivet "busting" attachment and have been adapted to driving spikes. In one case they were used for driving 9-in. spikes at the remarkable rate of 5 sec. each. On the same job a number of ⅞-in. bolts 38 in. long were each driven by compressed air in 1 min. as against 18 min. by hand.

Pneumatic chipping hammers are invaluable for trimming, cutting and calking metal and may be fitted with a special chisel for such work as peeling the bark from logs in preparing ties or props. This last is a new application of this tool which is capable of great savings. It is said that the most expert tie peeler is capable of peeling by hand an average of 100 ties per day of 10 hr., but the average output is nearer 50 ties per day. Experiments have shown that an inexperienced laborer has no difficulty in thoroughly peeling from 150 to 200 ties per day with the tool illustrated in Fig. 4. These tools do not consume much air, but even with this expense added, there is a large saving over the old method.

In connection with repair work the opportunities for using pneumatic appliances are almost without number, for it is in this class of work particularly that it is often desirable to take the tool to the part to be repaired instead of taking the part to the shop. The greatest savings effected with portable pneumatic tools often pertain to the avoidance of costly delays incident to some minor part giving way and affecting the operation of important machinery.

In addition to the applications outlined, pneumatic drills are used for grinding and reseating valves, for reboring cylinders and for operating large valves and small machines. Chipping hammers are used for quickly cutting out sections of pipes and sheet-metal work and for scaling rust and paint from metal surfaces. The cement gun, the sand-blast machine, pneumatic paint and whitewash spraying machines, pneumatic displacement pumps and air-operated reciprocating pumps are other devices of the greatest value in repair and construction work.

Many of the appliances mentioned also find everyday application about the shop and power plant. A few of these applications may be enumerated as follows: Setting locomotive valves; expanding boiler tubes and flues; cleaning scale from boiler tubes with the aid of pneumatic drill motors; beading tubes and calking sheet metal with chipping hammers; drilling anchor-bolt holes in concrete machinery foundations; blowing out the air spaces of electric motors, the flues of boilers and other inaccessible places by means of an air jet. Compressed air is also commonly used for testing the tightness of pipe lines. Air from a stationary compressor is not available in some of the smaller plants, and in such cases a portable unit might be used to advantage.

Having defined the field of the portable compressor in general, the various types will now be described briefly.

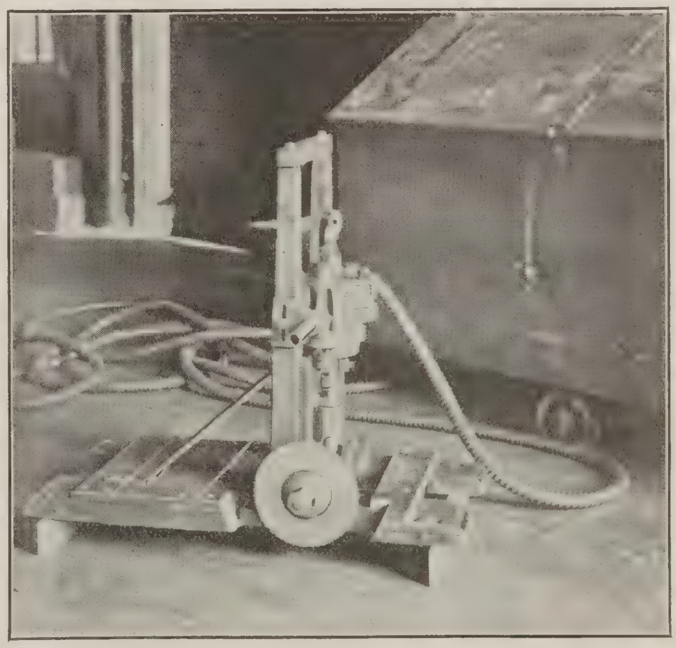

FIG. 5. PORTABLE SAW FOR CUTTING OUT OLD ROOFING OR FLOORING

The mine car compressor is the most suitable type for underground operations. During the past few months it has been adopted extensively for operating hand drills, mounted cutting machines, punchers, pneumatic tools, etc. After a brief try-out that demonstrated beyond doubt their economy, one Pennsylvania coal mine purchased 14 of these outfits, and many other mines in various parts of the country are starting to use them.

This equipment is a self-contained, self-lubricating, electrically operated unit, totally inclosed as a protection against the entry of dirt to the working parts. It can be started up by the miner and will run without further attention while he is drilling the coal or rock, excepting occasional replenishment of water in the reservoir cooling jacket surrounding the compressor cylinder. It may be quickly and easily moved over the regular mine tracks to any part of a mine and can be set up and connected with the regular mine power wires in a short space of time. This type of compressor is made in capacities ranging from 78 to 415 cu.ft. of free air per minute.

The mine car compressor is equally suitable for use above ground provided the work is situated within a few hundred feet of the tracks over which it runs. Fig. 6 illustrates a type that is perhaps better suited for general conditions above ground, as it can be transported by horse or other power to almost any location. The entire outfit is mounted on a covered truck. It is built in various capacities ranging up to 464 cu.ft. of free air per minute.

The cost for power of such an equipment is less than would be expected. Consider the case of a motor-driven compressor of 145 cu.ft. displacement. This would require a motor with a horsepower input of about 25 for 70 lb. air pressure. Three cents per electrical horsepower per hour is undoubtedly a liberal allowance for power in coal-mining regions. Interest, depreciation and repairs figured at 25 per cent. of the initial investment of such an equipment would amount to about $200 per year—a liberal estimate. Based on 300 working days per year, one shift per day, this figure would reduce to about 67c. per shift.

Supposing the work under consideration is the digging of a wide ditch through rock, employing two hand drills for an 8-hr. shift, the cost would figure about as follows per shift:

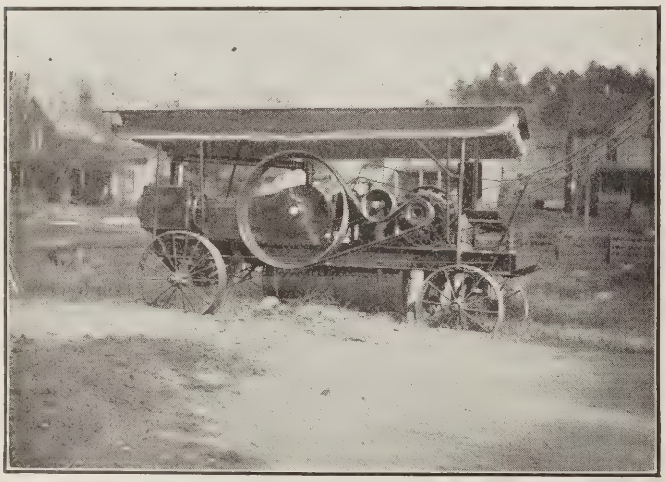

FIG. 6. PORTABLE ELECTRICALLY DRIVEN COMPRESSOR

Operator	$4.00
Two drill runners at $2.50	5.00
Lubricating oil	.50
Cost of power for air, 25 hp. for 8 hr. at 3c. per hp.	6.00
Interest, depreciation and repairs	.67
Total per 8-hr. shift	$16.17

No reduction is made in power charge for unloaded periods, which would undoubtedly reduce this charge considerably.

The footage accomplished with a Jackhamer drill is usually between 100 and 200 ft. of hole per day, depending upon conditions. We shall assume 150 ft. as an average accomplishment. The two machines would therefore drill 300 ft. per day. Thus the cost per foot of hole drilled would amount to $0.0539.

Under similar conditions the two drillers could put in by hand not over 20 or 30 ft. of hole per shift employing the "single-jack" method. Assuming the same rate of wages and an average accomplishment by hand of 25 ft. per 8-hr. shift, the labor cost would be $5 for the two men, and the cost per foot of hole 20c.; in other words, machine drilling with the portable compressor, including all charges, would result in a saving of $0.1461 per ft.; that is, a saving of about 75 per cent. The cost of sharpening steel has not been included in the foregoing estimate as it would be about the same per foot in each case.

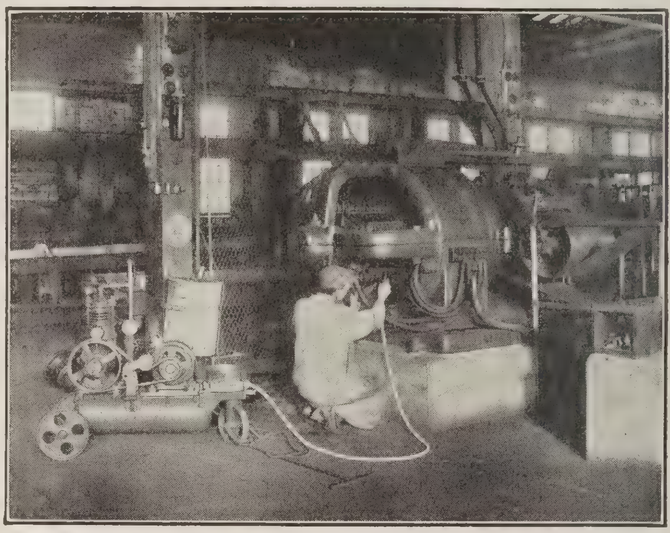

FIG. 7. CONVENIENT TYPE OF PORTABLE SHOP COMPRESSOR

If space permitted, similar comparisons could be worked out for other operations, showing the remarkable savings effected by employing compressed air supplied by a portable plant.

Fig. 7 shows a convenient type of portable compressor for use in shops, power plants and other places where a small amount of compressed air is required. The compressor proper is an air-cooled Imperial type XII vertical machine having a capacity of 6-cu.ft. displacement. A type of short belt drive similar to that used on larger machines is used to connect motor and compressor. The air receiver forms the body of the truck, and on it are mounted compressor, motor and all accessories, including a 20-ft. coil of air hose, plug and switch, wire, etc.

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The Presence in Mine Gas of Ethane, propane and butane has been held to indicate that such gas did not wholly arise from the coal, but was partly or wholly from gas wells in the vicinity. However, if mine air does not contain these gases their absence does not prove that the atmosphere of the mine is necessarily free of admixture with gas from wells, because it has been found by the United States Bureau of Mines that out of 25 samples of natural gas from cities five were free of such hydrocarbons, among which cities were Texarkana, Ark.; Lewis and Mansfield, La.; Nowata, Okla.; and Corsicana, Tex. Some natural gas has as much as 20 per cent. of ethane, like that supplied to Louisville, Ky. It appears from the investigations of G. A. Burrell and G. G. Oberfell that the gas in one stratum may be free of ethane and that another below it may have as much as 5 per cent.

Mine Telephone Equipment

By Walter C. Freeman

SYNOPSIS—A detailed discussion of various telephone systems, with practical suggestions concerning the selection of a type suitable for coal-mine service. Metallic circuits are recommended in preference to ground-return circuits. Remarks concerning supporting and insulating the wires.

The many advantages and economies accruing from the installation of telephone systems in mines have been reviewed in the columns of mining periodicals at various times, but little space has been devoted to the discussion of equipment and its arrangement to give the most efficient operation. It is the purpose of this article to describe the operating features of the systems and apparatus most commonly used, also to offer some pertinent suggestions of practical value regarding installation of the equipment.

Telephone systems in general are classified into two main groups; namely, the "common battery" system and the "local battery" system. Each has its particular advantages for the class of service for which it was designed, though the speech-transmitting efficiencies under the same operating conditions are nearly equal in value. The main point of difference between the two systems is the method of supplying electrical energy to the telephone instruments.

In common battery operation, as the name implies, the current for all of the telephones in the system is supplied by one main battery, usually of the storage type, at a potential of approximately 20 volts. This battery not only furnishes the current for talking purposes, but for the operation of the various switchboard signaling devices as well.

It will be readily understood that this method of power supply is objectionable for mining service because any interruption of the current would totally disable the system. In addition to this serious drawback, the common battery system does not provide a means of signaling between any two telephones without the interposition of a switchboard and the assistance of the switchboard operator in establishing a connection. Furthermore this system when installed to meet the service requirements of mines of average size does not compare favorably with the local-battery system in the factors of first cost, maintenance and operating expense. For these reasons the common battery is seldom recommended or used for service underground and will be eliminated from further discussion herein.

The Local-Battery System

The telephones used with the local-battery system are equipped and wired to consume current for talking purposes, furnished by either two or three cells of dry battery which are placed within the housing of each telephone set. The alternating current which is required for ringing other telephones on the same line and also for signaling the switchboard in large systems is generated by a hand generator, which likewise is included in the equipment of each instrument. Under this arrangement it will be noted that each telephone is independent of an outside source of power, and consequently may be used either for systems comprising but two telephones or for larger systems with many instruments connected.

The local-battery system, when the electrical properties of the various pieces of apparatus in the telephones are properly proportioned, is quite flexible. Any number of telephones up to 15 may be connected in multiple to one pair of wires so that each telephone station may call and talk with any other on the same circuit without the aid of a switchboard and operator's service. The signaling between the various stations is accomplished by means of a system of code rings which are sounded upon all telephones simultaneously; therefore the number of telephones per line should be limited to about 15 so that the ringing code will not become unduly complex and difficult to transmit correctly. It is possible to operate as many as 40 instruments on a line, but the continual ringing of the bells and the complex code of signals would be distracting.

In mines where a greater number of telephones are required, the telephones are separated into groups of convenient number served by one line. The several lines are brought to the surface and centralized upon a switchboard so that a connection may be established between any two telephones in different groups. This connection to the switchboard does not affect the ability of any station to independently call and converse directly with any other telephones connected to the same line. An injury to a telephone or an open circuit in any section of the line wire will not in the majority of cases interfere with the operation of the rest of the system as a separate unit. The local-battery system is simple to install and maintain and in addition is generally less expensive in first cost and annual charges than the common-battery system.

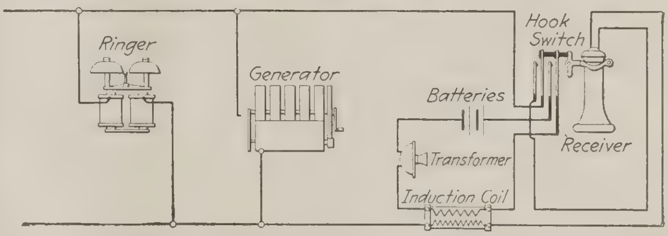

FIG. 1. ESSENTIAL PARTS OF A MINE TELEPHONE AND CIRCUIT CONNECTIONS

The three principal elements of a mine-telephone system are the telephone sets, the line construction and the switchboard. The electrical properties of telephones intended for mining service are largely the same as for local-battery telephones used in the smaller towns and villages, but the mechanical construction of mine telephones is quite different owing to the severe hazards to which telephones are exposed underground.

Mine Telephones Should be of Rugged Construction

In mining service the instruments are frequently exposed to mechanical injuries such as falls of rock and ore, rough handling by careless workmen, concussion of blasting and other conditions that will suggest themselves to the reader. Besides these hazards there are many localities in which the telephones are subject to excessive moisture and the corrosive action of acid mine waters and gases. These conditions have been taken into consideration by telephone manufacturers who have developed and now sell telephones designed especially for service in mines.

In order to thoroughly understand how the instruments operate let us consider Fig. 1, which diagrammatically shows the essential parts of a mine telephone and the circuit connections. This circuit arrangement is known to telephone men as a "bridging" telephone circuit because of the position of the polarized ringer and the hand generator, which are connected in multiple to or bridged across the line wires. In this circuit the ringer operates whenever the alternating ringing current traverses the line. The hand generator is equipped with an automatic circuit closer so that it is connected in the circuit only when the crank is turned while calling another telephone station. The object of this switch is to remove the low resistance path through the generator armature which would seriously impair the ringing and talking qualities of the circuit. The permanent connection of the ringers is necessary for the reception of the signals and does not reduce the talking efficiency to any appreciable extent, because the coils have a total resistance of 1,000 ohms or over and a high choking effect toward the passage of the voice currents via the ringers.

The talking circuit includes the transmitter, induction coil, receiver and the hook switch. The latter piece of apparatus is operated by taking the receiver from between the jaws of the hook. In some telephones the hook switch is controlled by the weight of the receiver and is operated by the upward thrust of a spring when the receiver is lifted from the hook. The hook switch in its operated position closes two pairs of contacts. One pair closes the circuit from one line terminal through the receiver and secondary winding of the induction coil back to the other line terminal. The other pair of contacts controls the battery supply and closes a circuit including the transmitter, the primary winding of the induction coil and the battery.

How the Voice Is Transmitted

When the user speaks into the transmitter, the sound waves impinge upon the transmitter diaphragm and impart to it a vibratory motion. The vibrations are carried by means of a small piston to a polished carbon electrode, which is separated from another like electrode by small carbon fragments of uniform size. The electrical resistance between the two electrodes, which are connected to the transmitter terminals, is variable and depends upon the area of contact between the various fragements of carbon and the electrodes. Under the varying degrees of pressure on the piston the resistance of the transmitter is raised or lowered and passes a current of ever-changing value which corresponds in amplitude to the sound waves of the speaker's voice. The undulating current flows in the primary winding of the induction coil, which in reality is a small step-up transformer. It not only steps up the voltage, but also allows the transmitter to operate in a local circuit where it is not affected by the resistance of the line circuit.

When the incoming voice currents are impressed upon the receiving telephone they do not pass through the ringer coils because of their high impedance or choking effect of the windings, but continue on through the secondary winding of the induction coil and the receiver. The receiver contains a U-shaped permanent magnet whose pole extremities are each surrounded by small electromagnet coils which are connected in series. A thin soft iron diaphragm is clamped at right angles to the pole faces of the magnet so as to lie within its magnetic field. The voice currents are alternating in character, and part of each wave augments the field of the permanent magnet through the action of the electromagnet coils and increases the pull on the diaphragm, causing it to further approach the poles of the magnet. Conversely the other and opposite portion of the wave diminishes the tractive effect of the magnet because the current opposes and counteracts a part of the permanent field and allows the diaphragm to recede. The rapid recurrence of this action results in a vibrating movement of the diaphragm which gives motion to the surrounding air and reproduces the sounds spoken into the transmitter at the distance station.

When the receiver is replaced upon the hook, the battery circuit is opened so that no energy will be consumed while the telephone is not in use. The receiver circuit is also opened in order to remove the low resistance path in multiple to the ringers which would seriously impair the operation of the latter apparatus. Some telephones are wired for and equipped with a condenser in the receiver circuit. The electrical properties of this kind of condenser are such that it forms a practical bar to the passage of the alternating current of low frequency used for ringing, but offers little resistance to the high-frequency voice current. This is a valuable device in that it eliminates the ringing trouble frequently experienced on local-battery telephone lines, owing to the failure of the last user to hang up the receiver at the end of a conversation.

Specifying a Telephone Equipment

In ordering equipment for a mine telephone system it is well to specify that the instruments be equipped with ringers wound tc a resistance of about 1,600 ohms. This resistance value is low enough to insure ample current flow in the ringer coils and a clear loud signal, yet high enough to allow the installation of 15 or 20 telephones on one line without unduly overloading the hand generators. The resistance of the ringers in the various telephones connected on the same line should all be equal, otherwise the telephones equipped with low-resistance ringers will consume the greater share of the ringing current and cause the ringers wound higher to ring weakly, if at all.

The local operating conditions and service requirements in mines are so varied that it is impracticable to attempt to recommend any standard practice covering the number and locations of the telephones. In some states laws have been passed to govern the minimum number of instruments to be employed and the places where they must be used. In laying out a system it would be well to consult the state mining laws to see that these regulations are observed and provision made for as many additional stations as good service and economy demand. It is the usual practice to install one telephone within convenient distance of each group of miners so that reports and orders may be quickly and easily transmitted.

Fig. 2 shows a portion of the plan of a mine and the locations of the instruments. In this diagram the squares represent the telephones and the circles the loud-ringing extension bells connected by temporary wiring to each telephone. The telephones are located in the main passageways so as to take advantage of favorable air currents for carrying the sound of the gongs in the proper direction as far as possible. The extension bells are used to avoid the necessity of moving the telephones as the work advances and so that the signals will be heard clearly above the noise of running machinery.

Although local-battery mine telephones will operate on a circuit consisting of one wire and the earth for the so-called return, it is the best practice to employ a full metallic circuit consisting of two wires connecting all instruments. Ground-return circuits are objectionable in that they are extremely liable to become noisy owing to foreign currents, especially in mines where electricity is used for haulage and the operation of drills and cutters. Furthermore the ground connection is in many cases difficult to perfect and there is liability of "cross-talk" or interference between simultaneous conversations on separate lines of this kind.

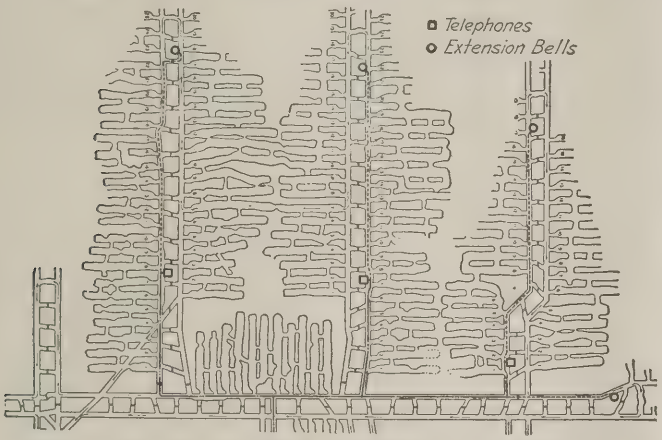

FIG. 2. PLAN OF MINE, SHOWING LOCATION OF INSTRUMENTS

The Most Satisfactory Type of Circuit

The metallic circuit is more expensive to install owing to the additional amounts of material and labor, but this difference is offset by the gain in reliability and efficiency. The kind of line wire to be used is a matter of choice, depending upon the local conditions. Iron, copper and copper-clad steel are the conductors generally used, and in all cases these wires should have a heavy insulation and a substantial weatherproof exterior braid. No. 12 B.w.g. iron wire insulated in the manner described is entirely satisfactory for mine systems as to electrical properties and mechanical strength, but should be used only in dry mines. In localities where there is much seepage, especially of waters having an acid reaction, lead-covered and rubber-insulated twin copper wire should be employed. Insulated copper-clad steel wire of the No. 14 B. & S. gage has been used to some extent in place of iron wire with good results. This wire has the tensile strength of steel and a conductivity about 40 per cent. of that of pure copper wire of the same diameter.

The wires should be supported much in the same manner as electric light and signal wires, on either porcelain knobs or glass insulators fastened to the roof timbering. The same precautions for insulating electric light circuits should also be observed in the construction of telephone lines. The clearance between the telephone lines and such circuits should be kept at the maximum distance to avoid accidental contact and to reduce the electromagnetic induction between the two systems. In some places where lighting and power circuits parallel the telephone lines for a considerable distance, the foreign currents caused by induction make the telephone lines so noisy that conversation is nearly impossible. To diminish this interference it is necessary to use either twisted-pair telephone wires on such parallel runs or to transpose the two wires of the telephone circuit at frequent intervals. Either method exposes each wire of the pair equally to the disturbing influence and balances the circuit so that the induced currents in each tend to neutralize. Under this condition there is no flow of induced current; therefore no extraneous noise is heard in the telephones.

All splices should be made with wire connectors or else well soldered without the aid of acid soldering pastes or compounds. Bad splices are intermittent sources of trouble and are extremely hard to locate. Where wires pass under or over pipes or through holes liable to abrade the insulation they should be covered with "circular loom," "flexduct" or porcelain tubes.

As before stated it is necessary to use a switchboard for connecting the various lines when the number of telephones installed does not permit the connection of all instruments to one circuit.

One switchboard scheme used by a West Virginia mining company appealed to me as an ideal equipment for a small system. The company in question used a small switchboard and had it equipped with a small double-pole double-throw switch in connection with each of the ten line equipments installed therein. The purpose of these switches was to disconnect the lines from the switchboard and to connect them to a pair of bus wires at night so that any telephone might call any other without the necessity of keeping the operator on duty when the volume of traffic was light. As each line carried but three telephones, each station could easily signal any one of the remaining 29 stations. This instance is cited to show that, with a little study, telephone systems can be worked out so as to give maximum convenience and economy.

Coal Fields of Indiana

By Frank I. Pearce*

The productive coal area of Indiana is located in the southwestern part of the state and constitutes the eastern edge of what is known as the eastern interior coal region. The area occupied by "coal measures" embraces about 6,500 sq.mi. To say, however, that the coal fields of Indiana cover so large a territory does not mean that coal beds of a minable character are to be found everywhere under this area.

There are large portions within the general field where, although the rocks are of carboniferous age, no local seams whatever are to be found. There are other areas of large size which contain coal, but are lacking in workable seams. To say, therefore, that Indiana has or did have 6500 sq.mi. of coal lands is an entirely erroneous statement. There are within the state of Indiana 15 or more seams of coal varying in thickness from a black mark to strata which in some places are 10 ft. thick.

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The Lateral, or Side, Friction of Hoisting Ropes

SYNOPSIS—Formulas connecting the length of the hoist, the distance from sheave to hoist drum, the ratio of rope diameter to that of the drum, and the angle made by the rope in its central and extreme positions are proposed.

The side, or lateral, friction of winding ropes was the subject of a paper presented by H. W. G. Holbaum at a meeting a few months ago of the North of England Institute of Mining and Mechanical Engineers. He said therein that practical men are inquiring for a simple formula connecting the various factors which determine the amount of lateral friction encountered by a winding or hoisting rope as it travels from one side of the drum to the other.

His object was to submit such a formula and to initiate a discussion leading possibly to the solution of the problem. It had been solved by the Koepe system, but a satisfactory solution for the case of the ordinary wide drum has yet to be found.

An Equation for Side Wear

Let A equal the angle of maximum friction in degrees. When a rope between the pulley and the drum lies in the same vertical plane as that of the pulley, there is no lateral friction. In practice the angle of maximum friction will probably be found to be not less than 1 deg. and not more than 3 deg. The purely numerical value of A therefore ranges from 1 to 3. Then the ropes being central on the drum at meetings of the cages.

$$A = \frac{10\,H}{R\,L} \qquad (1)$$

Where

H = Length of cage travel from receiving to discharge position;

L = Length of the rope extending from the sheave to the drum;

R = Ratio of the drum diameter to the normal diameter of the rope.

This ratio is from 110 to 150 in English practice. H and L may be taken in any units, but both must be in similar units. If it be deemed expedient that A shall not exceed a given predetermined numerical value, the winding engine must either be placed at such a distance from the pit that

$$L = \frac{10\,H}{A\,R} \qquad (2)$$

or the drum must be of such a diameter that

$$R = \frac{10\,H}{A\,L} \qquad (3)$$

That is to say, if D = drum diameter and d = rope diameter, both stated in similar units, the following formula must be taken:

$$D = d \times \frac{10\,H}{A\,L} \qquad (4)$$

If the width of drum required for each rope is W, then

$$\left.\begin{array}{l} W = x + \dfrac{7\,H}{20\,R} \\ \text{or} \\ W = x + \dfrac{7\,A\,L}{200} \end{array}\right\} \qquad (5)$$

where x = the additional width required to accommodate the two or three holding coils of rope that remain on the drum when the cage is at the pit bottom. In (5), W, x, and A (or L) must all be taken in the same units (feet, inches, etc.).

Some Quantities Are Fixed

It will be seen by (1) that since H cannot be altered for a given mine, A can be reduced only by increasing L or R or both. There is a practical limit to the permissible value of L, since most managers prefer that the engineman shall have a clear view of the dumping operations of the cages. Probably L may legitimately be extended to be 50 yd., in which case any reasonable value of R will reduce the angle A of maximum friction to about 1½ deg., always provided that the ropes are so adjusted as to center themselves at cage meetings, or midtravel. The lateral friction should be quite a negligible quantity in the case of the shallower mines.

The value of R may be increased in either or both of two ways—the diameter of the drum may be increased or that of the rope may be reduced. Mr. Holbaum believes that as the problem of electric hoisting approaches more closely to its complete solution the present necessary connection of the bigger engine with the bigger drum will disappear, owing to the already proved superiority which electrical systems possess in the matter of elasticity. He summarized as follows:

1. Other things being equal, the lateral, or side, friction will be at a minimum if the rope assumes a position in the center line of the drum at midwind.
2. Other things being equal, the lateral friction varies inversely as the distance L intervening between the sheave and the drum.
3. Other things being equal, the lateral friction varies inversely as the ratio R which the diameter of the drum bears to the diameter of the rope. The magnitude of the ratio R may be augmented, not only by increasing the diameter of the drum, but also by decreasing the diameter of the rope—that is, by using only the best material—so that a smaller diameter of rope may suffice for a given load.
4. Other things being equal, the lateral friction varies as the square of the angle A.
5. Other things being equal, the destructive character of the lateral friction varies with the roughness of the rope; hence, ropes of the flattened-strand and locked-coil types suffer less than ropes of the ordinary type because their surfaces are smoother.
6. It is also obvious that the lateral friction in any given case will be much less if the rope is kept thoroughly lubricated than it can possibly be if this point is even partly neglected.

Snapshots in Coal Mining

CONCRETE TIPPLE AT HAZARD, KY.

STRIPPING NO. 7 SEAM, DANVILLE, ILL.

FAIRFAX MINE, FAIRFAX, WASH.

SULLIVAN POST PUNCHER, LAFAYETTE, COLO.

TWO TIPPLES OF YOUGHIOGHENY & OHIO COAL CO., WASHINGTON COUNTY, PENNSYLVANIA

Importance of the Welsh Coal Fields

The importance of Cardiff and of the South Wales coal field as the sole source of supply of fuel for the British Navy and for most of the French ships has attracted such attention to the district that some particulars about the field may be of interest, says Consul Lorin Lathrop in *Commerce Reports*.

The Welsh coal field has a superficial area of 1,000 square miles. There are 700 mines in operation, and the number of employees above and below ground is nearly 250,000. The product ranges from bituminous to anthracite and includes the Cardiff smokeless steam coal, accepted in Europe as indispensable for naval vessels. The classification of the coals of the field is as follows:

(1) Bituminous—House, gas, coking, and manufacturing coals.

(2) Steam and anthracite—Coal for steam raising, malting, lime burning, gas power, hop drying, etc.

(3) Semibituminous, or second-class steam—Coal applicable for stationary engines and bunkering of steam vessels.

(4) First-class steam—Coal in seams from which Admiralty is supplied, and coals of similar quality.

COAL AT A DEPTH OF MORE THAN ONE MILE

The quantity unworked in best steam coal seams 1 ft. thick and upward in the collieries on the Admiralty list is estimated to be in excess of 3,000,000,000 tons, of which two-thirds is in seams of 2 ft. and over. The field is expected to yield in the future over 8,000,000,000 tons of bituminous, 6,000,000,000 tons of anthracite and nearly as much of the semibituminous, or second-class steam coal, and 4,000,000,000 tons of free-burning steam coal in the western division. The greatest estimated depth at which the coal lies is 6,050 ft. The coal is stated to be the most costly in the world to raise. Owing to the geological and labor conditions the output per man employed is the lowest in any great field of the world, being about 230 tons per annum. The mining valleys are intersected with a network of railways that connect with the trunk lines of England, and also with the ports on the south from Newport, Monmouthshire, on the east, to Llanelly on the west.

Cardiff is the main outlet for the field and is the leading coal-shipping port of the world. The annual shipments exceed 25,000,000 tons, and always represent approximately half the production of the district. The yield for 1914 is considered to have exceeded 52,000,000 tons, a record year with the exception of 1913, when the output exceeded 56,000,000 tons. Of the total output, 10,000,000 to 12,000,000 tons is of the quality known as best Admiralty coals. Since the beginning of the war the exportation of this grade has been prohibited.

EXPORTS OF COAL, COKE AND PATENT FUEL

Exports of coal, coke and patent fuel from the United Kingdom for the first seven months of 1914 amounted to 43,000,000 tons, a falling off as compared with the corresponding period of the great boom year of 1913 of 1,257,000 tons. For the five war months shipments were 18,860,000 tons compared with 32,360,000 tons for the last five months of 1913. The total foreign and colonial shipments from the United Kingdom in 1914 were 61,680,000 tons compared with 76,700,000 tons in 1913. The average value per ton f.o.b. was $3.30 in 1914, against $3.40 in 1913. Shipments from the United Kingdom to France were hardly reduced by war conditions; they exceeded 12,000,000 tons in both 1913 and 1914. Exports to Italy were reduced by 1,000,000 tons, and to Spain and Egypt by more than 500,000 tons each. Exports to Brazil fell from 1,900,000 tons in 1913 to 1,200,000 tons in 1914; and to Argentina, from 3,700,000 to 2,900,000 tons.

EXPORTS WERE 16,000,000 TONS

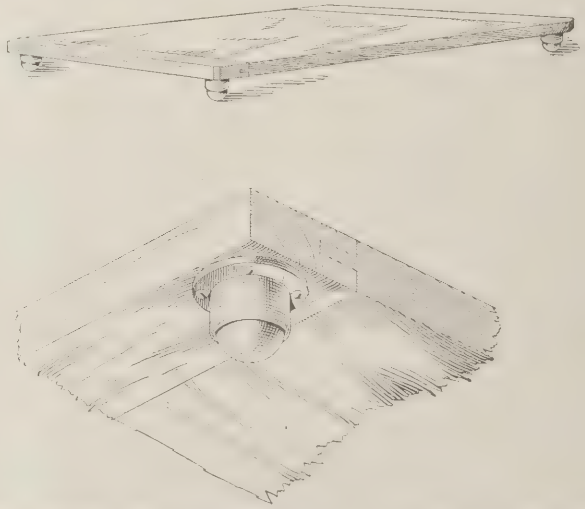
Foreign shipments from Cardiff in 1914 amounted to 16,000,000 tons, as against 19,300,000 tons in 1913. In addition to the 1914 figures given, supplies were sent to the fleet of which no estimate can be given. Coastwise shipments were figured at 2,000,000 tons, a falling off of 800,000 tons; for foreign bunkers, 2,900,000 tons; for coastwise bunkers, 100,000 tons. These figures representing the coal trade of Cardiff for 1914 total 21,000,000 tons; the coal trade of Newport was 5,600,000 tons.

The following table shows the range of prices of coals in 1914 per ton of 2240 lb. f.o.b. Cardiff or Newport:

Kinds	Jan. 1	Highest During Year	Lowest During Year	Dec. 1
Best Admiralties	$4.98	$5.34	$4.37	$5.04
Best seconds	4.68	4.98	4.25	4.74
Seconds	4.56	4.74	4.13	4.56
Best smalls	2.73	3.04	1.76	3.10
Cargo smalls	1.88	2.43	1.39	2.43
Monmouth black veins	4.43	4.56	4.01	4.43
Western valleys	4.25	4.43	3.89	4.31
Best house (at pit)	4.86	4.86	4.80	4.80
No. 2 Rhondda	3.58	3.64	3.10	3.64
Patent fuel	5.10	5.10	4.01	4.31
Foundry coke	6.07	6.07	5.34	6.07

Ball-Bearing Drawing Board for Freehand Work

In making freehand drawings the board must be turned and shifted frequently to accommodate the hand to different curves and lines. Every time the change in position is effected the fingers must be deftly inserted between the board and the table. I provided my board with four ball casters, as sketched, to facilitate this turning and shifting. The casters are a standard article readily bought anywhere. I found this board very valuable for freehand work.—E. Schwartz, Brooklyn, N. Y.



TWO VIEWS OF DRAWING BOARD, SHOWING HOW THE CASTERS ARE FITTED ON

Meeting of Rocky Mountain Coal Mining Institute

The fourth regular meeting of the Rocky Mountain Coal Mining Institute, with 42 members in attendance, was called to order Monday morning, Nov. 29, 1915, by President E. H. Weitzel, who delivered a short address.

Governor George A. Carlson of Colorado then welcomed the members on behalf of the State of Colorado. This was followed by an address of welcome by Mayor W. H. Sharpley on behalf of the City of Denver.

The minutes of the previous meeting held at Trinidad, Colo., June 8, 9 and 10, 1915, were read by the secretary. There being no corrections or alterations, they were approved as read.

An amendment was proposed by R. C. Hills to article 3 of the constitution, adding thereto, "and a publication committee consisting of three, including the secretary as an ex-officio member," so that the article will read: "The officers of this institute shall consist of a president; four vice-presidents, one to be elected from each state in which the institute operates; a secretary-treasurer; an executive board of 13 members, consisting of the president, the four vice-presidents and two other members from each state in which the institute operates, and a publication committee consisting of three, including the secretary as an ex-officio member."

Section 6 to be added to article 9, "Duties of Officers," will read: "It shall be the duty of the publication committee to receive and edit the papers to be read and issue with the notification circular a brief synopsis of each paper for the purpose of promoting discussion thereon; to arrange all copy for publication; read all proof, and assist in the distribution of the semiannual transactions."

The amendment was read and laid over until the next regular meeting for a vote.

The meeting then proceeded with the nomination of officers for the ensuing year. The president appointed a nominating committee consisting of Benedict Shubart, G. A. Kaseman, A. C. Watts and M. B. Urquhart. For the office of president the committee selected the names of E. H. Weitzel, W. J. Murray and John McNiel. A. C. Watts was nominated from the floor.

A ballot was then taken, and A. C. Watts having the majority of the votes cast, was declared elected and immediately assumed his duties of office.

The nominating committee then reported their selection of the following names: J. C. Roberts, Golden, vice-president for Colorado; F. R. Weitzel, Dawson, vice-president for New Mexico; A. H. Cowie, Salt Lake City, vice-president for Utah; W. D. Brennan, Cheyenne, vice-president for Wyoming; F. W. Whiteside, secretary-treasurer, Denver.

The names proposed for the executive boards of the following states were: Colorado, S. Dean, of Delagua, and W. C. Ferguson, of Denver; New Mexico, G. A. Kaseman, of Albuquerque, and F. A. Young, of Raton; Utah, E. L. Carpenter and G. A. Murphy, of Salt Lake City; Wyoming, William Monay, of Kemmerer, and Peter Kooi, of Kooi.

There being no contest for any of the offices, the secretary was instructed to cast the ballot for each of the names, and they were severally declared elected.

A vote of thanks was extended to E. H. Weitzel and Frederick W. Whiteside for their services to the institute during their respective terms of office. A vote of thanks was also extended to all retiring officers.

The president was authorized to appoint a jewel committee to select a token of appreciation for the retiring president. The following were appointed: Messrs. Urquhart, Kaseman, McGraw and McGowan.

Motion was duly made, seconded and carried that it be the sense of the institute that the elaborate entertainments of the past be discontinued at the regular meetings in the future, that no free entertainments be accepted by the institute and that each member pay his own expenses. The executive committee was appointed to suggest at the next meeting a suitable emblem for the institute.

Benedict Shubert was requested by the chair to read a paper prepared by John Bevan, of Colorado Springs, who was absent, the subject being "Colliery Explosions." There being no further business the morning session adjourned.

The meeting was again called to order at 2 : 30 p.m., with President A. C. Watts in the chair.

A paper was read by Mr. Watts, the subject being, "Features of Coal Mining in Utah, Principally in Carbon City." This was followed by a discussion.

At 8 : 15 p.m. the members and friends of the institute attended the Denham theater, where the production, "Under Cover," was presented in a highly creditable manner by the Denham Players.

At 10 a.m. on Nov. 30 the meeting was called to order by President Watts. A vote of thanks was extended to the committees on arrangement and entertainment for their efficient services in making preparations for the present meeting.

The secretary was instructed to extend a written vote of thanks to the management of the Albany Hotel for the use of the convention hall and for the many courtesies extended.

The following candidates having been regularly proposed, were balloted upon and declared elected: A. A. Young, John Murrell, William B. Phillips, William R. Chedsey, J. B. McKennan, Arthur V. Lindee, J. J. Thomas, David Williams, Ernest Curran, Morgan T. Townsend, Fred Carroll, Harry Wolf, Frank Dayton, Walter Macpherson, John McNeil, Jr.

A paper was next presented by Dr. William B. Phillips, the subject being, "Coal Resources of the West." This was followed by a long and interesting discussion.

On motion duly made, seconded and carried, it was

Resolved, That individually and collectively the institute lend its support to the School of Mines of Colorado and institutions along similar lines in our three neighboring states in which our institute operates toward the promotion of coal-mining activities and the establishment of a chair of coal-mining engineering.

Mr. Martin Maurer then presented a paper on "Tipple Scales." There being no further business the meeting adjourned.

At 1 : 30 p.m. members and friends of the institute left for a trip through Denver's Mountain Parks, stopping on the return at the gymnasium of the School of Mines, at Golden, where an enjoyable reception was held and refreshments served, after which the members were shown over the grounds and through the various buildings of the institution.

At 8 p.m. members and friends of the institute attended the Colorado Electric Show being held at the Auditorium.

Abuse of Blasting Fuse

Many miners, acting in good faith and recognizing the waterproofing quality of axle grease or crude oil, apply these lubricants to the outside of capped fuse so as to make a waterproof joint, but by so doing they only start trouble for themselves. Grease and oil are solvents of the fuse varnishes, and when they penetrate the outer covering they destroy the powder train in the fuse with as great, if not greater, rapidity than would the water that the miner is trying to exclude.

When preparing fuse for use, it is common practice to coil it around the arm as one would a clothesline. This is bad practice because kinks are liable to occur to break the powder train. When cutting off the fuse care should be exercised to cut it square across and not obliquely, for the latter method will leave a sharp point at the end of the fuse—not a particularly safe thing to jab into a blasting cap. Furthermore, if the point happens to be soft, as it is likely to be in warm weather, it will bend over or curl up and so will be liable to cause a misfire. Misfires are more likely to be due to lack of care on the part of the miner making up the primers than to fault in the fuse itself.

When making up primers, do not hesitate to cut an inch of fuse from the end of the coil. By doing this the damp end is cut off and is not put into the detonating cap. Fuse that has been hammered or injured by falling ground, or damaged from any other source, should never be used. Any change in the covering of the fuse will either increase the burning rate or have the opposite effect and cause a misfire.—*Engineering and Mining Journal.*

Anthracite 2,458,125 Tons Short

The total shipments of anthracite, as reported to the Anthracite Bureau of Information, for eleven months of this year were 2,458,125 tons less than for the corresponding months of 1914. Shipments of anthracite last month were 6,297,215 tons as against 5,928,286 tons in November, 1914, an increase of 368,929 tons. This establishes a new record for November. The largest previous shipments for this month were in 1911, when 6,193,314 tons were sent to market.

The amount of coal on hand at tidewater decreased 15,160 tons, from 625,821 tons on Oct. 31 to 610,661 tons on Nov. 30. The decrease in the amount of coal at tidewater has been going on steadily for the last three months and indicates that the stocks at tidewater are being drawn upon to make up for the slow sales last summer when the public failed to take advantage of the usual discounts.

The Lehigh Valley led in tonnage for the month with 1,190,103 tons; the Philadelphia & Reading was second with 1,163,851 tons; and the Delaware, Lackawanna & Western was third with 971,389 tons. The Jersey Central carried 762,140 tons, the Erie 696,890 tons, the Delaware & Hudson 694,386 tons, the Pennsylvania 616,190 tons and the New York, Ontario & Western 202,266 tons.

Extracts from a Superintendent's Diary

Tomorrow our camp will have its first community Christmas. The tree has been erected, the presents have been carefully assembled in our commissary wareroom, and the kids of our community have all been properly tipped off as to the possibilities of the morrow.

Every firtree standing within a radius of ten miles of camp has been inspected several times during the past week, and the one finally selected for the great occasion had to be admired and passed on by the entire committee before our timberman was allowed to cut it down.

Many were the plans proposed for the raising of the necessary funds to meet the expenses of the celebration, and in the end no single plan was adopted, but each one was instructed to consider himself a committee of one to carry out any one of the suggestions made and to remain as a committee until some money was obtained. The results were truly startling; enough money was collected to provide a suitable tree for a good-sized city. After buying all of the presents that we thought might be needed, we had enough left to enable us to hire a band

Ballads of a Coal Miner--X

Written expressly for Coal Age

Progress

By Berton Braley

WE'VE *got a new manager now*
Who's doin' things proper an' right,
For he's cleanin' up fine around tipple an' mine
Which was once an offense to the sight;
He's tearin' down dingy old shacks
An' buildin' new houses instead,
Where the walls ain't a sieve an' a feller can live
With a decent roof over his head.

WE'VE *got a new manager now*
Who's holdin' down tailin's an' dust,
An' is givin' a show for a garden to grow
Which used to give up in disgust;
He's bringin' us water an' walks
An' roadways that's decently wide,
An' he'll change this in time from a town that's a lime
To a fairly good place to reside.

I HAD *just about made up my mind*
That it wouldn't be fair to a dame
To talk wedded bliss in a dust heap like this,
But now it don't seem quite the same;
For in place of the shacks there is homes,
An' that makes a diff'rence somehow,
An' I guess we'll get hitched now conditions is switched,
For we've got a new manager now.

of 12 pieces for the entire day and also a caterer who will serve hot chocolate and wafers to all who come out to see what a community Christmas can be.

The committee intrusted with the responsibility of selecting the presents had the most strenuous time, and once or twice it looked as if they would have to agree to disagree. It was composed mostly of ladies, and, womanlike, they wanted everything to be suggestive of the spirit of Christmas. They are still undecided as to whether they displayed judgment in their selections, and they await tomorrow's events as anxiously as the children.

We have men of many different nationalities who have spent Christmas in many corners of the globe, and the celebration that they have planned promises to afford a goodly number of surprises. Several newspaper men have learned of the possibilities and are going to be on hand with their notebooks.

Even our absentee directors heard of our plans and requested permission to have a hand in the affair. They were allowed to send contributions of money, and the way they responded made some of our citizens who have been in the habit of saying unkind things about them feel pretty small. Already both parties to the misunderstanding have undoubtedly been repaid for all of the time and effort contributed.

One unlooked-for controversy stirred up by our proposed celebration had to do with the question as to what date should really be considered as Christmas. Since the Slavs were hopelessly in the minority in our camp, they finally agreed to join in the celebration in spite of the fact that they feel sure that we are crazy on dates. Nor were our Slavs the only citizens who had their plans disarranged by the community celebration. We have two German families in our village which for years past have each had a family Christmas tree annually. Year after year most of the families in camp have been given invitations to inspect both of those trees, and the next day, at the request of the exhibitors, a vote had to be taken to decide which one was the most artistic. The rivalry was keen, the tree ornaments were preserved from year to year, and new trinkets were constantly watched for. This year all of those treasured ornaments were turned over to the general committee, and it is doubtful if they can be returned. Truly ours is to be a community tree.

Photographing Mine Maps

By H. A. Williamson*

Hydrochinon (a coal-tar product) is practically the only developer used in the photographic studios of the various engineering departments of the mining and other companies that use the camera to reproduce their various maps. Hydrochinon comes from Germany, normally at a price of \$1.85 to \$2.25 per pound, but at present quoted at \$8 to \$12, with little or none available at any price. Hence these engineer-photographers will probably be glad to try the following formula which does away with hydrochinon:

Water	30 oz.
Potassium carbonate (C.P.)	200 grains (desiccated)*
Sodium sulphite (C.P.)	480 grains (desiccated)*
Potassium bromide (C.P.)	30 grains

*If crystal chemicals are used instead of desiccated, then use 1 oz. of potassium carbonate and 2 oz. sodium sulphite.

Just before use, add 3 grains of dry C.P. pyrogallic acid to each ounce of the solution required, using sufficient of the solution to cover the plate well, say about 16 oz. for an 11x14 plate in a tray 12x15. This 16 oz. should develop three to four 11x14 plates. Development should be complete, and of excellent density in line work, in 4 to 8 min.

After development is complete the plate should be transferred to a bath of water, 30 oz., and citric acid, 60 grains, and allowed to remain for a few minutes. From this bath it should pass to the regular acid fixing bath.

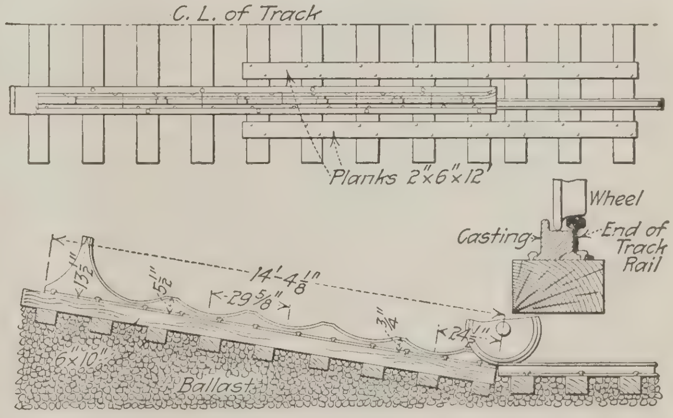
Slightly more contrast can sometimes be secured by adding a small quantity of potassium ferrocyanide to this developer. The temperature of all baths should be 70° F.

At present there is no scarcity of pyrogallic acid, which is quoted in quantity in the eastern market at from \$2 to \$3.25 per pound.

Car Stop of Novel Design for Use in Yard Tracks

A car stop that catches the wheels of cars instead of acting as a bumper has been applied by a number of railways, especially on stub tracks ending at streets or other points where it would be dangerous for a car to overrun the track. In the past a large number of very serious accidents have occurred at just such locations where the ordinary bumper had been installed by the railroad or mining company.

As shown in the drawing, the new bumper consists of two sets of castings forming a 15-ft. continuation of the track rails and having a series of concave depressions to engage the wheels. These castings are placed on 6x10-in. stringers, inclined to give a rise of 24 to 30 in. at the rear end. It would take very high speed to drive a car to the end of this device, and the raised end would then keep it from over running. The depressions are about 29 in. c. to c., with a drop of $3\frac{1}{4}$ in. for the first two and $5\frac{1}{2}$ in. for the others.



DETAILS OF ARRANGEMENT FOR STOPPING RAILROAD CARS

The car wheels ride on their flanges on the car-stop and the brakeshoes and rigging are carried clear of the ridges, as shown in the section in the accompanying drawing.

The device is made by the Saunders Car Stopper and Equipment Co., 113 North 2nd St., St. Louis, Mo. The Southern Railway Supply Co., St. Louis, is sales agent.

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*Fairmont, W. Va.

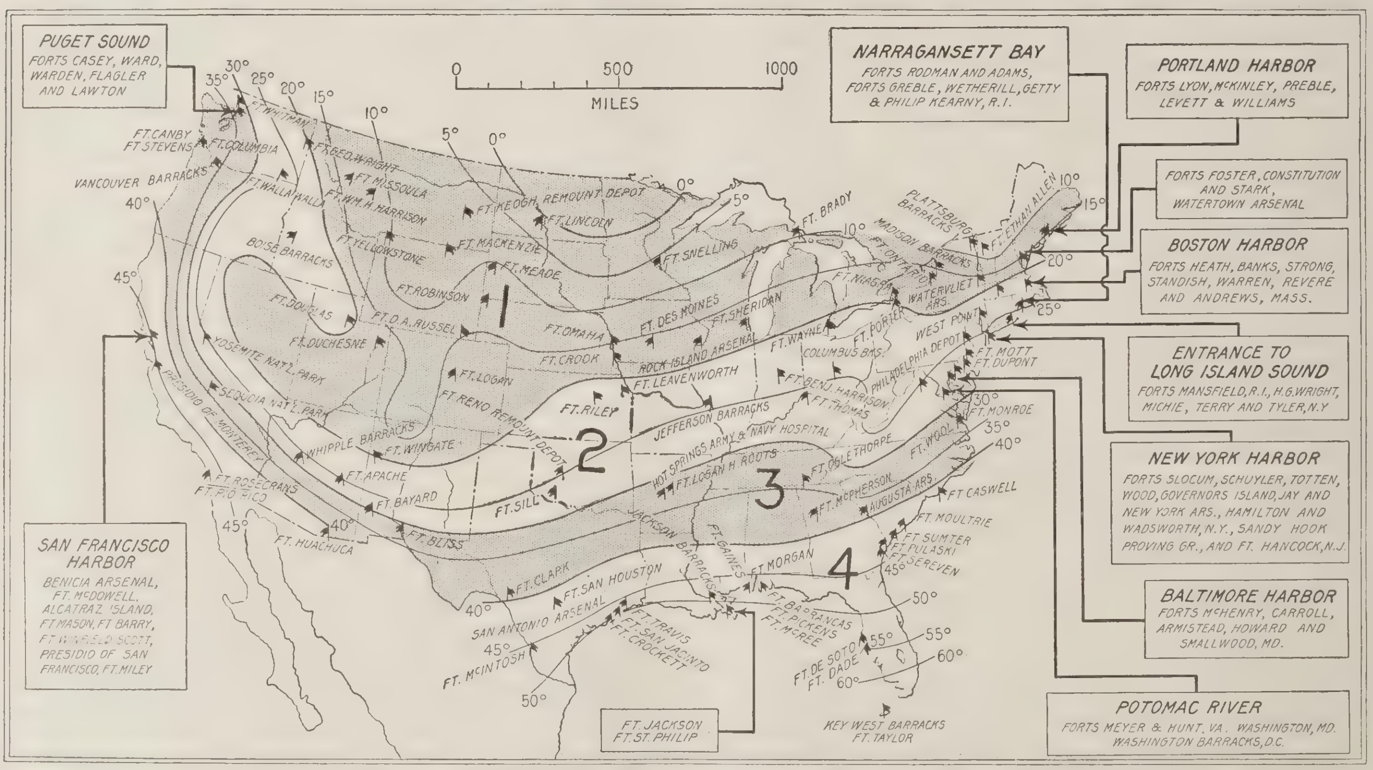
Burning Coal in the Army

By Marston Wilder*

SYNOPSIS—In years past coal was issued to men in the army according to their rank. This was conducive to much waste. At present the allowance of coal has been reduced to a thoroughly scientific plan. Not only is fuel purchased on the basis of its heat content, but it is issued according to climatic necessity and burned under the supervision of a trained fireman.

It used to be that coal was handled on the "hustle and use it" plan in the army. The easiest and quickest way the mineral could be bought, distributed and consumed was the means that best suited those who were compelled to handle it. As an illustration of the lack of consideration of the cost and value of the fuel an anecdote common in military circles serves best.

An officer who knew as much about coal as a prehistoric fossil was detailed to inspect several carloads delivered at a post by a contractor. He protested that he was not qualified to intelligently perform the task, but lack of knowledge availed him nothing in escaping the duty. Forthwith he went to see the coal and reported that it was black and that he thought it would burn.



ZONES OF EQUAL AND MEAN MINIMUM TEMPERATURE

For a long time Uncle Sam was generous with supplies of coal for military use. No scientific means of buying and using it was considered necessary. Officers were entitled to monthly allowances according to the rank they held. A second lieutenant might have an allowance of a ton a month, a captain two tons, a major three tons, a colonel four tons, and so on.

Of course the Government knew that it took no more coal to keep a colonel from shivering than a lieutenant, but the difference in allowance was due to the number of rooms that officers of different rank were entitled to have heated at public expense. The troops quartered in barracks were allowed stated amounts, derived from tables of equivalents showing the amount of coal in pounds equal to a cord of standard oak.

But now not only the buying, but the issuing and consumption of coal, have been reduced to a scientific basis. Allowances in all quarters and barracks are now determined by the square feet of grate surface, the size of the rooms in the buildings and other conditions recognized as factors in heating and cooking.

Formerly, when fuel was allowed on a basis of numerical strength of the garrison in men, the amounts allowed were uniform to a great degree throughout the army. Geographical locations did not make any decided difference. Army officers long recognized that there was a wanton waste of fuel because there was no one directly responsible for it after purchase and delivery through the army quartermaster's department.

Soldier servants were used at the officers' quarters for firing the heating apparatus, and soldiers fired the heating plants in the basements of the barracks. The officers sought to have men enlisted who were qualified to handle fuel scientifically and economically and who were expert in firing and caring for boilers.

A Scientific Policy Has Been Adopted

The War Department has just adopted a fixed policy. The first thing it did was to create the rank of fuel overseer in the quartermaster corps. It is the duty of

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*Fort Casey, Island County, Wash.

THE COAL STORAGE AT A THREE-COMPANY POST

this noncommissioned officer to superintend the delivery, storing, distribution and consumption of all fuel coming into a military garrison. In addition to these duties this soldier is a sort of foreman over all the men in a post who have the firing of heating plants in their charge. His services are designed as much to make a saving in boiler upkeep as to effect economy in the use of coal.

The firemen in the barracks are now required to keep a daily record of the amount of coal used and to record the temperature of the rooms. No such records were formerly kept, and fuel was used indiscriminately. The only vigilance exacted was that the firemen were not to exceed the monthly allowance, and as this was usually generous to a fault, coal was reduced to smoke just for the fun of it.

The fuel overseer keeps records showing the amount of fuel issued to buildings. He must also make daily visits to all firerooms to inspect methods of firing. When he thinks there is an improper use of coal, he is compelled to report it to the commanding officer for remedial action.

The new regulations provide that the use of fuel will be based, first, upon the area in square feet of grate on which the coal is burned; second, on the average outside temperature during the time the coal is burned; third, on a factor which takes into account the human element, or those charged with the operation of heating plants.

An elaborate system of charts has been published by the Government as guides in scientifically heating buildings. There is one set tabulating the temperatures from which a mean temperature for every post has been determined. There is another set known as coal-consumption charts, which have been prepared for various minimum temperatures from plus 40° to minus 40° F. at 10° intervals, and the allowable rate of combustion at any intermediate (average temperature) between 70° F. and the minimum on any chart is directly interpolated. The charts show the allowable coal consumption per square foot of grate area at the several score of posts for steam and hot-water boilers.

SOLDIERS' BARRACKS WHICH REQUIRE LARGE QUANTITIES OF COAL

Assuming that a building is equipped with a Century boiler of 2,200-ft. capacity, with 10½ sq.ft. of grate surface, the allowance of coal according to the proper chart for January would be determined thus: The temperature for the month is shown by the temperature chart as 35°. Interpolating on coal charts at 35°, it will be found that 3 lb. of coal per square foot of grate area per hour is the proper amount to be used. The fuel allowance for the month would then be found as follows: 3 lb. × 24 hr. × 31 days × 10.5 sq.ft. ÷ 2,240 lb. = 10.45 long tons.

DELIVERING CONTRACT COAL AT AN ARMY POST

Where coal at various posts has a different fuel equivalent per cord of standard oak, it is necessary to apply corrections for difference in equivalents. Thus at each post in the service throughout the country the quartermaster must work out the monthly allowance for each building and tabulate it for ready reference. Hence where fuel was once allowed on a basis of rank to individuals it is now allowed to the buildings.

Allowances for hot-water heaters may also be determined from the charts. Allowances are based on the assumption that anthracite and good coking coals are used. Where other coals are employed, corrections of the amounts must be made in accordance with the instructions for figuring equivalents. Each·cooking stove has a definite allowance of coal governed by the type and pattern of the army range in use. One range is allowed 2,500 lb. per month, another 4,500 lb. and a still larger one 6,000 lb.

The charts are most interesting documents. They show temperatures at all posts for many years back. All the leading capitals of the world figure in the charts, owing to the fact that the army has military attachés on duty abroad who must be taken care of in the matter of fuel. There is a separate chart for buildings equipped only with old-fashioned heating stoves. The zone charts cover every month. One of them is shown herewith.

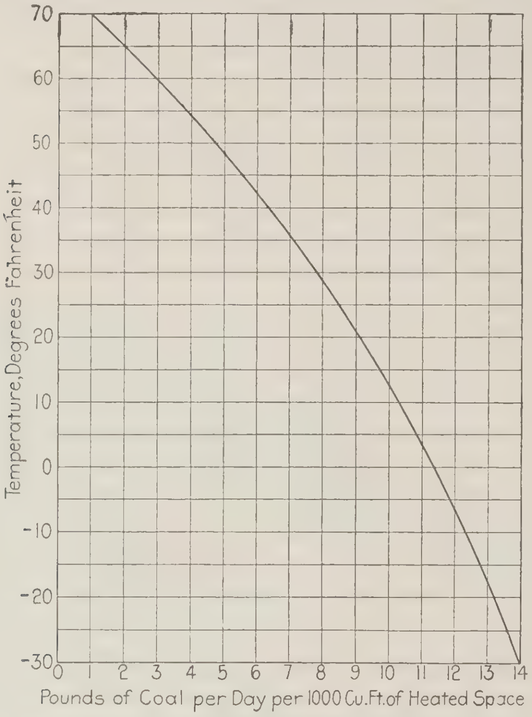

CHART SHOWING FUEL CONSUMPTION PER 1,000 CU.FT. OF HEATED BUILDING

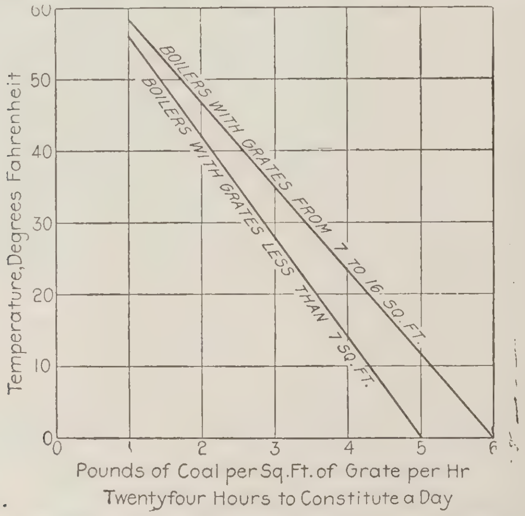

CHART SHOWING ALLOWABLE RATE OF COMBUSTION PER UNIT OF GRATES

Uncle Sam has some army posts where coal is burned the year round for heating purposes, and these are within the continental limits of the United States. When humanity is sweltering in summer heat in Eastern centers, the post on Puget Sound has fires going sometimes all day long and always during mornings and evenings. In our tropical possessions, of course, no coal is used at all for heating.

On the other hand it is reasonable to suppose that more fuel is consumed for heating purposes in winter at the posts in Alaska—where little is used in summer—than at Puget Sount posts 12 months in the year. For although the summers are cool and even chilly at times in Washington State, the winters are generally extremely mild.

The army now buys its coal on the B.t.u. basis. Formerly, the fellow who was lowest in price, and who therefore furnished only the cheapest coal, got the contract. Uncle Sam now pays for the heat delivered to him, not a "black substance that looks as though it will burn." Proposals are sent out in the early spring all over the country inviting bids for coal for each fiscal year beginning July 1 and extending to June 30 of the following year. These proposals are sent all bidders on request from the nearest chief quartermaster.

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The Eastern Freight Congestion

At the conclusion of a conference of freight-traffic men of the Eastern trunk lines on Dec. 14, these additional embargoes were announced, owing to the continued congestion and the large accumulation of freight:

The New York Central R.R. has embargoed all flour and grain products for export and also lumber and hay consigned for any lighterage deliveries.

The Erie R.R. has embargoed shipments of flour for export requiring "lighterage free" deliveries.

This is in addition to the previous embargo on flour when carried under through export bills of lading.

The Baltimore & Ohio R.R. has placed an embargo on lumber from the South destined to New York for export.

The Central R.R. of New Jersey has embargoed all traffic destined to New York for delivery to coastwise steamers and also traffic to the Pacific Coast for delivery to steamers at New York. Shipments of all classes of freight consigned to Brooklyn terminals have also been embargoed.

The Baltimore & Ohio R.R. on the same day declared an embargo on all grain for export through Baltimore.

At present there are 4,000 carloads of grain at Baltimore awaiting unloading and en route for export, in addition to which the local elevators of the road, having a capacity of 2,500,000 bu., are filled.

The Pennsylvania R.R. has posted the following notice:

Embargo 3,457—Owing to the large accumulation of traffic and to avoid if possible the absolute blockade now impending, embargo all freight, carload and less than carload, including traffic switched from connecting lines, originating at all points, except on the Pennsylvania R.R., P., B. & W. R.R. and W. J. & S. R.R., when consigned, reconsigned or to be reconsigned to New York lighterage, whether export, coastwise or domestic, except dressed meats and other perishable freight, flour and other foodstuffs for local human consumption. Shipments billed up to and including Tuesday, Dec. 14, will be accepted.

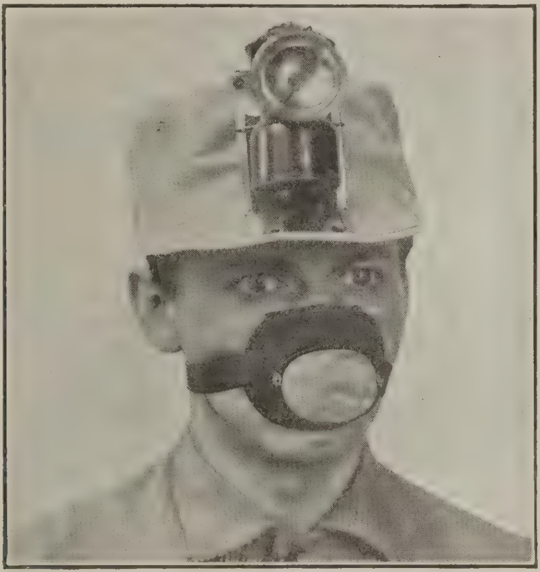
Embargo 3,458—Owing to the large accumulation of traffic and to avoid if possible the absolute blockade now impending, embargo all freight, carload and less than carload, including traffic switched from connecting lines, originating at all points, except on the Pennsylvania R.R., P., B & W. R.R. and W. J. & S. R.R. when consigned, reconsigned or to be reconsigned to Waverly, including Newark and points east thereof, and for connecting lines via junction points east of Waverly, except the N. Y., N. H. & H. R.R. This embargo not to include live stock, dressed meats and other perishable freight, flour and other foodstuffs for human consumption, coal for delivery at Harsimus Cove. N. J., railroad fuel supply coal for any line routed via junction points east of Waverly and coal for public service corporations. Shipments will be accepted billed up to and including Dec. 14.

New Apparatus and Equipment

A New Respirator

Most coal men are uncomfortably familiar with dust, both in the mines and in the tipples and breakers, but worst of all in the crusher rooms and on the yards at coke plants. While it may be an open question just how detrimental to life and health pure coal dust in small quantities may be, there is little doubt that the dense clouds of dust encountered wherever coal is crushed for coke making cannot exert any other than a harmful effect on the lining of the lungs.

It would seem rational to suppose also that the sharp, gritty dust which is unavoidably inhaled by the workmen while watering down and drawing coke from the ovens exerts an irritating and baneful effect upon the respiratory organs. Such dust is doubtless as detrimental to the health as is the dust from limestone or other rock.



THE RESPIRATOR IN USE

To provide a suitable protection against fine particles of matter of all kinds from entering the lungs and respiratory tract generally, the Multi-Metal Separating Screen Co., 68-72 East 131st St., New York City, has recently placed on the market what it calls its "Pulmosan" respirator. The screening material in this instrument consists of several thicknesses, each capable of arresting the passage of dust of a certain degree of fineness and each supplementing the others in action.

The body of the respirator is made of a soft, pliable material impervious to both air and water and covered with cloth upon each side. The whole instrument weighs but ½ oz. It may be crumpled up and carried in the pocket indefinitely. When wanted it may be removed from the pocket and adjusted to the face and nose almost instantly. It may be washed thoroughly either with or without soap. It fits any face and does not interfere in any way with the wearing of glasses or goggles. It also presents a neat appearance and does not interfere with conversation.

The manufacturer sells these respirators for 50c. each. They have been received with considerable favor in the metal-mining field as well as in numerous manufacturing processes where fine dust of an animal, vegetable, mineral or metallic nature is encountered.

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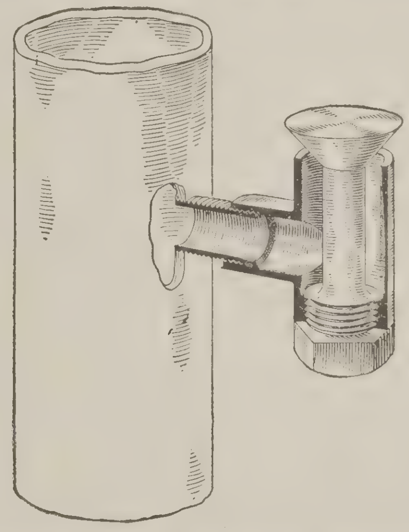
A Fire-Sprinkler Nozzle

A spraying nozzle that is thoroughly efficient and at the same time cheap can be made from a ½-in. tee. The upper part of the tee down to the lower threads is reamed out to a diameter of 1 in. and the upper end is faced off. A plug is made and inserted, as shown in the accompanying illustration. The lower end is threaded to fit the tee. The shank is turned down to ½ in., and the upper end is a cone of about 1½-in. diameter. In order that this cone may be accurately centered in the upper end of the tee, the threads of the lower end are tapped out while the tee is in the chuck for the reaming. If the cone is accurately centered, the spray is evenly distributed over the whole circle.

The amount of water discharged at any pressure depends upon the space between the upper end of the tee and the cone. This is adjusted by screwing the cone in or out, and the adjustment is maintained by a lock nut on the lower end of the plug. The pressure governs not only the amount of water discharged, but also the distance to which the spray is thrown.



THE SPRINKLER NOZZLE IN POSITION

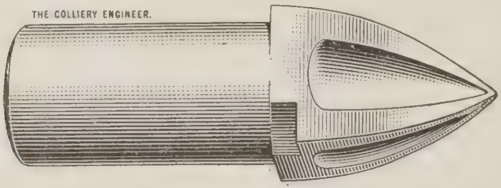
This nozzle, which is patented, is the invention of Dan Walters, master mechanic at the Hazleton shaft colliery of the Lehigh Valley Coal Co. At the breaker at this colliery 287 of these nozzles have been installed. With the pressure maintained by the pump, they will handle about 3,500 gal. of water per minute and distribute it to every corner of the breaker. They are so arranged that water may be turned into them by pulling a rope on the outside of the building. This makes it almost impossible for anything to interfere with getting water turned into the spray lines and renders the probability of serious fire much less. The nozzles are tested once a month, and the result is not only the knowledge that the spraying apparatus is in proper working order, but a good washing out is given the breaker.

One of the great advantages of this nozzle, in addition to its cheapness, is the fact that it can be attached to any line large enough to be tapped for a ½-in. tee. All that is necessary is to drill a hole in the pipe and thread it, put in a nipple and attach the nozzle.

Hollow-Ground Crusher Tooth

In order that coal may be broken down in size with the production of the smallest possible amount of undesirable fines, the rolls of the crusher should be provided with sharp teeth. The sharper the teeth the more cracking will be the action and with less of the objectionable crushing; in other words, the less fine sizes and the less power consumption.

Crushing is done best by a tooth having sharp edges, and commonly a square tooth is used. Of course the edges wear off rapidly because they do most of the cutting. Furthermore there is less metal at this point to resist wear, so that a tooth originally square would entirely lose its edges and become round if it were used long enough.



HOLLOW-GROUND CRUSHER TOOTH

In order to increase the useful life of the crusher tooth, the Wilmot Engineering Co., of Hazleton, makes use of the principle of the hollow-ground tool. The accompanying illustration shows that the middle of each face is depressed so that the edges can be worn away to a considerable extent before they become so dull as to produce too much fine coal and consume too much power.

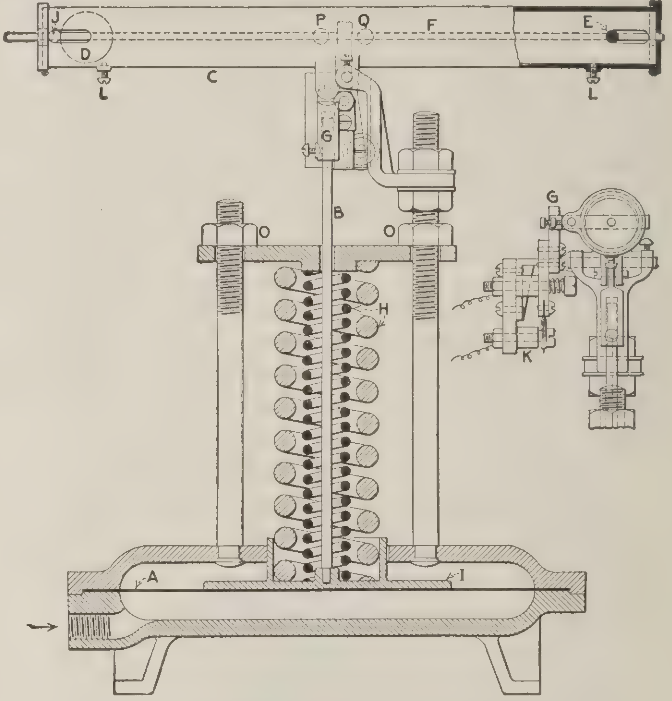
These teeth are drop-forged. They are made from high-carbon steel, so that they last for a long time. They are set in geared rolls running at speeds not greater than the velocity with which the coal drops into the crushing space. Therefore there is practically no pulverization by impact, as is the case with high-speed rolls.

Device for Controlling Pumps

A new device for automatically controlling motor-driven pumps and similar devices for filling tanks, standpipes or other water containers or for ringing signal bells has been recently placed on the market by the Golden-Anderson Valve Specialty Co., of Pittsburgh, Penn. This device automatically maintains within predetermined limits the level of the water in the tanks, standpipes, reservoirs or other containers, and does away with the annoyance of floats or other fixtures.

The pressure from the tank is communicated to the under side of the diaphragm *A* and forces the rod *B* upward, tilting the cylinder *C* and permitting the ball *D* to roll to the opposite end. There it hits the pin *E*, which is attached to the horizontal rod *F*, causing the stop *D* on the rod to move the lever or switch *G*, thus breaking the electrical contact and stopping the motor.

When the water level in the tank is sufficiently lowered, the springs *H* force the diaphragm *A* downward. The rod *B*, attached to the diaphragm plate *I*, causes the cylinder *C* to reverse its inclination, allowing the ball *B* to roll to the opposite end, striking the pin *J* which is attached to the horizontal rod *F*. This causes the stop *Q* on the rod to move the lever or switch *G*, making the contact with the post *K* and starting the motor again.



CONTROLLING DEVICE FOR PUMPS

The setscrews *LL*, shown at each end of the cylinder, are for the purpose of securing different variations of water level in the tank. The adjusting nuts *OO*, above the springs *H*, are for the purpose of obtaining the different heights of water desired in the tank or standpipe.

Coal Resources of North Park in Colorado

North Park, a great natural depression in the Rocky Mountains of northern Colorado, is described in a recent geologic and economic report by A. L. Beekly, of the U. S. Geological Survey, just printed and now being distributed by the Survey as Bulletin 596. The region is far from frequented routes of travel, its remoteness amounting until recent years almost to isolation, so that its geology and its economic resources have remained but very little known. The park includes practically all of Jackson County and is surrounded, except on the north, by mountain walls that rise 2000 to 5000 ft. above the bottom of the basin.

Some of the coal beds are in places very thick, one measuring at one place 66 ft. and at several places more than 50 ft. The coal is sub-bituminous and is remarkably clean. Although the high cost of railway transportation and the higher quality of the coal in neighboring more accessible fields would suggest that the demand for the coal would be practically limited to the park itself, yet the one coal company operating in the park on a commercial scale has marketed considerable tonnage of coal in northeastern Colorado and southern Wyoming.

The Labor Situation

SYNOPSIS—Strike occurs in the anthracite region over the steam use of small coal. Florence and Adrian mines in central Pennsylvania resume operations. The Ebensburg Coal Co. enjoins the union at Nanty Glo. Alexander Howat, one-time union president of the Kansas district, is charged with giving a loving cup to Charles S. Keith. A suit charging $500,000 damages is brought against the union in Arkansas.

The 12 foremen at the Diamond colliery in West Scranton belonging to the Delaware, Lackawanna & Western R.R. coal department, complained recently because No. 2 barley coal was supplied them for firing the boilers. They claimed that more work was occasioned by the small size of the fuel. As it seemed that their demands were unlikely to receive favorable consideration from the company all the men of the colliery to the number of about 1,500 decided to go on strike Dec. 8. On the following day the difficulty was settled after a conference between Arthur C. La Monte, the mining engineer of the company, and John T. Dempsey, district president of the union.

The company agreed to furnish the fireroom with No. 1 barley, a size larger than No. 2. The same number of shifts will be maintained, but if the coal furnished results in the total amount of coal shoveled being reduced 75 per cent. of one man's capacity, one car of No. 2 barley will be used daily, and if the amount shoveled is reduced to 75 per cent. of two men's capacity, two cars of No. 2 barley will be dumped into the boiler room every day. The whole requirement of the plant is three cars per day.

Adrian and Florence Return to Work

The 850 miners of Adrian and Florence in Jefferson County, Pennsylvania, have declared their strike at an end after having been idle since Nov. 22. The miners met in joint session, and on Dec. 9 the Adrian men returned to work. The Florence men were delayed by the condition of the mine till Dec. 11.

In a conference held Dec. 7 between B. M. Clark, attorney for the Rochester & Pittsburgh Coal and Iron Co.; Frank Pardoe, assistant general manager of the same company; James Purcell, district president of district No. 2 of the United Mine Workers of America, and James Marks, a board member of Du Bois, Penn., a compromise satisfactory to all concerned was contrived by the conferring parties.

Injunction Against Union Secured at Nanty Glo

The Ebensburg Coal Co. on Dec. 7 secured an injunction against the United Mine Workers of America for interfering in the operation of the No. 1 mine of Nanty Glo. The affidavit accompanying the petition for an injunction declares that Thomas King, Gazzy Carrol, Armando Pelizarri and several others on Nov. 30 went onto the grounds of the Nanty-Glo Coal Co. and attempted by persuasion and coercion to prevent the men from going to work for the company. The affidavit also states that the petitioners believe that the United Mine Workers of America is paying the moving expenses of some of the employees for the purpose of depriving the company of their services.

The partial strike of the miners employed by W. H. Hughes & Co., at Lilly, Cambria County, Penn., has come to an end after a four-month disagreement. The mines are working about half-time owing to a shortage of cars.

A Loving Cup which Caused Much Heartburning

The libel suit brought by Alexander Howat, ex-president of district 14 of the United Mine Workers of America, against certain persons who alleged that he had received bribes from the Southwestern Coal Operators' Association is still creating much excitement. Joseph H. Hazen, superintendent of the Chapman Coal Co., at Mulberry, Kan., and an agent of the operators testified on Dec. 9 that A. Howat and Fred Holt, the secretary-treasurer of the district union, presented him with a loving cup in September, 1910. Mr. Hazen said the cup was understood as "coming from the union" and was presented after he had paid Howat and Holt $10,000 for their influence in securing a favorable contract with the striking miners. The cup was "for Joe for his help in consummating the contract."

In 1913 rumors began to circulate, and several mine workers came to Hazen's office to see this wonderful loving cup, and Hazen testified that Howat gave $10 to buy a modest substitute with an inscription "Presented to J. H. Hazen for services rendered Chapman Coal Co." This fake cup was to be shown all miners of too inquiring a disposition, but unfortunately there was a photograph of the original loving cup, and worse yet, this photograph appeared in the window of a newspaper office at Pittsburg, Kan. It is not known where the picture came from. Hazen handed the cup to Keith and desired him not to make a photograph of it. In his testimony he said he presumed the cup of love and discord was in Keith's safe.

Despite Alleged Graft Howat Became Penniless

Though Howat was declared to have received large sums of money for his services, it was alleged that in 1914 he was penniless and asked for a loan. This was after the disclosure which followed the filing of the Bache-Denman suit. Howat told Hazen according to the latter's testimony that he did not blame him for his exposure of the bribe in court, but he objected to his saying that Howat received more money than Holt.

Later according to Hazen, Howat was paid $30, and he asked for $1,000 to go to Illinois to get married, agreeing to leave the district for good. Keith refused to give him money, but according to Hazen he promised to give Howat a job in Wyoming.

The Pennsylvania Mining Co. Wants $500,000

The Pennsylvania Mining Co., of Arkansas, with offices at Scranton, Penn., which operates mines at Clarksville, Ark., in Johnson County, filed suit on Dec. 8 against the United Mine Workers of America charging a "national conspiracy to monopolize the coal-mining industry of the United States." The local, district and international officials are sued and recovery of $500,000 damages is sought.

Since the company was organized in 1910, it has been operating "open shop," and the defendants, the company alleges, have frequently attacked the corporation. After the company's workmen went on strike in June and the men joined the union, men who still worked at the plant were assailed by masked men, its pumps and filtration plant being destroyed.

The petition desires the courts to garnishee a large number of coal companies in Arkansas, Oklahoma, Kansas and Texas to hold funds which these companies have collected for the union. John P. White, the president of the international union, and K. C. Adams, national publicity agent, are named among the defendants.

To Re-Establish the Interstate Agreement

An attempt is being made by President J. P. White, of the United Mine Workers of America to restore the interstate scale meeting. He has invited the operators of Ohio, Indiana, Illinois and western Pennsylvania to meet with the mine workers' officials in Indianapolis and discuss the matter. No date has as yet been set. The four-state agreement ended in Chicago about two years ago, the meeting closing without the pact being renewed.

The United Mine Workers have engaged Tomlinson Hall for their mammoth biennial convention which is to last from Jan. 18 to Feb. 4. The Indiana Retail Hardware Dealers were to occupy the room for the week of Jan. 24, but they will now meet in the German House. There will be about 2,000 persons present, and the City of Indianapolis will not be asked to contribute a cent to the entertainment of the delegates.

Recent Legal Decisions

Pollution of Streams in Mining Operations—"To so pollute a stream by mining operations that the waters are impure and unfit for domestic use" of downstream land owners "and from which noxious gases and disagreeable odors arise rendering property used as a residence less comfortable gives a right of action for damages, and this is true regardless of the methods of operation, negligence in such cases not being a necessary predicate to the cause of action." (Alabama Court of Appeals, Yolanda Coal and Coke Co. vs. Pierce, 68 Southern Reporter, 563.)

Right to Eject Intruders—In dismissing a suit brought against a coal company for assault and battery committed by one of its officers in ejecting plaintiff, a discharged employee, from the company's office, the Kentucky Court of Appeals adopted the following rule in the case of Lunsford vs. Hatfield Coal Co., 178 Southwestern Reporter, 1166: "It is the undoubted right of a lawful owner or one claiming title and rightfully in possession or of an occupant of premises to retain possession and to use such force as may be reasonably necessary to remove therefrom trespassers or intruders or persons originally on the premises by license or permission who subsequently create a disturbance or conduct themselves in an improper manner and refuse to desist or leave on request."

Who's Who in Coal Mining

Arthur C. La Monte

Arthur C. La Monte has been a member of the mining department of the Lackawanna R.R. for more than a quarter of a century and is now general manager.

Mr. La Monte was born in East Worcester, N. Y. When he was 14 years old his parents went to Scranton. After graduating from the Scranton high school he was employed by the Central Railroad of New Jersey at the time when it was being built into Scranton. After the work was finished, he was offered an opportunity to continue with the company, but it would have been necessary to leave home so he gave up the work and entered the employ of the D., L. & W. That was 26 years ago.

A position as chainman in the engineering corps was his first job. Feeling the need for more education, Mr. La Monte studied at night with the help of E. A. Bartel, who was then assistant chief engineer. Thirteen years later, in 1902, Mr. La Monte himself became assistant chief engineer, and in 1905 he was made chief engineer.

ARTHUR C. LA MONTE
General Manager of the D., L. & W. mines

Now, at the age of 46, he takes the place made vacant by the resignation of Col. R. A. Phillips, who is recognized as one of the best of the executives and mining men in the anthracite district. It would be hard to find a record showing fewer changes than that of Mr. La Monte. The Lackawanna has appreciated a good man and treated him well. The promotion was a great surprise to him, but he has earned it, and his associates in the Lackawanna are genuinely pleased by it. He has grown up in engineering work and loves it and leaves it with regret, but the higher officials of the company know that he has the ability to fill the larger position and need him in it.

Mr. La Monte is a past president of the Engineers' Society of Northeastern Pennsylvania and a member of the Peter Williamson Lodge of Masons. For years he has been chairman of the committee in charge of the Railroad Y. M. C. A. in Scranton.

All through the anthracite region he is known as a square man, and no one ever doubts his honesty. He does his best for the Lackawanna, but never at the expense of the public. If there is a little pillar coal somewhere which could be taken out easily, but which is supposed to stay in the ground, the coal stays in. And the Lackawanna has very little trouble with anyone.

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Paying the Piper

The anthracite coal miners are now asking a 20 per cent. increase in wages at the next readjustment, doubtless in the expectation of taking on compromise somewhat less. The operators say that this would add 41½c. a ton to the cost of domestic coal. They reach this conclusion by showing that one-fourth their output comes in steam sizes, which must sell in competition with bituminous coal, and so cannot be advanced in price; that one-tenth of the anthracite output goes into operating the mines, and that on the quantity that remains to sell to the forgotten man of everyday life the extra $22,000,000 of payroll would fall. This, the operators believe, would amount in practice to an advance of 50c. a ton in retail prices.

It is an interesting question how far the public is willing to pay for the gratification of its benevolent desire to see wages raised on every hand. When it appeared that these came out of the plutocratic mine owners, that was one thing, but as it is gradually dawning on the public that wages reflect themselves in the cost of commodities, in the threat of six-cent fares, etc., the situation looks different. In earlier times the employer, whether in coal mines or railways, bought labor in the open market at prices determined by the law of supply and demand. The community now decrees the wages.

Whenever a great body of employees go out on a strike, public opinion compels the employer to yield to arbitration whether he could hire other men to take the vacant places or not. And arbitration always comes out the same way. It means an advance, perhaps one-half or one-third as much as the employees ask, but still an advance. And this finds justification in the increased cost of living, due in part to successive advances in wages in other callings. For example, advances in coal costs in recent years undoubtedly furnish an argument for increased wages for our street car and steam railroad operatives. The latter, in their turn, carry scores of commodities upon which the miners depend for livelihood, the prices of which are spiraling upward.

Where are we coming out? The law of supply and demand works automatically, even though with some palpable hardships. Its giving way to wage regulation by public sentiment, as expressed through arbitral boards, raises the possibility of serious complications, not least of which is the likelihood that the more numerous body of employees, because of their greater power over public sentiment, will get better wages, other things being equal, than some less numerous body that may deserve more of their employers. And then, what are the people who sell their wages and products, according to the law of supply and demand, like the farmers and countless small industrial workers, going to say of matching pennies with those whose wages depend on the community's measure of benevolence?—Boston (Mass.) *Morning Herald.*

Editorials

Secretary Garrison and the Army in Colorado

Secretary Garrison in his annual report gives much praise to the action of the regulars in Colorado, as follows:

> Injected in the midst of an inflamed populace lately in open conflict they restored and maintained order. Their poise, justice, absolute impartiality and effectiveness not only applied the proper corrective to the situation on the ground, but commended them to all, whatever the individual sympathies might be, and highly commend them to us. Such a demonstration of the spirit which animates and controls the American army must make every citizen proud thereof.

The army truly showed its efficiency in overriding without violence the rights of the operators. It forbade the opening of mines and the hiring of men. Its poise and effectiveness cannot be denied, but justice and absolute impartiality were so corrupted at their source by the orders of their civil heads that the less said about them the better.

It was decided when the troops entered Colorado that the *status quo* with only violence removed was to be maintained. The mines shut down by union violence should not start operations; the men driven away by the union should remain away while the army was in control. And it was so. Perfect poise and efficiency may be granted, Mr. Garrison, but justice and impartiality are other matters.

The Trend of Conditions on New Coal Contracts

The most important contract news at Philadelphia is the announcement of the new prices by the anthracite companies. Contrary to expectations the leading companies are offering to contract only for the first three months of the new year, but the most surprising feature is that the prices have been increased. The increase amounts only to about the state tax, except on buckwheat, which is considerably more, but consumers were notified that the prices are strictly net, and there will not be any refund of the tax on this coal. It is intimated that this increase has been made to meet the expense of insurance under the compensation law effective Jan. 1.

An advance in the prices seems to have been forecasted by the only contract of any size that was let in this vicinity during the past few weeks—that of the Philadelphia County Prison for 2,000 tons of buckwheat coal (No. 1,637, pp. 870, 959). In this instance the company which formerly had the contract entered a bid at a much higher figure than on the old contract. Other bids were also at high figures, and the contract was finally awarded to a retail dealer, which is something unusual.

The trade is somewhat at a loss to understand why the companies will contract for only three months. In previous years when a wage scale was to be arranged, the usual contracts were entered into except for the addition of a stringent strike clause.

In the face of the new prices the consumers have been somewhat slow to tie up for their supply, even though it is already late in the season. On the other hand the individuals are known to have been in the market for some time with prices at the old figures and are willing to contract for the entire year, with the strike clause of course inserted.

Another item of interest in the contract market is the fact that the City of Philadelphia has not advertised for proposals to supply coal for the various departments. Last year bids were called for on Dec. 6 (No. 22, Vol. 6, p. 933). It may be that on account of the complete change in the administration the bidding on this large contract will be deferred even beyond the end of the year, as has happened on a previous occasion.

The price war on 1916-17 contracts inland from Boston, Providence and other New England distributing points began a month ago to extend to other places where steamers and barges could make deliveries. With almost no publicity and in less than a fortnight a large volume of such business had been closed. Corporations like the Amoskeag Manufacturing Co. (130,000 tons), the Bay State Street Ry. (120,000 tons), the American Sugar Refining Co. (70,000 tons) and F. W. Bird & Son (65,000 tons) bought their coal for the year beginning next April with only a few shippers knowing they were in the market. Only those in the closest personal touch had an opportunity to submit prices. While there is no positive information available, it is understood that most of these contracts were placed at prices well under the figures of early in the year.

Meanwhile the spot market developed rapidly. When water freights advanced to \$1.50 to Boston for prompt boats, options were quickly exercised or were withdrawn. No agency is now so keen on closing contracts as a month ago, and the buyers who neglected to accept propositions are in a difficult position. Now that water freights to Boston are \$3 or more and all-rail coal is selling up to \$2.75 at the mines, new sales in New England are likely to be almost exclusively of a spot character.

The comparatively few bids received by the Central Purchasing Committee at New York for furnishing less than 10,000 tons of anthracite and bituminous coal (No. 1,633, pp. 828, 911 and 959) impressed the city authorities with the fact that coal men are not anxious to tie up on contracts under present conditions. Only 11 bids were received, although about 50 proposals were sent to various dealers who are usually among the bidders for city work. This was due to the fact that the wage agreements in both the anthracite and bituminous regions expire on Apr. 1, and with the present condition of car and labor supply most dealers were not desirous to make contracts. The city will advertise some time this month for sufficient coal to tide over the various departments under the control of the committee until next summer.

Steam contracts awarded in Ohio during the past month have tended toward higher levels. This is especially true of contracts made by public service and state institutions. Several state contracts were awarded by the Ohio Board of Administration. This board has charge of all the state institutions, and its coal contracts range from 3,000 to 12,000 tons for each institution. In all recent contracts prices for mine-run and slack have been about 5c. a ton higher than during the previous season.

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Right To Choose Laborers

It has been said that the Workmen's Compensation Board in Pennsylvania would put three questions to every corporation or individual who seeks exemption from carrying liability insurance. The reply to these questions must state that no discrimination shall be made in favor of unmarried men, young men or foreigners.

It may be well indeed to require the self-insuring individual to promise to take the married with the unmarried, youth with age and the native with the naturalized and newcomers, but whether it is constitutional or even legal is another matter. The courts may well rule that the discretion of the board relates only to the sufficiency of the security and that the action of the commissioners is entirely *ultra vires* when it is applied to the character of the men employed.

Old and feeble men are by the ruling of the board to be given an equal chance to be killed in hazardous occupations with the young and virile. Perhaps later, men with one arm or a game leg must be provided with work in a dangerous location just as freely as men in their prime. Apparently men with weak hearts are to be given jobs which are quite likely to cause that susceptible organ to fail. There is to be no discrimination in favor of the fit.

It is questionable whether this disposition to force round pegs into square holes is really for the advantage of the workingmen. It seems almost certainly unconstitutional and illegal, though as to desirability there may well be two opinions.

Section 305 of Act 338 clearly states that "an employer desiring to be exempt from insuring the whole or any part of his liability for compensation shall make application to the bureau showing his financial ability to pay such compensation, whereupon the bureau, if satisfied of the applicant's financial ability, shall by written order make such exemption."

There is more to the same end, but enough has been quoted to show that the operator can still hire and discharge whom he will, and the bureau cannot say him nay. He can well refuse to answer the three questions which the commissioners are not entitled to ask him.

* * *

Conservation and Waste

For many centuries it has been customary to regard the conservation of material as the only form of conservation worthy the name. It is only recently that we have learned to look with solicitude on the waste of labor and laborers. However, we do not yet realize the true importance of productive labor. A few apples fall to the ground and are wasted, and everyone deplores the loss; tons of coal are buried underground, and conservationists bitterly bewail the waste, but we go into the market and find men all the day idle without any regret, though the men thus living without toil not only throw away their own lives, but the large body of material which they consume.

So the industry owes a debt to H. M. Chance for his remarks at the dedication of the Mines Building of the School of Mines of the Pennsylvania State College on Nov. 5, when he pointed out that too many of the conservationists belie their name and promise only to replace a prodigality in the use of material by a far more wasteful prodigality of labor.

But Mr. Chance carried his argument too far when he said that it did not pay to remove all the coal except in longwall work. He went too far when he assumed that the pillars could not be removed in room-and-pillar works without using some artificial substitute, for in some places where 95 per cent. of the coal is recovered, the cost of that conservation is little or nothing.

There is no question but that larger recoveries with economy could be made all over the United States, except in the Pocahontas, Georges Creek, Fairmont and Connellsville regions, where the waste is already negligible. It may be added that in few districts are pillars now left for the purpose of supporting the roof. Pillars are abandoned either because, as mining is conducted, it does not pay to clear the way to them or because it is impossible and unsafe to remove them. The operator does not care if the roof does fall in abandoned rooms, and in most cases he hopes it will, so as to make a squeeze less likely.

The loss in mining is not as great as has been often stated, but most of it is deplorable and not to be defended by any argument of economy. Only where the surface is extremely valuable is a waste of fuel for roof support excusable, and even in those cases it at least calls for an adequate and careful defense.

* * *

Coal Mines Need Men

In our Dec. 4 issue we published a short note stating that a number of miners in Texas had expressed to us their desire for aid in effecting a change of employment, or rather a change of location. These men have been working only one or two days a week and find it nearly impossible to live on the income thus afforded them.

Following the publication of this note a number of mining companies in other parts of the United States have both written and telegraphed us, offering employment to any number of worthy miners. This confirms us in the belief that miners in any part of the United States can now find steady employment if they will only look about them. One company in southern West Virginia wires that it can accommodate 10 families at once. The coal seam at this mine averages from 4 to 5 ft.; competent miners can earn from $3 to $4 a day.

An interesting letter from a very large Canadian company says: "We need experienced hand-pick coal miners; also men for shooting and loading coal after mining machines. A number of puncher-machine men are likewise desired. We have steady work all the year round for miners. However, we cannot employ men who are natives of the countries at present at war with Great Britain."

We will be pleased to coöperate with mining companies as well as miners in bringing the right man and job together, thus meeting the large demand for mine labor.

Sociological Department

Dr. August F. Knoefel

Of all the forces tending to promote first aid and good-fellowship in the Middle West stands out most prominently Dr. August F. Knoefel, of Terre Haute, Ind. He is one of the few men who believe that every man and every association of men can be organized for humanitarian work. Not a few of the purposes which induce a man to join a union may be used for the aid of the industry.

A man joins and gives his good money and services to the union because he believes in solidarity or in the seeking of advantages for others while he is laboring for an improvement of his own condition. It is for this same laudable reason that the miner joins a first-aid association. In fact there is an idealism in both which is of like, if not equal, value. There are two ways of looking at the union—as a mutual association of the men or as a dissension with the operators.

DR. AUGUST F. KNOEFEL

But Doctor Knoefel looks at the existence of the union as a recognition of a social duty, and as a result he believes that the union man as a member of the union can well be brought to foster first aid.

Little by little the miners are beginning to see that their view and the operators' view that union means dissension with the operator is a delusion wherever the collective bargainers are reasonable. Of course they are not always gifted with reason and the differences are not always easy to determine. But still there is always the possibility that the union will be what its name implies and not merely an instrument of aggression.

Dr. August F. Knoefel, formerly chief surgeon for the Vandalia Coal Co., was the third president of the American Mine Safety Association, replacing John P. Reese, a man who had a quite similar viewpoint. The entry of the association as a body into the National Safety Council as the mining section involved a reconstruction in which H. M. Wilson became chairman, H. M. Wolflin, secretary, and B. F. Tillson, Harry Davis and W. A. Luce, vice-presidents, but nevertheless Dr. A. F. Knoefel and John P. Reese remain the leading figures in the Middle West, where their helpful certainty in the excellence of people in general enables them to aid in inducing the unions to take a leading part in first-aid activity.

Old Company Prize Scholarship

The Lehigh Coal and Navigation Co. has offered a scholarship in Lehigh University as a prize to that student in its schools who shall pass the entrance examination to Lehigh with the highest grade. The prize was announced at the annual banquet of the Panther Valley Mining Institute last October, and there are 18 contestants now preparing themselves for the examination. It is the plan of the company to expend about $350 per year for the full period of four years, so the prize is well worth striving for.

The institute school for the present year has an enrollment of 239, with an average attendance of 162. The classes, with the number of students in each, are as follows:

Subject	Enrollment	Average Attendance per Month
Scholarship	18	18
Mining	30	16
Mechanics	23	19
Electricity—		
Beginning	41	26
Advanced	6	5
Primary	85	53
English	36	25
	239	162

Last year the enrollment was 175, and the attendance fell off considerably toward the end of the year. The reason for this is interesting. It was not owing to dissatisfaction or failure to progress, but to the fact that a considerable number of scholars in the primary and English classes thought that they had learned all that was necessary when they could read fairly well and solve some simple problems in arithmetic.

In the class in mining care is taken to instruct the students in practical subjects. The certificate given at the end of this course shows that the student has passed an examination equivalent to the mine foreman's examination. The success of the work is well demonstrated by the fact that no student who has completed the mining course and then taken the state examination for mine foreman has failed to pass.

The students are all employees of the Lehigh Coal and Navigation Co. Membership in the institute costs $1 per year, and this includes the banquet, which is alone worth more than the subscription paid. The only expense to students is that for books furnished at cost. The total expense for a course is never more than $2.

Discussion by Readers

Output of British Coal Mines

Letter No. 1—My attention was drawn recently to the editorial relating to the output of British mines, as referred to in a paper read before the North of England Institute of Mining Engineers by Samuel Dean, an Englishman now engaged in coal mining in this country. Permit me to say that many of the statements made, *Coal Age,* Nov. 6, p. 762, are, I believe, misleading.

Having spent 30 years of my life in the coal mines of South Wales, having performed almost every class of work, including the management of mines, and feeling that I understand most of the conditions that control the output of English mines, I beg to refer to a few of the conditions that must be considered in this connection.

Difficulties Encountered in Welsh Mines

The coal mines of Great Britain have generally a larger quantity of firedamp generated in the workings than the mines of this country. On this account, most of the mines here can use electric mining machines for cutting the coal, while the mining law of Great Britain prohibits the use of electricity in coal mines beyond the bottom of the downcast shaft.

Again, with respect to blasting the coal, the mining law of Great Britain expressly prohibits the use of powder in dry and dusty mines. It stands to reason that where it is possible to blast down the coal with powder, as in most mines in this country, a larger quantity of coal can be mined per man per day than where the coal must be brought down with wedges and hammers.

Again, coal is mined at a greater depth in Great Britain than in this country, and this causes a greater roof and side pressure in all rooms and entries. If the same difficulty were encountered in maintaining the roads, aircourses and rooms here as in Great Britain, many of the mines in this country now being worked would be obliged to shut down owing to the extra expense incurred in their operation. The cost of upkeep or maintenance of roads in Welsh mines is greater than that in any other mines in the world, as every coal digger in the mines of South Wales has a dayhand. Under such conditions, an output of 1 ton per man per day is considered good, and it is often not more than three-fourths of a ton per man. Also, owing to the great depth of the coal below the surface, the cost of sinking is much greater in Great Britain than in this country. Moreover, the mining law there compels the operator to line his shaft with brick.

Equipment of Mines Uptodate

Regarding equipment, there are mines in South Wales that will compare favorably with any in the world. Some of the mines put out 4,000 tons of coal in 8 hr. With regard to the capacity of railroad cars in Great Britain, this varies from 7 to 20 tons. Such cars were built eight years ago when it was found that larger cars would not suit the conditions in the mountainous country of that section, where the track curves are often very sharp. The capacity of the mine cars used underground varies from 3,000 to 4,000 lb., which shows that they are not such small cars after all.

In some of the mines there are coal seams not more than 2½ ft. thick, and in a few instances the thickness of the coal does not exceed 2 ft. In these mines the roof is taken down so as to give sufficient height for the horses to take the cars to the face of each room. In the Clydach Vale mine, owned by D. A. Thomas, who is at present in this country as agent for his government, horses are employed that measure from 14 to 18 hands high. Some of these animals cost from $300 to $500 each. The fact that they take the cars to the face of each room shows that much work is done to maintain sufficient headroom on the roads. An inspector is employed by the company to see that this is done, and where there are marks showing that the horse rubs against the roof, the place is stopped until this can be remedied. From this description, I think it will be easy to see that British mines have no "pigmy equipment."

Attitude of Miners' Union

Speaking of the attitude of the miners' union in Great Britain, the article defines it as "false political economy," which reference I fail to understand. If the miners claimed an advance in proportion to the selling price and because of the high cost of living, in my opinion it was justified. Welsh coal has been sold at $4.80 to $5.28 per ton during the last five years, and the highest price paid for mining will hardly reach 75c. per ton. Coal operators, in this country, would be glad of such a margin.

Reference is also made to the mines of Great Britain as being "extremely warm and enervating." But this is the effect of natural conditions. I have seen gobs in these mines so warm that one could not hold his hand on the stone, and an air current of 20,000 cu.ft. per min. was passing the place. All of these conditions must be considered when comparing coal mining in Great Britain with that in this country. William James.

Mystic, Iowa.

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Fluctuation in Price of Coal for Different Grades

Referring to the editorial entitled, "Why Different Grades of Coal Fluctuate Independently," *Coal Age,* Nov. 27, p. 890, I desire to draw attention to the third paragraph of the article, in which it is stated that the demand for the small sizes of anthracite depends only on "past use and the type of boiler-furnace grates already installed."

This statement would make it appear that if a concern has a boiler plant so equipped as to burn small anthracite, it does not care to change and use soft coal merely because its boilers are so equipped. This seems hardly to be the case. If there are sufficient advantages for changing over from small anthracite to soft coal, merely the fact that the boilers are equipped to burn hard coal will not deter many from making such a change, especially since it would not be very expensive to equip their boilers to burn the soft coal instead. It is no uncommon occurrence for a concern to remove grates that have been in use but a short time in order to replace them with proper grates and blowers to burn small anthracite and so effect the resulting economy.

Surely "past use" does not incline a concern to continue to burn small anthracite unless other valid and weighty reasons exist. There are today thousands of concerns burning small anthracite, and they are doing so in possibly 99 per cent. of the cases because they find it economical, not because they had been doing so in the past. Is it not a fact that the use of small anthracite has been increasing and not decreasing? That certainly would not be the case if it were merely "past use" that is causing plants to continue its use.

The Question of Confidence

Again, the editorial states that "once the trick is turned he (the plant owner) will feel a confidence that will make it difficult for the hard-coal salesman thereafter to reconvert him to the use of an anthracite fuel." Why? Why does the use of soft coal necessarily insure this "confidence"? There are plants operating today in all sizes from 100 hp. up into the thousands and burning small anthracite. They do not lack confidence in any degree, nor is there any reason why they should.

This paragraph in the article would almost seem to be a brief for soft coal, though I am sure that you had no such intention in writing it. Nevertheless the article is distincly unfavorable, not only to anthracite mine operators and coal companies, but also to all concerns whose business is more or less directly affected by the sale of anthracite. Surely you do not, on second consideration, believe such a statement as the following, which I quote from this article: "Such customers once lost might not be regained even if the price of the anthracite fuel were much reduced." There are not a few concerns that used anthracite and changed over to soft coal, but have again come back to hard coal, even without a price reduction. There are no doubt others that have changed to soft coal because of changes in price who would gladly and immediately go back to hard coal if the price of the latter were again reduced.

I shall be glad to have your further comments on this matter, if you feel that this is warranted.

New York City. V. H. Carples.

* * *

Responsibility of Miners

Letter No. 4—I was much impressed in the reading of Letter No. 2 by John Majer, *Coal Age,* Nov. 13, p. 814. I can heartily indorse all that he has said on the subject of the responsibility that rests with the miner when he goes into the mine.

Mr. Majer remarks, "Miners suffer more as a result of these enforced periods of idleness than the coal operators themselves." That statement is too true; there are thousands of miners throughout this and other states who can testify to that fact from their own experience. When the mines shut down last spring, many miners had to hunt work elsewhere, and some of them are still looking for places. Many have left the union fields of Ohio and have gone to the nonunion fields of West Virginia and Kentucky in the hope of finding employment that will give their families the necessaries of life.

Speaking of miners suffering in periods of idleness more than the mine operators calls to mind a little incident that happened the other night. We had just finished supper when there came a knock at the door. A man stood outside asking for something to eat. While my wife was preparing it, in response to my question he said that he came from Ohio, where he had worked for the Sunday Creek Co. until the big strike that closed the mines. He said that he had a wife and five children, and when the miners' aid ceased, he was obliged to hunt for work elsewhere. Now, with winter approaching, he had no job, no clothes and perhaps his wife and children were starving at home.

I took the man to the mine manager (foreman), who opened his heart and promised to start him to work in the morning. The man looked like a good miner, and I believe he will stick to his work. This incident, which is but one in many, shows clearly who suffer the most by such periods of idleness for which the miner, as an individual, is in no way responsible.

Miners Take Chances Needlessly

The miner is responsible, however, for his conduct in the mine. I believe every man in a measure is as responsible for the safety of his fellow worker as for the care and protection of his own family. As a class, miners are reckless men who take many chances when there is no need of their so doing. I have heard it argued that it is useless to attempt to stop these reckless habits, but in my opinion they can be stopped by giving these men a broader education relating to work and conditions in the mine. It may be a slow process, but eventually every miner will come to realize the danger of crossing over an examiner's (fireboss') mark or failing to set a post under a loose rock, and many similar things that today the miner chances. I hope this discussion will continue until some good is accomplished and every miner is impressed with his individual responsibility.

Eldorado, Ill. Ostel Bullock.

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Store Checks vs. Thrift

Letter No. 8—I have been reading with great interest the letters relating to the store-check system. It is all very well for the industrious miner who cares for his wife and little ones to say that he has no use for the store-check system in company stores. Why? Because he has a few dollars laid away that he can use in time of need.

There is another side to this question, however, as we have a different class of miners to deal with and they are not few in number. I refer to the man who spends at least one week's pay on pay night, perhaps all his pay, and what is left for his wife is a brutal answer or a kick.

A Personal Experience

My own experience, briefly told, may serve to emphasize my claim that the store-check system is the only proper method of conducting a company store today. I am a miner 31 years old and have worked 21 years in the mines. Why? Because my father worked in the mine and brought me up to do the same. I am sorry to say that my father drew his pay in cash every payday and spent practically all his earnings instead of bringing the money home. The first payment was always made to the saloon, as father regarded this the most important. There might be two or three saloons, but all must have their pay on pay night, which was ended in a drunk. This would be followed the next day by many friends eager to drink the health of any man with a few coins in his pocket. Then came the sad story of who is to pay the store bill and the butcher, and this burden fell heavily on the wife and mother.

I recall that many a time mother would say, "Fred, you will have to wait this time for your shoes, the store must be paid." Is it strange that this experience compels me to say that the store-check system, with all its faults, is far better than the cash system, as it protects the wife and mother of a family and permits her to obtain the necessities of life, while at the same time it brings the drunken miner to his senses. The wife can go to the store, buy what goods she needs on the store-check system, and the husband gets a blank on payday. While the system thus gives the needed protection where it is necessary, it imposes no burden on the man who trusts and is trusted by his wife and family.

Practical Working of Store-Check System

To conclude this unhappy recital and clinch my argument, permit me to say that since being married, I have worked in a different mine and can buy at three different stores. The mine in which my father now works, I am glad to say, has a company store—one of the leading stores in town. On payday he draws a blank and as a result is in bed at 8 o'clock every pay night. If he is to get a glass of beer, he must beg the nickel from mother. I will say that the company store has saved my father, who would have been dead years ago but for the store-check system. If mother wants a pair of shoes, she can get them at the store. She has not been able to put much money in the bank, but it is great to know that the butcher and the store bills are paid regularly.

In closing, I want to say that the store-check system is a godsend to many miners' wives. Instead of doing away with this system, take away the saloons, and miners will have a better chance to make good. H.

——, Penn.

Letter No. 9—The discussion of the question of store checks versus thrift, growing out of the Foreword in *Coal Age*, Oct. 16, increases in interest. In answering the question whether the company store-check system is an evil and operates against thrift in the miner or whether it is a help to him in some instances, I speak from the standpoint of my own experience and observation as a miner.

My opinion is that it is an evil only to that class of miners who have misused the privilege, but to the average miner it has been helpful. The lack of forethought and of the exercise of economy and frugality in his own affairs is a greater obstruction to thrift in the miner than the store-check system. My observation has convinced me that the miner who objects to that system most is generally the one who, by reckless and improvident living, is forced to trade wholly at the company store because he cannot get credit at other stores and never has any money.

Extravagance Among Miners

I have known miners who made more than a hundred dollars a month and yet, with average families only, never drew a dollar in cash on payday, having exhausted all their wages in store checks. I have known other miners working in the same mine and earning the same amount, with about the same families to support, who used no store checks, but drew the cash payday. Before the next payday came around, however, the money was all gone, and there was nothing to show for it. It may be argued that these are extreme cases, but they are to be found nevertheless. Unfortunately miners of this class seem to have been born improvident. They have no management or forethought in regard to their financial affairs. They save no more money and apparently have no more comforts when earning a hundred dollars a month than when earning half that sum.

From the standpoint of thrift neither of these classes of miners seems to have the advantage of the other. But surely the reckless and injudicious management of the latter class cannot be attributed in any way to the store-check system. I have known other miners who managed their work poorly in the mines and could not make above fifty or sixty dollars a month, but who drew what store checks they needed, lived frugally and saved money enough to buy homes. Store checks did not operate against these miners. The miner who is thoughtful and economizing in his affairs, however, is not always the best and most reliable worker, as has been intimated. Some thriftless miners are willing and hard workers and always ready to go where needed. Many of them have good judgment about work and consequently make more money under the same conditions than the miner with more thrift, but they do not have the same ability to use their earnings to advantage.

Thrift Means Responsibility

The question has been asked, "Isn't thrift worth more than store checks?" Certainly it is, wherever it can be taught. But there are miners who have been in the mines for years and still have no conception of thrift or economy and seemingly never will have. They do not want thrift, for the reason that it carries with it the responsibility of thought, purpose and management.

For illustration: The general manager of a company where I once worked built for one of his employees a nice three-room house, which was to be paid for by the month at about the rate of the rent. When the amount was about half paid, this employee wanted the general manager to take back the house and return him the money paid, which, of course, the general manager would not do, but encouraged and insisted on his finishing payment and having a home of his own. The employee finally made all his payments and received a deed to the property. He then sold it for less than cost and quit work until the money was all gone and he was back where he was before. Several years have passed since this incident occurred and this man is without a home or a dollar in his pocket. Like many others he does not want to be burdened with owning a home.

In conclusion I will say that in my opinion the store-check system and the average company store, as conducted in this mining section, are not evils working against either the thrifty or the improvident miner. For illustration: Owing to the dull demand for coal, together with close competition and disadvantages in transportation facilities, many mines have not been operated steadily during the past months. And many of these, even when operated in connection with a store, have yielded only small profits, if any. Many would not have been operated at all but for the store. Working in many instances less than half time, many miners were compelled to spend in the store all they made. Without this half-time work, which they would not have had but for the store assisting the mine and with nowhere to go to better their condition, may I ask, Is not the company store more a blessing to the miner than an evil? Ask the thoughtful, industrious miner for his opinion in regard to the store and the store-check system.

JOHN ROSE,
Dayton, Tenn. Former District Mine Inspector.

A Flooded-Mine Proposition

Letter No. 4—Referring to the inquiry relating to the flooding of a mine as described and illustrated on page 646 of *Coal Age,* Oct. 16, I want to suggest the following procedure:

Advance the pumps with the unwatering of the places to near the face of room No. 4, where the machine cut through into the old workings. This will reduce the actual suction length or the distance the pumps must draw water. When the water has been sufficiently reduced pile sacks of sand along the face and in the undercut, close up to the machine, so as to cut off the flow of water as much as possible. Now, having extra sacks of sand ready and all preparations being made, quickly pull the machine back and block the opening with sand bags to stop the flow of water as much as possible. Most of this work, of course, must be done in the water accumulated at the face.

Then, proceed to build a dam of sand bags about 5 ft. back from the face, forming a semicircle about the cut, and build this, say a foot or 18 in. in height. Make the dam tight by plugging the inner faces of the bags with clay. When this is completed, it will be possible to construct a permanent bulkhead across room No. 4 about in line with the face of room No. 5. I think it will be safe to erect the bulkhead at this point, since practically 5½ ft. of barrier coal held back the body of water previous to the machine cutting through the pillar. Shallow trenches should be cut in the roof and the floor, of the same width or thickness as the bulkhead and extending across room No. 4, also in the ribs on each side, so as to form a good bearing for the bulkhead. The bottom will perhaps require the most careful attention, owing to its being softened by the action of the water, and this bottom trench should be deep enough to reach solid formation.

From the statement of the question, I do not believe that the head of water, in this case, is 100 ft. The inquiry states that the inflow of water ranges from 700 to 800 gal. per min. Say it is 748 gal. or 100 cu.ft. per min. Assuming that the hole broken through is 3x4 in. or, say, $\frac{1}{12}$ of a square foot, if the flow is 100 cu.ft. per min., the velocity of the water will be 1200 ft. per min. or 20 ft. per sec., which would show the head to be

$$v = \sqrt{2gh} = 8\sqrt{h}$$

and

$$h = \left(\frac{v}{8}\right)^2 = \left(\frac{20}{8}\right)^2 = 2.5^2 = 6.25\ ft.$$

In other words, the abandoned workings are, perhaps, filled with water over a considerable area, but the water probably has a comparatively small head. It is possible to calculate, under these conditions, the exact pressure of the water on a bulkhead or dam constructed at the face of room No. 4; but this will hardly be necessary in the present case. I would suggest the building of a reinforced concrete dam or bulkhead across the face of room No. 4 as previously stated. I estimate the horizontal pressure against a section of this dam 1 ft. wide and, say, 6¼ ft. high, under the estimated head, to be 1,218 lb.

The Pocket Companion of the Carnegie Steel Co. gives, for this pressure and a span of 4.5 ft., a slab 6 in. thick containing an area of steel reinforcement of 0.18 sq.in. per ft. of width. In triangle mesh, style No. 41, consisting of $\frac{7}{16}$-in. cold-twisted square bars, one every foot of width will be sufficient. Then allowing a factor of safety of 5 to cover unknown conditions, the slab or bulkhead in this case should be 10 in. thick, with 0.7 sq.in. of steel area reinforcement. This would require $\frac{13}{16}$-in. cold-twisted square bars, placed 1½ in. from the outer face of the dam and one bar per foot of width.

A. W. HESSE, General Manager,
Lincoln Coal Mining Corporation.
Big Creek, W. Va.

The Coal Age Pocket Book

There has been such a demand for the early publication in book form of the pages that have appeared in *Coal Age* each week under the title, "Study Course in Coal Mining," and so many inquiries have been received in regard to the ultimate scope of the work that it has been decided to issue in January, 1916, three sections of the book, which will be known as "The Coal Age Pocket Book."

The matter has been prepared by J. T. Beard, of the *Coal Age* staff of editors, and is not a compilation of other publications, the subjects being treated originally and independently with a view to eliminating extraneous matter and presenting in a simple, concise form only what is essential in the study of the subjects relating to coal mining.

One of the prominent features throughout the book is the unification of standards and constants commonly used in engineering, the derivation of which is shown, as far as practicable, for the assistance of those who desire to study the rudiments of each subject treated. The book is written as an aid to study and combines matter needful for the beginner and valuable to the engineer.

The present publication will include sections on arithmetic and mensuration, including logarithms, geometry and trigonometry, mine gases and ventilation. The pages in each section will be numbered independently to permit extension in later editions as each subject is amplified. It is a book that even in its present incomplete form will prove a helpful companion to every mine manager, superintendent, foreman, assistant foreman and fireboss—a valuable reference book for engineers and a simple and instructive textbook for beginners.

Inquiries of General Interest

Coal Salesmanship

As one interested in the sale of coal, I would like to ask, What should constitute the actual ability of a man employed in the sales department of a large coal company? In other words, what must be the qualifications of a man able to sell coal; what must he know?

Is this knowledge to be obtained from books or from experience in the actual mining of coal? Are there any books published on this subject that would help me? I am getting my experience underground, but hope some day to get into the sales department, and I desire to fit myself in every way possible for the work that will be required. R. J. Lauder.

Emeigh, Penn.

A good salesman in any branch of industry must be possessed of many qualifications. It is important that he should know thoroughly the article he has to sell. This knowledge must include not only the qualities of the article or substance, its source of production, details of handling, storage and manufacture, but also its application to practice and adaptation to different conditions with respect to the purpose for which it is intended. He must be well informed of its present market value and the competition that must be met and overcome in its sale.

Aside from this knowledge, a salesman must have a good address. He must be a fair judge of human nature, optimistic and not easily discouraged. He must use judgment in approaching a customer and display tact in announcing his errand and presenting his business. A man cannot sell to advantage an article with which he is not fully acquainted; but even with this knowledge, his success in securing a good order will depend largely on his knowledge of men and the judgment and tact he displays in the transaction.

A good salesman will recognize that there are times when it is more important to win the esteem and confidence of the man he approaches than to sell him a bill of goods or take his order for a car of coal. He must know the need and be quick to detect the varying inclination of his customer, humor his whims and be interested in his hobby if he has one. By such tactics, an ingenuous salesman will often secure an order where more direct methods would fail. A good salesman, however, will not lead a customer by such methods to order goods he does not need, as the results that are likely to follow will prove as disastrous to the one as to the other of the two parties.

In regard to the preparation for salesmanship, we recommend a practical apprenticeship, which alone can give the necessary experience that will make a successful salesman. Study every feature of the industry. To sell coal, one should know by experience every detail connected with the mining, haulage and loading of the coal at the mine and its transportation to market. Most of this knowledge must be gained underground. He should then become thoroughly acquainted with the business methods in the office of the sales department.

Much can be gained by the study of means and methods, as described from time to time in *System*, A. W. Shaw, publisher, Chicago, Ill. A salesman can secure many good points in respect to advertising features that cannot but be helpful to him by reading the small weekly publication known as *Printers' Ink*, published at 12 West 31st St., New York City.

In the preparation for salesmanship there is much helpful information to be obtained from a book entitled "The Art of Selling," by Arthur Frederick Sheldon. The book is published by the Sheldon University Press, Libertyville, Ill., price $1.25. Another book entitled "Scientific Sales Management," by Charles W. Hoyt, price $2, gives some valuable information in the management of sales departments.

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Tripping of a Circuit Breaker

I would greatly appreciate an explanation of the following trouble: In our mine, when a short-circuit is caused by locomotives or mining machines, it knocks the circuit breaker at the pump motor, should this be running at the time. The result is a big flash, and the commutator of the motor is blistered. At the same time, the circuit breaker in the power plant is tripped, causing a big flash and blistering the commutator of the dynamo. N. Johns.

Beccaria, Penn.

When a short-circuit occurs on a power line, whether this is owing to the haulage locomotives, mining machines or other cause, the result is a drop of voltage over the entire line, owing to the greater rush of current caused by the short-circuit. There may be two cases to be considered: (1) The circuit breaker may be equipped only with an overload release. (2) The circuit breaker may be equipped with a low-voltage release. In the first case, when the short-circuit occurs, resulting in a great rush of current and a drop of voltage, there is produced sparking at the commutator or a big flash accompanied, it may be, by the "pitting" of the commutator. This is not, properly speaking, a "blister," as described by the correspondent, although it may somewhat resemble it in appearance. The sparking or flash is at once followed by the tripping of the circuit breaker.

The same series of events takes place at the pump motor. There is a big flash accompanied by the sparking or pitting of the commutator and the tripping of the circuit breaker simultaneously with the occurrence in the power plant.

This result should not occur, however, if the circuit breakers are equipped with a low-voltage release. In that case, when the short-circuit occurs on the line, the drop of voltage that immediately follows will trip the circuit breakers and prevent the rush of current that would otherwise damage the commutators.

Examination Questions

Tennessee Examination Held at Knoxville, Nov. 23-25, 1915

(Selected Questions)

Ques.—Why is the dust from some coals more dangerous than others?

Ans.—Because of its greater fineness and inflammability, owing to the physical character of the coal and its chemical composition. The fineness of the dust marks the ease with which it is held in suspension in the mine air, in which condition it is more readily acted upon by the flame of a shot or burning gas. Again, some coals contain more bituminous matter and volatile combustible, which render them more highly inflammable than a coal containing less of these constituents. Also, some coals absorb a larger amount of oxygen from the atmosphere, which increases their inflammability.

Ques.—Where are explosions from coal dust most likely to occur?

Ans.—Explosions of coal dust are more likely to originate in proximity to the coal face, especially where mining machines are employed to cut the coal. The reason for this is the greater accumulation of fine dust and the greater emission of gas from the freshly cut coal at the face, in addition to the presence of flame incident to blasting the coal or the possible occurrence of a blownout shot. All these conditions are important features in the origin of a dust explosion.

Ques.—What are the chief factors of danger in coal mines?

Ans.—The chief factors of danger in the operation of coal mines are the liability of injury from falling roof or coal, the ignition of gas or dust, movement of cars, shock from electric wires, the possibility of being overcome by breathing gas or air devoid of sufficient oxygen for the support of life.

Ques.—How does carbonic-acid gas (carbon dioxide) affect the human system?

Ans.—Carbon dioxide is not commonly considered a poisonous gas, but it has nevertheless a distinct toxic effect on the system that is extremely dangerous. The presence of this gas in the air breathed not only reduces the percentage of oxygen below the normal, but its absorption by the blood seriously interferes with the power or capacity of the blood to absorb and carry out of the system the carbon dioxide produced in the tissues of the body as a result of the oxygen conveyed to them by the blood.

It must be remembered that the blood performs a double function—conveying the oxygen breathed into the lungs to the tissues of the body, and removing therefrom the carbon dioxide produced by the combustion going on throughout the body. The effect of carbon dioxide in the air breathed is therefore to derange the human system, first causing headache, then pains in the back and limbs, followed by nausea, prostration and finally death by suffocation when a sufficient portion of this gas is present in the air.

Ques.—How would you ascertain the number of cubic feet of gas standing in an entry?

Ans.—This question must be answered from the standpoint of mining practice rather than in its literal sense. Gas generated at the head of an entry, a few feet in advance of the last breakthrough or crosscut where the air current is passing, has a tendency to accumulate in greater or less proportion at the face of the entry. The percentage of gas in the mine air under these conditions diminishes gradually from the roof to the floor and from the face of the coal outby to the crosscut.

In mining practice what is called "gas" is such a percentage of marsh gas present in the air as will form a cap on the flame of a lamp used for testing. It is customary, therefore, to raise the lamp cautiously toward the roof and note the point at which the cap first appears on the flame of the lamp. If this occurs at 6, 8 or 10 in. from the roof, there is said to be 6, 8 or 10 in. of gas. It may be possible to approach and measure the gas nearer the face of the entry, but as a rule the movement of the person toward the face will disturb the gas so that it is practically impossible to measure with any accuracy the so-called volume of gas accumulated in the entry. The miner, however, reports so many inches of gas, and its volume is estimated by multiplying this number of inches by the width of the entry and that product by the distance from the face to where the gas is found or measured, and reducing this volume to cubic feet.

Ques.—What sources contribute to the heavy loss of coal in mines?

Ans.—The causes of loss of coal in mining are numerous. Probably the lack of a definite plan in the laying out of the mine is the primary cause of the greatest loss of coal in the later development. The failure to adopt a sufficient width of pillar on the main and cross entries and to proportion the width of room pillars to the size of opening, depth of cover, nature of roof, floor and coal, thickness and inclination of the seam, etc., causes great loss in working the coal. The tendency of miners to rob the pillars in the first working causes the loss of much pillar coal when bringing back the pillars. The irregular working of the rooms along a single entry results in some rooms advancing more rapidly than others, which produces a broken line at the face of the coal and brings undue pressure on some of the room pillars, crushing them and increasing the loss of coal in drawing back the pillars.

Ques.—If 15,000 cu.ft. of air and gas at its highest explosive point is passing through a mine what is the quantity of gas given off? What quantity of air must be added to render this current nonexplosive?

Ans.—A mixture of air and marsh gas at its highest explosive point contains 9.46 per cent. of gas; hence the volume of gas given off is $15,000 \times 0.0946 = 1,419$ cu.ft. per min. The volume of air and gas when this is, say a 2-per cent. mixture is $1,419 \div 0.02 = 70,950$ cu.ft. and the volume of air to be added is therefore $70,950 - 15,000 = 55,950$ cu.ft. per min.

Book Reviews

Text Book on Assaying

A TEXTBOOK OF PRACTICAL ASSAYING FOR THE USE OF MINING SCHOOLS, MINERS AND METALLURGISTS. By James Park, professor of mining, Otago Universiity, director of the Otago University School of Mines, New Zealand. Revised from 3rd New Zealand edition. J. B. Lippincott Co., Philadelphia, Penn. Cloth, 5¾x7¾ in. pp. xii + 335 + 7 index, 17 illus.

A reliable, but elementary, book on the subject of analyses of all kinds including even soils, manures, oil shales, alcohol, sugar and milk. There are 18 pages on the proximate analyses of coal, its calorimetric measurement and the determinations of sulphur and phosphorus. The chemist is supposed to obtain results comparable with his fellows, and it is best therefore for an American to follow recognized American methods. The moisture and volatile matter in coal as determined by analysis are not absolutely definite quantities, but will vary a little with different methods of determination. It is best therefore to follow arbitrary practices in common with other American analysts and not to imitate the methods of foreign assayers until those methods are adopted by other American authorities. If real accuracy is sought, then methods must be adopted such as are described in the report of the Committee on Coal Analysis of the American Society of Testing Materials and the American Chemical Society.

Following an English custom which perhaps dates back to a time when the whole truth of the matter was not apprehended, the author designates as "volatile hydrocarbons" what in America we term "volatile matter." H. C. Porter, of the United States Bureau of Mines, recently stated: "From some bituminous coals, completely dried, we obtain by decomposition as much as 10 per cent. of noncombustible volatile matter and from some lower-grade coals even as much as 15 or 18 per cent. So there can be no question that the term 'volatile combustible matter' as frequently used is decidedly a misnomer." The term "volatile hydrocarbon" makes this same false assumption and regards the product of "distillation" of coal as consisting entirely of compounds of hydrogen and carbon, whereas water is invariably present.

* * *

An Elementary Text Book

AN INTRODUCTION TO MINING SCIENCE. By J. B. Coppock, associate of Nottingham University College, and G. A. Lodge, lecturer on mining and mine surveying at Huddersfield Technical College and Batley Technical School. Cloth boards; 4⅞x7 in.; pp. x + 226 + 4 index. 102 illus. Longmans, Green & Co., Fourth Ave. and Thirtieth St., New York City. (Longmans Technical Handicraft series.) 60c., net.

There have been a large number of books published purporting to give just the information needed to secure a mine foreman's certificate—just that and no more. Sometimes questions from actual examinations are given with their answers, so that the reader is assured that he is wasting no time in the studying of matters which are not necessary. Like the foreigner, posted by the astute politician and preparing to attest to the judge that he is fit for citizenship, the would-be mine foreman is prepared for the ordeal of examination by such books as those just described. With such an irreducible minimum, with such cramming without thought, what wonder is it that the students so often fail to pass! They forget what they have been told and do not have the power to reason for themselves.

Cramming May Suit the Pupil, But Not the Industry

Perhaps, however, cramming is all right for the man who wants the certificate, but certainly not for the man who would hire the certificated man. The company which deliberately starts a school to cram scholars for mine foremen is riding to a fall. A company school should give the broadest kind of instruction, and then if a man passes his examination he is sure not to have merely a minimum qualification of knowledge, but an abundance of needful fact and a logical basis of reasoning. After all, the mine foreman's certificate is not the end-all and be-all of mining education as some believe.

This little book—always elementary, always thoughtful and (what is more) always correct—leads carefully from the known fact to the unknown and draws from the pupil a thoughtful consideration of the laws of nature in their relation to mining. However, the experiments described are many, and a certain amount of paraphernalia is necessary to demonstrate the course to the students. But surely every company can afford the small amount of chemicals, the bell jars and flasks which the authors require.

The subjects treated are: Combustible and Incombustible Substances; Air, Its Constituents and Its Actions; Air Currents and How They Are Caused; Increase in Size of Substances by Heat and Its Applications; Principle of the Safety Lamp; Mine Gases Known as Damps; Substances Which, Mixed with Air, Form Explosive Mixtures; Flames, Their Shapes and Parts; Ways of Producing Heat and Light; Inflammability of Substances; Substances Containing Fixed Oxygen; Diffusion or Movement of Gas Particles; Substances and Their Changes; Coal, Its Nature and Origin.

Both Miner and Mine Foreman Need Training

Every opportunity is taken to point the relation of the scientific facts established to the needs of the mining man. The training given here is such that it will be a pleasure rather than a burden when the day's work is done, and it is likely to form the matter of conversation between the pupils.

But the book gives no mathematical discussion of mine gas, ventilation or haulage, and of course the mining law is not touched. It is an introduction and only an introduction to mining science. Nevertheless it is such a pleasant pathway to the study of mining that even those who are not thrilled with the hope of attaining the dignity of mine foreman will desire to know what it has to teach and will find it of use to them in their daily vocations. And after all we waste too much effort on making mine foremen. There are other men who need to know something about the tools they use and the dangers they face and the laws natural and arbitrary by which they are governed. These also will be appealed to by these interesting lessons.

* * *

A Cambria County Coal Map

MAP OF CAMBRIA COUNTY, PENNSYLVANIA, SHOWING MINES, COAL AREAS, BASINS, RAILROADS, TOWNSHIPS AND COAL-MINING STATISTICS. By Andrew B. Crichton, civil and mining engineer, Johnstown, Penn. Map 36x39-in. Key sheet 16x32 in. Price, $2.

This map of wall size will be found of much benefit to all who have interests in Cambria County. It gives the locations of all the mines, towns, township roads, streams, township boundaries, anticlines, synclines and reservoirs. The key sheet, or supplement, shows the 212 mines, their names, operating companies, the addresses of the same, their general superintendents, their addresses, the number of employees, the seam worked, its thickness, the kind of opening, the shipping railroad, average daily output in 1912, in 1913 and in 1914, the inspection district and other annotations.

Cambria County coal was first used in 1822, yet in 1840 only 41 men were employed in the county. But in 1914, 25,787 men were working at its mines and producing 16,571,359 tons. In the year before there were 23,277 men and the tonnage was 19,265,395. The year 1914 was a distinctly unfortunate year for the miners of Cambria County, only 206 days being worked as against 268 in the year before.

All the coal in Cambria County is low-volatile in character because by far the greater part of the county lies southeast of the Laurel Ridge, or first anticlinal. Much of the coal lies well under cover, and when this is worked, as it certainly will be because of its excellent qualiity, Cambria County will put out a much larger tonnage even than today. In the whole county there are only 17 shaft operations and 44 slope mines, the other 151 operations being by drift. Of all the mines, 1 is in the A bed, 85 are in B, 3 in the rider of B, 3 in C, 36 in C', 44 in D, 39 in E and 2 are unknown. It is evident that the B bed takes the lead, and this is largely because of its excellent quality. The D bed is often sulphury in that county, while the C', which in most of the counties of Pennsylvania is a worthless, completely negligible bed, in Cambria is a seam of remarkable value. The leadership of Cambria County as a coal producer is derived from its comparative nearness to the Eastern market and the excellence of the fuel mined.

Coal and Coke News

Washington, D. C.

In his annual report just sent to Congress, the Secretary of the Interior has given a thorough review of the work of the Bureau of Mines for the past year, as well as an outline of the Alaska situation, with reference to coal mining. The report furnishes much hitherto unpublished information regarding the operation and problems of the Bureau.

With reference to the Alaska situation the report says:

Coal Areas—Surveys of the coal areas in Alaska, in the Bering River, Matanuska and Uenana regions, together with classifications of the coal lands and reconnaissances of certain areas for reservation for the use of the Government, as provided by act of Congress, were begun during the past summer. Tests of the Matanuska coal for steaming purposes were made during the year under the direction of the Navy Department, and the coal was found eminently satisfactory. The coal now consumed in the Territory continues to be imported, a considerable portion of which comes from British Columbia. A decrease in the consumption of coal is noted, due to the greatly increased use of fuel oil in the Territory. Three patents of coal lands were issued during the fiscal year. The importation of coal into Alaska from the States and from foreign countries during the last fiscal year amounted to 79,239 tons, valued at $397,290. Of this 32,927 tons, valued at $141,480, was foreign coal, and 46,312 tons domestic, valued at $255,810.

HARRISBURG, PENN.

Despite the fact that both the anthracite coal carrying roads of this state and the coal operators as well asked for a rehearing with reference to the rates for "cereal" sizes of coal, fixed last June, the Interstate Commerce Commission on Dec. 6, decided not to grant such a rehearing.

The present rates will stand. The commission made no comment in denying the petition for a rehearing, but evidently takes the position that nothing has been presented to warrant a rehearing or a revision of the existing rates.

The so-called "cereal" sizes of hard coal, including rice, barley and buckwheat, are being shipped under the schedule of rates fixed by the commission some months ago. There was a hearing on the petition of the coal operators from the state for lower rates last summer and concessions were granted by the commission, the various rates being lowered, but not as much as the operators desired.

The coal operators and the railroads both petitioned for a rehearing, the one side asking an opportunity to show that still lower rates would be justifiable and the other seeking to show that present rates were unprofitable and that higher rates should be restored.

It was decided that there should be no reopening of the anthracite coal cases. Although the railroads claim that they are carrying the coal at rates that are unprofitable, this decision makes it certain that they must continue to carry the sizes of coal that have been under consideration at the rate now in effect.

Is There To Be Discrimination

The State Compensation Board on Dec. 9, adopted a ruling which will require employers seeking exemption from the necessity of insuring their compensation liability to declare whether they will discriminate against a married employee or one with a large family in favor of an unmarried employee or one with a small family. A ruling was also adopted that the board will require a statement whether discrimination will be made against an American in favor of an alien employee and whether any discrimination will be made against a man on account of his age when he is otherwise qualified.

The Attorney General on Dec. 10, gave an opinion holding that the State Treasurer is custodian of the compensation insurance fund and receipts issued by him for payment made for the use of the fund do not have to be countersigned by the Auditor General; that the bonds shall be made to him as State Treasurer and not to the Commonwealth, and that the State Treasurer may designate the depositories for the fund from the list of banks approved for deposit of state money.

Underwriting of Liability Insurance has Begun

Underwriting of compensation insurance covering the liability of employers subject to the workmen's compensation act of 1915, began in all sections on Dec. 13. The statewide activity in liability insurance will follow by the announcement of the State Workmen's Insurance Board of the rates approved by the Insurance Department.

The approved rates which must be observed by the authorized stock and mutual companies are based on each $100 of annual pay roll, and must be applied only for coverage of compensation liability. The state insurance fund is allowed a 10 per cent. deduction under the rates as approved for stock companies.

The manual to be issued containing the approved rates will be the first to be issued in this state, and will contain a number of rulings regulating the writing of compensation insurance.

Rates on coal mining have not been approved by the Insurance Department. Additional data on the hazard in coal mining is being collected and compiled and these rates will probably be available for distribution about Dec. 22.

Principal operation is the governing classification of its risk. Sub-division will not be permitted, unless separate and distinct enterprises are conducted by the same employer without interchange of labor.

Exceptions are made for executive officers, clerical and office employees, salesmen, collectors and messengers, draftsmen, chaffeurs and chaffeur's helpers.

The minimum premium that will be charged by stock companies and mutual companies is $10, except on contractors risks for which it is $20. Blasting operations require an additional minimum of $25.

Francis H. Bohlen, counsel for the Workmen's Compensation Board, on Dec. 13, submitted an opinion declaring that an employee who has accepted the provisions of the workmen's compensation act cannot bring suit at common law against his employer for a work accident resulting in the mutilation of the employee.

A suit now pending in the Court of Appeals in New York State, in which an employee whose ear was mutilated by a horse he was employed to drive, seeks to recover damages from his employer, is regarded by Mr. Bohlen, at not "even persuasive authority in support of the right of an employee similarly injured to maintain a common law accident in this Commonwealth."

Mr. Bohlen points out that under the Pennsylvania act the employee voluntarily accepts the compensation provisions, while in New York he has now power to reject them. Mr. Bohlen further states that the difference in wording of the Pennsylvania act and the New York compensation act would prevent the decision of the New York Appellate Court even if affirmed by the Court of Appeals, from being applicable in determining the right of an employee under the compensation act.

In discussing the status of the employee under the Pennsylvania law, he says: "The employee agrees to give up his common law rights to recover damages for any personal injury due to a work accident and all the harmful consequence which he suffers therefrom and in return receives a right to the compensation provided in the article. He and his family obtain a certainty of a speedy and fixed compensation whenever he is disabled or killed, in place of his previous right to full damages on the comparatively rarely-occurring occasions when he could prove that the accident was due to his employer's negligence. In return he gives up not only his right to full damages for those harms for which compensation is provided, but also all right to any compensation or damages for those infrequent harmful consequences such as mutilation and disfigurements which do not entail loss of earning power and so are not the subject of compensation. It is therefore clear that the sole remedy of any employee who has agreed to accept the compensation provisions of article 3 is under that article and that he can maintain no action at common law for any harm resulting from a work accident whether covered by the compensation schedules or not. There is therefore no right of action at law to recover damages for mutilation or disfigurement not causing disability for more than 14 days. An employee so mutilated is only entitled to the medical, surgical and hospital services which the employer is required by section 306 to supply him and if these are refused and he is forced to provide for himself, his sole remedy is by petition to the Workmen's Compensation Board under section 412 of the Compensation act.

PENNSYLVANIA

Anthracite

Tamaqua—Car shortage due to embargoes and increased freight shipments of other than coal, is causing a serious curtailment in the production this month. Fourteen of the 16 Lehigh Valley Coal Co.'s collieries in the Mahanoy region were compelled to go on short time recently because of car shortage.

Mauch Chunk—During the past week the Lehigh Coal and Navigation Co. has experienced considerable difficulty in securing an ample supply of labor with which to continue the extensive stripping operations which it has under way in various parts of this county.

Duryea—Independent operators who purchased the Bowkley tract of land in this section are making preparations to mine the coal. Drifts have been driven at a point west of Main street and a short distance south of the Lehigh Valley Coal Co.'s Seneca colliery, toward Main street, where the Checker vein is located. The coal will be prepared at the Seneca Colliery which is only a short distance away.

Shenandoah—Many collieries in the Shenandoah Valley were compelled to suspend all operations one day last week for want of railway cars. Thousands of men were made idle.

Jessup—The Dolph Coal Co.'s breaker and boiler houses, one of the best equipped in the Lackawanna Valley, burned on Dec. 11, entailing a loss of $150,000 and throwing 800 men and boys out of work. The breaker was comparatively new, replacing one burned a few years ago. This is the third coal breaker burned in this section within two months.

Dupont—The two public schools of this town, were closed on Dec. 8, on account of surface subsidence. Several homes in the immediate vicinity of the schools were also affected. The cave is believed to be due to disturbances in the workings of No. 2 Heidelberg Colliery. The foundations of the buildings were cracked and the plaster shaken down and the structures thrown out of plumb. One of the buildings is practically a wreck.

Plymouth—The compressor pipe line at Lance No. 11 Colliery of the Lehigh & Wilkes-Barre Coal Co., burst on Dec. 9, and for a time consternation reigned. The pipe line leads down the shaft to the air locomotives and pumps and was carrying a pressure of 850 lb. A length of pipe with an elbow attached was blown across the street, tearing down the fences, poles, telephone and street railway wires. The force of the concussion was so great that the report was heard a mile away and many feared that an interior explosion had occurred.

Laurel Run—The fire which had been raging in the No. 2 colliery of the Red Ash Coal Co. for several days, and which caused thousands of dollars worth of damage, was extinguished on Dec. 9. Water was used to fight the flames. Pipe lines were laid into No. 2 slope and a large force of men were put to work day and night. The cause of the fire is not known.

Bituminous

Connellsville—Two hundred and forty-nine additional ovens were recently put in blast in the Connellsville region, the weekly coke production being now approximately 437,000 tons. The total number of ovens now in operation is about 32,000.

Portage—The local plant of the Miller Shaft Coal Co. was recently compelled to suspend operations as the result of an accident. The breaking of the "bull" wheel allowed the cages to drop to the bottom of the shaft, resulting in their destruction. No one was injured. The cause or reason for the failure of the wheel is not known.

WEST VIRGINIA

Charleston—Fifty-five fatalities in the coal-mining industry were reported to the State Workmen's Compensation Commission for November; 23 of these were caused by the explosion at Boomer the last day of the month. Aside from these the number of deaths for November in all industries was the same as in October, being 40.

A mine-rescue car for the State Department of Mines is proposed. The need of this car has been pointed out by Earle Henry, chief of the Department of Mines, who states that there are 1,100 mines in the state, employing 80,000 men. It is said that had such a car been in use at the time of the Boomer disaster, fewer fatalities would have been the result of the explosion, as it is believed that such a car could have reached the scene in time to have saved many lives.

Gary—The United States Coal and Coke Co. is advertising for more men. This firm is attempting to increase the output of its coke ovens to 2,500 tons per day. It is in need of coke-yard men, coal miners and coal loaders, to the number of about 500.

Phillippi—Improvement in the coal and coke industries of Barbour County continues. The Junior mines, which were closed for a year, are now operating up to the car supply, and more workmen are needed. The coke ovens at this plant have also been fired. The Gage Coal and Coke Co. has fired the 60 ovens at the company's plant. Scales for weighing the mine cars have been installed and the men are now paid by weight instead of by the car, as formerly.

KENTUCKY

Whitesburg—Reports from the Letcher County coal field are to the effect that mining operations have been making a continued increase during the last several weeks, while further increases are said to be planned by all the operating companies. The railroads report an increase of nearly 40 per cent. in coal shipments in the last month and improvement of trackage and equipment is in order.

Providence—The Lamb Coal Co. is opening a new mine at Wheatcroft. The shaft adjoins the Illinois Central R.R.

OHIO

Columbus—Miners in western Pennsylvania, Ohio, Indiana and Illinois have asked the operators in the four states to meet in informal conference for the purpose of discussing the question of reviving the four-state wage agreement. So far the operators in Ohio have not expressed a willingness to meet in conference with the miners. Some time ago when Ohio operators were sounded on the question the opinion was almost unanimous that Ohio would not join the other states in the agreement and it is doubtful if operators in other states want the four-state agreement revived.

Stripping operations in Jefferson County, Ohio, are proving successful. The Piney Fork Coal Co., which has offices in Columbus will soon be in a position to load coal at its new operation along the Wabash R.R. The gigantic electric shovel has been installed and the past two weeks has been devoted to removing the earth from the coalbed. It is believed that coal will be loaded by Dec. 15. The Modern Coal Co., which is a subsidiary of the Hocking Fuel Co. has been loading at its stripping operation at Parlette, Ohio for more than a month. The output up to date is in excess of 8,000 tons and the daily capacity is now about 500 tons. Pennsylvania capitalists have started a stripping plant in the same section.

Athens—An order has been issued by the State Industrial Commission's Department of Mines requiring all Ohio mine operators to install a system of checking the employees, as a matter of safety. Checks are to be issued to all persons entering a shaft mine, which must be given up and preserved when they leave, thus forming a record. An order was issued in May suggesting such a system for all shaft mines and all other mines generating gas.

Bellaire—The new mine of the Morgan Coal Co. at Bannock is ready to start operations and will begin working as soon as power can be secured. The company has a contract with the Sunnyside Electric Co. for furnishing power, but the wiring has not been completed. The Morgan mine, at Edge Hill, is still operating, although it will soon be exhausted. The machinery and equipment will then be transferred to the Bannock mine.

ILLINOIS

Duquoin—Depositors of the defunct private bank of Henry Horn, coal operator, have been notified that the trustees of the estate have realized enough from the sale of property to pay a 20 per cent. dividend early in January. This means that about $60,000 will be distributed.

Johnson City—Installation of equipment at the Stiritz mine near here has been completed and operation has begun. The company is composed of local men, headed by City Treasurer A. C. Stiritz. The shaft is located on the old Stiritz homestead.

IOWA

Des Moines—Ten first-aid teams of six men each have been organized by J. J. Forbes, representative of the bureau of mines. This marks the first permanent organization effected in any county of district No. 13, which comprises all of Iowa and northern Missouri. Mr. Forbes has concluded his safety-first campaign at the Iowa Industrial Hospital, but will keep in touch with the teams and return to Des Moines from time to time.

Iowa coal mines are now being operated only 80 per cent. of the time. Most of them are open only five days a week.

according to mine inspectors in conference here. Mild weather has decreased fuel demands. As a general rule the mines are running full blast the early part of December.

WASHINGTON

Zillah—A discovery of coal about 2 mi. from town recently caused the Northern Pacific R.R. to send its experts here to make surveys and tests with a view of securing a new supply for trains.

FOREIGN NEWS

Zurich, Switzerland—Reports reaching here from Austria are to the effect that the supply of coal in Vienna is so small that the question of lighting the city has become acute. The Burgomaster has appealed to the Governor to provide coal for the municipal gas works, so that the capital may not be left in darkness. The city of Laibach and Styria, it is reported, already are without gas on account of the lack of coal.

PERSONALS

E. L. May has severed his connection with the West Virginia Coal Co., to join the selling force of the St. Louis Coal Co.

Paul Bray, recently assistant sales manager for the Joe Taylor Coal Co., St. Louis, Mo., has gone over to the selling force of the Briquette Mfg. Co.

F. L. Swanson, formerly associated with the Kerens-Donnewald Coal Co., has allied himself with the selling force of the West Virginia Coal Co., of St. Louis, Mo.

John J. McDonald, at Hannastown, Penn., was recently appointed mine inspector of the Greensburg District, succeeding D. J. Blower. Mr. McDonald has for many years been the mine inspector of the Jamison Coal and Coke Co.

John Bradwell, of Nesquehoning, Penn., who has been in the employ of the Lehigh Coal and Navigation Co. for 65 years, has been retired by the company on a pension. At the time of his retirement he was assistant mine foreman.

D. J. Stoddard, for several years manager of the People's Mine at Lebanon, Ill., has been promoted to the newly created office of mine superintendent and is succeeded as manager by Thomas Jones. Heretofore Stoddard has acted as both manager and superintendent.

Maj. E. C. Camp, of Knoxville, Tenn., president of the Coal Creek Coal Co., at Coal Creek, Tenn., has been chosen by the Tennessee delegation to the National Rivers and Harbors convention now in session at Washington, D. C., as their candidate for vice-president of that organization.

George W. Fleming has been elected president of the Elkhorn Coal Corporation, which was recently formed by the merger of the Elkhorn Fuel Co., the Elkhorn Mining Co. and the Mineral Mining Co. The firm of which Mr. Fleming is president will operate a large coal tract in the eastern coal fields of Kentucky.

R. H. Buchanan, at present superintendent of the Pine Hill Coal Co.'s colliery at Minersville, Penn., has resigned and it is reported that on Jan. 1 he will enter the employ of the Delaware & Hudson Coal Co., at Scranton. A number of mining men from the Schuylkill County field have taken positions with this company during the past year.

F. Peiter has severed his connection as coke-oven engineer with the Gas Machinery Co., of Cleveland, Ohio. For three years past Mr. Peiter has been engaged in designing and developing the top-burner regenerative coke oven for the Gas Machinery Co. Previous to this association, he was connected with the H. Koppers Co. as designing and constructing engineer. Mr. Peiter has several connections in view, but will take a rest before assuming other responsibility.

General Superintendent William Reinhardt, of the Mineral Coal and Mining Co., at Shamokin, Penn., it is reported will retire from the service of that company on Jan. 1. With his retirement a change in the official personnel of the Mineral company's collieries will be made. Superintendent Auman, of the Lykens-Williamstown district will succeed Mr. Reinhardt, Superintendent Randall, of the Lytle colliery, at Minersville, will go to the Lykens field, A. E. Van Horn, superintendent at William Penn colliery goes to Lytle, while David Williams, at present an official in the Susquehanna field of that company, will succeed Mr. Van Horn.

OBITUARY

William A. Conner, of Plainfield, N. J., died recently at his office in Perth Amboy. Mr. Conner was born in Baltimore in 1859, beginning his business career in Pittsburgh in 1876 in the oil-refining business, in which he later reached the position of assistant manager of the Standard Oil Co. In 1885 he took charge of the first plant built by the Standard Underground Cable Co. in Pittsburgh, and from then until the time of his death he was the head of the manufacturing business of that company, including large plants planned and built by him in Pittsburgh, Penn., Perth Amboy, N. J., Oakland, Calif., and Hamilton, Ont. He has resided in Plainfield since 1904. Mr. Conner, who was a relative of O. G. Waring, of the Standard Oil Co., E. J. Waring, of the Standard Underground Cable Co., and of the late Richard S. Waring, founder of the Standard Underground Cable Co., is survived by a widow, a brother and a sister.

INDUSTRIAL NEWS

Philadelphia, Penn.—The Philadelphia & Reading Ry. in November hauled the largest tonnage of anthracite coal in its history, for that month, 1,163,851 tons, which was an increase of about 30,000 over the previous best November, that of 1911.

St. Louis, Mo.—The Laclede Steel Co., of this city, has purchased the plant of the Alton Steel Co., of Alton, Ill., which was sold recently to Pittsburgh interests under a foreclosure sale. The plant will resume operations Jan. 1, with about 400 men.

St. Louis, Mo.—Increased rates ranging from 3 to 20c a ton on coal in carloads over the Missouri Pacific Ry. from producing points in southern Illinois to stations in Missouri were recently suspended by the Interstate Commerce Commission until Apr. 13.

St. Louis, Mo.—A bill was presented recently before the Board of Aldermen, seeking to supplant the present system of municipal inspection and weighing of coal, eliminating the city weight tickets costing 3c. each required with each load. If enacted into law, it will save to the coal dealers about $30,000 annually.

Terre Haute, Ind.—The Indiana Gas and Coke Co. has let the contract for its plant to the Gas Manufacturing Co., of Cleveland, Ohio. It will represent an expenditure of $750,000 and will have 30 ovens. The subcontract for the coal and coke handling machinery has been awarded to the Heyl & Patterson Co., of Pittsburgh.

Charleston, W. Va.—Harrison B. Smith, Buckner Clay and others, of this city, have organized the Mann's Creek & Meadow River Ry. Co., for the purpose of constructing a line of railroad from Ephraim's Creek to Brackin Creek, in Fayette County, tapping an extensive coal field. The company is capitalized at $100,000.

Whitesburg Ky.—The Consolidation Coal Co., of Jenkins, which is supplying all the near-by operations with light and power, is building transmission lines from Wayland and Garrett, on Beaver Creek, via Lackey, Beaver and Harold, to Pikeville, Pike County, to a connection with the transmission lines there from Jenkins.

St. Louis, Mo.—The Interstate Commerce Commission has set Dec. 27 for the taking of testimony in the case of the Coal Operators Traffic Bureau of St. Louis vs. the Terminal R.R. and other carrier defendants, alleging an overcharge of 5½c. per ton on all soft coal originating in Illinois and delivered in St. Louis between the dates of Feb. 1 and Sept. 30, 1915.

Wheeling, W. Va.—It is stated that actual work has begun on the erection of a power plant at Beech Bottom. It is stated that this generating plant will be second only to the power house at Niagara Falls and will, when completed, be in a position to furnish the entire section with power. It is further stated that an electric railroad will be built to the coal fields of Pennsylvania.

St. Louis, Mo.—A traction line from Bicknell, Ind., in the Knox County coal fields to Evansville, Ind., is being planned, and it is said the line will be surveyed in a short time. A Cincinnati concern is building a $100,000 power plant at Bicknell to supply the city and the coal mines with power, and it is said the plant will also furnish a part of the power for the new traction line.

Ramy, Penn.—T. E. Womelstorff and G. F. Dunkle, operating under the name of the Bermosham Coal Co., recently purchased the Eureka No. 16 Mine from the Berwind-White Coal Mining Co. This firm is operating in the Moshanon seam of coal. The present output is about 100 tons per day, which it is proposed to increase as rapidly as possible. Later on, the B or lower seam will be developed.

Buffalo, N. Y.—A final test of the new McMyler box-car loader was recently made at the coal docks of the Lehigh Valley company here with what appears to have been entire success. Being a new invention the work was slow and it appears to have been perfected only for work on the last Lake cargo of the season. In case it is found to work satisfactorily all work of loading in the Lake trade will be done by it.

Reading, Penn.—The Reading and the Pennsylvania railroad companies have been storing large quantities of bituminous coal for the past two months. The Reading has dumped several thousand tons and a large number of cars have been sidetracked in the vicinity of the water station. This fuel is stored to guard against a sudden change in the weather which would render shipments from the mines uncertain.

Brookville, Penn.—The Pawnee Coal Co., recently incorporated and having large holdings in Knox Township, Jefferson County, Penn., is working out preparations which will, if carried out, eventually make it one of the most important independent concerns in this immediate section. Power plant machinery is being installed and coal cutters will be added shortly. An output of 500 tons per day is anticipated in the near future.

Uniontown, Penn.—To take the place of men which it cannot secure, the Oliver & Snyder Steel Co. is installing two Covington coke-drawing machines at its No. 2 plant. The company has been unable to secure enough men to operate 275 of the ovens. These machines can each pull 40 ovens per day. The plant has been operating six days per week and at the greatest capacity which the limited number of men available would permit.

Harlan, Ky.—The White Star Coal Co. has been organized it Wilhoit, near here, in the Harlan County coal fields, by Major Moss, R. B. Moss, M. J. Moss, Jr., W. L. Moss and R. L. Phillips, all of Pineville, for the purpose of starting work immediately on a coal development near Wilhoit. It is expected, also, that the company will take over the Moss Coal Co., at Wilhoit. The company plans a daily capacity of about 2,000 tons. Mines will be electrically equipped.

Birmingham, Ala.—It is stated that in order to meet the demand for coal resulting from the blowing in of numerous furnaces in the Birmingham district, five new coal mines will be opened in Bibb County in a few weeks. Definite plans have been made by the Coyle Coal Co. for the expenditure of several thousand dollars in the opening of the new mines, the exact amount of which cannot now be determined. The work of erecting the new plants will begin immediately.

Buffalo, N. Y.—With the close of the Lake season the shipping trestle of the Delaware, Lackawanna & Western company will be abandoned and torn down, in accordance with the order of the Secretary of War, to make way for a dump and car loader that will obstruct navigation less. A tariff has been issued for continuing shipments over the Erie Railroad trestle, as the company commonly continues to load storage coal during the winter, for shipment next season.

Cleveland, Ohio—Officials of the Pursglove-Maher Coal Co. and of W. H. Warner & Co., recently announced that they had purchased jointly a coal dock at Superior, Wis., known as Dock No. 4. This dock was purchased from the Reiss Coal Co., of Sheboygan, the site being owned by the Northern Pacific Ry. The Cleveland firms will take possession of the property in May, 1916. This dock has a capacity of 300,000 tons per year and will enable the two concerns to enter a new market.

Charleston, W. Va.—A decree foreclosing a mortgage on the properties in this state of the Paint Creek Collieries Co. and ordering a sale of the holdings for the benefit of bondholders, was recently entered in the United States district court by Judge B. F. Keller. The Scranton Trust Co., of Scranton, Penn., which petitioned for the decree, alleged that the company had defaulted in the payment of interest on $3,000,000 of first-mortgage bonds. No date was set for the sal of the property.

Benton, Ill.—The Illinois Central R.R. Co. is seeking by quo warranto proceedings to get control of a charter granted the Toledo, St. Louis & New Orleans R.R. and the Gulf Line Connecting R.R. of Illinois, to enable the construction of a 100-mi. railroad from Metropolis to Grayville, which would afford an outlet for the big coal fields of that section. The Illinois Central is said to contemplate the expenditure of approximately $3,000,000 on the road. It is hoped to start work early in the spring.

Pittston, Penn.—James White and Theodore Hogan, independent coal operators, have driven a drift into the Checker vein on the old 60-acre Bowkley tract, in Upper Pittston, preparatory to mining operations. The Checker vein and splits from the Red Ash and Marcy underlie the tract. The coal will be sold to the Lehigh Valley and will be prepared at the Senaca breaker, only a short distance away. Much of the mineral in the Checker vein is virgin coal, but the operations in the other measures will be remining.

Cleveland, Ohio—The most important deal put through since the scramble for bulk freighters was started by the Great Lakes shippers and consuming interests more than a month ago was closed when the Cambria Steel Co. and M. A. Hanna & Co., jointly bought four 10,000-ton steamers from the Frontier Steamship Co., of Tonawanda, and one steamer of the same class from the Niagara Transit Co. of the same port. The price paid for the ships was not given out, but it was believed to be something more than $1,500,000.

Ethel, W. Va.—The Rex Coal and Coke Co.'s mine, at Ethel, W. Va., was sold Dec. 6. The new company will operate under the name of New Rex Coal and Coke Co., and will be managed by the following men: L. R. Reese, president, Huntington, W. Va.; J. F. McClung, vice-president and general manager, Ethel, W. Va.; George S. Wallace, secretary and treasurer, Huntington, W. Va. This mining property is known as one of the very best in the Logan field. Negotiations for the sale were conducted by Karl F. Schoew, consulting mining engineer and coal-land broker, of Huntington, W. Va.

Buffalo, N. Y.—The Donner Steel Co. has been incorporated, with a capital stock of $5,000,000, to take over and operate the blast-furnace plant of the New York State Steel Co. The plant, which is to be extensively enlarged, will use large tonnages of coal and coke. The present blast furnace and openhearth furnaces and the blooming mill will be started about Jan. 15, as soon as necessary repairs can be made. Mr. Donner, president of the company, states that a new blast furnace will be built at once and that the company also plans to build a byproduct coking plant to cost $1,500,000.

St. Louis, Mo.—Railroads operating eastward from St. Louis report that the volume of traffic exceeds nearly all periods in which comparisons should be made and that the diversification of freight is now greater than for several years. The westbound movement of freight which has lagged for more than a year is now again about normal. Western roads for the past week report gains ranging as high as 65 per cent. in some commodities over a year ago. The gains in all classifications reflect a sharp betterment. Southern roads report improvement in all classifications of freight. Business is picking up rapidly. Grain, principally corn, is moving freely.

Philadelphia, Penn.—Local exporters of bituminous coal have had their attention called to the extreme shortage of fuel in Italy. The prices have soared rapidly in the past few weeks until $40 has been asked for a ton. It is understood the Italian Government is having considerable difficulty in keeping the various public utilities, such as water-works, lighting plants and gas concerns, in operation. Inasmuch as Italy has no coal mines, it is dependent on other countries and since it became involved in the war the only supplies have been coming from England and in a small measure from the United States. Those consulted in the trade here can hold out but little encouragement of increased shipments from this country, due to the greatly increased consumption at home and also owing to the lack of ships in which to carry the coal.

Uniontown, Penn.—The Tower Hill-Connellsville Coke Co., its receivers, L. W. Fogg, G. S. Harah and John R. Thompson, and the Citizens' Title and Trust Co., of Cleveland, Ohio, are made defendants in a proceeding instituted before Judge E. H. Reppert. J. P. Nutt, Andrew Squire and Philip A. Meyers, holders of general mortgage and improvement bonds of the coke company, have filed a petition praying for the foreclosure of the mortgage given to protect bondholders. The action arises from the failure of the company to meet the last two semi-annual payments of interest on its bonds which were issued Sept. 1, 1910, to the amount of $1,000,000. Under the terms of the mortgage, holders of 25 per cent. of the bands issued can take steps to foreclose in event of default in payment of interest. The petitioners in the present action allege that the trustee has, after due notice, failed to act, and the bondholders named now appeal to the court for enforcement of the provisions of the mortgage. An answer to the petition must be filed within 30 days.

Coal Trade Reviews

General Review

Severe weather precipitates a rush for anthracite. Speculative element in control of the bituminous market and spot tonnages commanding high prices. Coal famine in parts of Europe.. Middle Western steam coals make substantial gains and there is considerable stocking.

Anthracite—Storms and lower temperatures, particularly severe at the opening of the week, interrupted deliveries, and caused a heavy influx of rush orders. The situation is decidedly strong, and shows every indication of gaining momentum as the season advances. Pea coal continues the leader, with prices at a high level, and consumers crowding the producers for maximum tonnage. Steam sizes, acting in sympathy with the rapid advance in bituminous, are firmly established at full circular prices, or better, with buyers showing more interest each day. Lake shipments wound up with a rush though the gross tonnage for the season showed a loss, due to the lack of storage room at upper ports.

Bituminous—The soft-coal market has developed into a highly speculative proposition, coal at destination ready for unloading, frequently changing hands several times. The situation is marked with a certain tenseness, as is evident by the fact that large consumers are sending representatives into the mining regions to look up extra tonnage, and by the further fact that there have been tentative negotiations on Pittsburgh coal for delivery at Tidewater points. Prohibitive coastwise freights have diverted considerable business to the Pennsylvania all-rail fields and there is a marked anxiety among consumers at Down East points. Some exceptionally high prices have been done in the spot market on Southern coals, but there is only a meagre tonnage available for such business.

Export—Foreign cables report fabulous prices, and impending coal famines in certain of the nonproducing European states, in spite of which the export movement is constantly receding. The situation is aggravating in the extreme to prospective exporters, and it is difficult to foresee any relief. Each week sees vessel rates marked up to new high levels, and foreign shipping has been confined for some time to contract obligations. Evidence of the restricted market for export fuels is seen in many directions; so much surplus West Virginia coal has been diverted to the Middle West that these grades are noted for their heaviness in an otherwise uniformly strong market, while tonnage statements of the Tidewater coal roads show significant losses, both in the movement and loading at Hampton Roads.

Ohio Valley—The lower temperatures have had a beneficial influence on the local market, though there is no appreciable increase in the business. Further expansion in manufacturing demand, and Eastern inquiry for Pittsburgh coal at Seaboard points, are constructive factors indicating an expanding market, though the demand from these sources has not been in sufficient volume to materially affect the situation. The car shortage remains an important influence in the market; Ohio roads are apparently much better equipped in this respect, and consumers of West Virginia coal are beginning to divert some of their business to operators in the former state. Lake insurance expired at midnight, Dec. 12, and the shipping season is now definitely closed.

Middle West—There is further evidence of increased strength on the steam sizes, prompt tonnages commanding substantial premiums, and indications pointing to higher price levels on these grades than for several years. Manufacturing and railroad interests are taking heavy tonnages, and industrial plants having orders for their products well ahead, and now taking energetic measures to insure their fuel supply. Occasional concessions are noted, but on the whole, the circulars are well supported. Relatively mild weather in the extreme Northwest has restricted domestic buying, though prices remain firm. The expected relief from the car shortage, resulting from the release of equipment used in the Lake trade, has not had time to materialize, though it is noted that the shortage is a trifle less stringent at the moment.

A Year Ago—Cold weather causes a sharp advance in anthracite, though the wholesale market continues heavy. Bituminous operators still pushing vigorously for business. What few changes there are seem to be of a constructive nature.

BUSINESS OPINIONS

Iron Age—Current market reports still deal largely with business offered, which steel companies cannot entertain. Yet in November, when a similar condition prevailed, actual bookings were enormous, as the Steel Corporation's increase of over 1,000,000 tons in unfilled orders is full proof. Some independent companies also booked nearly as much as they shipped last month, but others kept their new contracts down. The outcome of the railroad congestion, particularly in the East, is a matter of no small concern. Iron ore, pig iron and finished materials have been active in the past week in the order named.

Boston News Bureau—It would be difficult to imagine a situation more difficult to diagnose. Now it is the Austrian note, and there are serious potentialities regarding this. But it has been a question of notes for a long time without any important results. There is, however, a more or less indefinite feeling as to the future. There is certainly no greater evidence of peace. There is no longer any doubt as to our business recovery. The improvement is evidently here to stay. When our defence program is started the incentive to much greater activity will be at hand.

Dun—There is no longer complaint of deferred buying, but of difficulty in meeting the steadily expanding requirements. Consumptive demand exceeds supply in some lines and distributing channels are obstructed by the congestion of freight, rail and oversea shipping facilities still being inadequate to cope with the rush of traffic. Evidence of a further recovery in the building industry is provided by the building permits taken out during November, the total from the building departments of 79 leading cities in the United States calling for the expenditure of no less than $56,339,078, an increase of 70.3%, as compared with the $33,073,525 reported for the same month last year. The gains made in November and in the two preceding months have more than made up for the falling off in the earlier months, and the total is not only greater for the year to date than in 1914, but is also well up to that of the active year 1913.

Bradstreet—All reports agree that movements are smarter than they have been at this season for three years past, and in some aspects the situation excels the flush times of December, 1906. Activity covers a multiplicity of lines; whereas this season of the year usually finds wholesale trade quiet, with inventories either under way or in preparation, present currents are such that seasonal dullness is conspicuous by its absence. Business failures for the week ending Dec. 9 were 373, which compares with 333 last week, 427 in the like week of 1914, 371 in 1913, 281 in 1912 and 309 in 1911.

American Wool and Cotton Reporter—The wool market has remained quiet because mills have been taking account of stock, and getting ready for the new season. A fair amount of business has been transacted both in foreign and domestic wools. Values are tending upward in sympathy with the foreign market. Mills are running largely on domestic business, which are in greater volume than war orders.

Marshall Field & Co.—Current wholesale distribution of dry goods for the week was in greater volume than in previous years. Many lines have been advanced, and the market continues firm. Collections are better than last year at this time.

Southern Lumberman—Stability of the yellow pine market, at the price advances which have been noted during the past two months and with present increases in value, now seems assured. This condition is due to the continued and extensive building activity which the unusually fine weather of the fall and early winter has permitted, and to the fact that the railroads are again in the market, on an extensive scale. Despite the near approach of the time for taking inventories and the general slackening up in buying which customarily precedes that business function, in order to put purchases of raw material on the expense sheets of the coming year, the hardwood market is also coming down the home stretch of 1915 with increasing momentum. Consuming factories apparently realize the strength of the market, and exhibit a disposition to buy somewhat in advance of their requirements.

ATLANTIC SEABOARD

BOSTON

Pocahontas and New River temporarily cut off from Eastern spot market. High prices rule at distribution points. Georges Creek out of the market. Pennsylvania grades very active at new high figures. Water freights soaring. Anthracite deliveries slow; active demand.

Bituminous—With Pocahontas and New River at Hampton Roads there is no material change. Accumulations are still heavy and aside from steamers, arrivals are very slow. There is much anxiety in this territory over the light shipments the last month or more and a good many consumers with coal due them are trying to buy all-rail to give them the reserve stocks they require. The situation gets worse from day to day and unless the weather clears for longer periods allowing tows to move, or unless more steamers are available, New England will be getting seriously short of steam coal. It is only a question of time when prices f.o.b. Hampton Roads will stiffen with those at Philadelphia and New York, but as it is the famine in boats is so great that there is small opportunity for merchants to speculate by getting cargoes forward. What boats are chartered at current rates are chiefly to replace others that are behind schedule or lost, and practically all of the coal is for application to season contracts.

As high as $6.25 has been paid for spot Pocahontas and New River on cars, Boston, for delivery up the line, but these grades are available only in small quantities.

The Georges Creek shippers have practically withdrawn their coal from the market and are confining themselves to contract business. Orders are being filled with reasonable promptness but interruptions are feared for the near future. All-rail deliveries do not improve.

The market for the Pennsylvania grades, practically the only coals available for this market for anything like prompt shipment, is very active with prices advancing from day to day. While it is understood that numbers of shippers sent cars forward to the transfer points in anticipation of such a market, yet prices are firm up to $2.75 at the mine and buyers are thick in the regions. Only a fair grade of Somerset County coal sold at more than $5 a week ago, and $4 f.o.b. Philadelphia is not far from the market price there.

Boston dealers advanced contract prices on bituminous from $4.40 to $4.65 per ton of 2,000 lb., delivered by team, beginning Dec. 31.

Water Freights reach a new notch every few days. Bottoms are so scarce that there is no knowing how high rates will go; $3 has been paid to Boston from Hampton Roads, and $2.75 to Providence. One charter is reported of a barge of any size and at any time between now and Mar. 1 at $2.50 to Boston. It is hard to see how freights can recede for a long while to come, unless a lot of tonnage now offshore is attracted to the coastwise trade by rates now prevailing.

Anthracite—Orders continue to pile up and there is a good deal of uneasiness on the part of Tidewater dealers over slow shipments. Some retailers are entirely out of certain sizes, and meanwhile the weather continues cold and unfavorable to movement along the coast.

Bituminous quotations, f.o.b loading ports at points designated, are about as follows:

	Philadelphia	New York	Baltimore	F.o.b. Mine
Clearfields	$3.60@4.00	$3.85@4.25	....	$2.40@2.75
Cambrias and Somersets	3.75@4.10	4.00@4.35	....	2.50@3.00
Georges Creek	....	....	....	(Nominal)

Pocahontas and New River prices, on cars Boston, are $6@6.25; Providence, $5.75@6; and f.o.b. loading ports at Hampton Roads, $2.85.

NEW YORK

Anthracite market stimulated by cold and storms. Domestic coals easy but in good demand. Steam grades strong. Bituminous active with Pittsburgh grades being offered here. Many export inquiries.

Anthracite—Colder weather and storms early in the week stimulated the hard coal situation and the market has tightened up. Deliveries were for a time somewhat delayed. Wholesale dealers received many inquiries as to the outlook but were able to reassure their customers. Efforts to increase the movement from the mines met with no more success than last week.

The companies are easy on all domestic coals. Stove is moving slowly, dealers being asked to take mixed cargoes where this size is wanted. There is plenty of egg to meet all demands and chestnut is easy. No pressure is being brought to bear on individual coals which are apparently well sold up. The steam grades are strong. Pea is easy and commanding full circular. All small grades are commanding full prices, the low ash coals being practically sold out. Very little No. 2 buckwheat is to be had at the upper ports.

Reports from along the line are encouraging. Most dealers are fairly well supplied but there is complaint of poor deliveries by the railroads. Demand from New England continues heavy. There is much anxiety over the high water rates and it is predicted that buyers will soon order shipments direct from the mines. This will help to relieve the situation at Tidewater.

Quotations, f.o.b., gross tons, at Tidewater, follow:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$5.05		$5.10	
Egg	5.30	$5.30@5.30	5.35	$5.35@5.35
Stove	5.30	5.30@5.30	5.35	5.35@5.35
Chestnut	5.55	5.55@5.55	5.60	5.55@5.60
Pea	3.50	3.45@3.50	3.55	3.50@3.55
Buckwheat	2.75	2.45@2.75	2.80	2.45@2.80
Rice	2.25	1.95@2.25	2.30	2.00@2.30
Barley	1.75	1.50@1.75	1.80	1.75@1.80

Bituminous—The soft-coal market is active and prices have advanced from 35c. to 50c. over last week, due to the slow delivery. Offers to ship Pittsburgh high volatile coal at $1.25 f.o.b. mines have been received by many local dealers but no orders have been reported as yet.

There has been no improvement in the congestion and many shippers have boats tied up at the docks waiting for deliveries. This has caused an increased shortage of bottoms and also an advance in the harbor freight rates, quotations going as high as 35c.

There is not much quibbling over prices or quality in negotiations on free coals. Contract holders continue to take their full allowance and more when they can. There is sufficient coal at the docks to meet urgent demands but it is nearly all contracted for, very little free coal being offered. Slack is quoted at $1.50 to $1.60.

Current quotations on the various grades, f.o.b. gross tons, at Tidewater follow:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$4.30@4.55	$4.30@4.55	$4.30@4.55	$2.75@3.00
Georges Creek Tyson	3.80@4.00	3.80@4.00	3.80@4.00	2.25@2.50
Clearfield:				
Medium	3.80@4.05	3.80@4.05	....	2.25@2.50
Ordinary	3.70@4.20	3.70@4.20	....	2.15@2.40
Broad Top Mountain	....	....	....	2.25@2.50
Cambria County:				
South Forks	3.80@4.05	....	....	2.25@2.50
Nanty Glo	3.80@4.05	....	....	2.25@2.50
Barnesboro	3.75@4.00	....	....	2.25@2.50
Somerset County:				
Quemahoning	....	3.80@4.00	3.80@4.00	2.25@2.50
Medium	3.75@4.00	3.75@4.00	3.75@4.00	2.25@2.50
Latrobe	3.55@3.70	....	....	2.00@2.15
Greensburg	3.65@3.80	....	....	2.00@2.15
Westmoreland	3.55@3.75	....	....	1.80@2.00
West Virginia Fairmont ¾		3.30@3.40	3.30@3.40	1.50@1.60
Fairmont mine-run	....	3.30@3.40	3.30@3.40	1.50@1.60
Steam	....	3.55@3.65	3.55@3.65	2.00@2.10
Western Maryland	....	3.55@3.70	3.55@3.70	2.00@2.15

PHILADELPHIA

Anthracite brisk with particularly strong demand for buckwheat and rice and heavy orders for pea. Chestnut also beginning to move and broken shows a substantial increase. Bituminous prices touch the $2 mark with the demand still on the increase.

Anthracite—The cold weather and storms have opened up the anthracite trade in full blast and the situation shows indications of continued activity for some time to come. If railroad facilities permit, December tonnage records will no doubt be broken as the trade will gather still greater momentum as the season advances. The dealer trade and manufacturers are now taking energetic measures to cover their requirements and this condition will shortly spread to domestic consumers. But in spite of the strong technical position of the market, there is still a pernicious price-cutting being carried on in certain quarters.

Pea coal continues the leader, individuals now obtaining $2.50 and the tax on this grade, as compared with $1.75 last summer. The $2 and tax price, at which the big companies have protected customers, is probably one of the biggest bargains the trade has known for a number of years.

Broken coal continues brisk at $3.25 on contracts and $3.50 in the spot market, both including the tax. The companies have notified their customers that this grade will be advanced 10c. on Jan. 1, when the current contract expires, so that buyers are urging as rapid deliveries as possible. Egg coal is the only weak size, individuals having been compelled to make concessions of 15 to 25c. off the $3.75 circular price on cars standing at the mines without orders. Stove continues strong at the full circular of $4.90 and the tax, and there is apparently little surplus of this grade available.

The outstanding development of the week has undoubtedly been the impressive advance of the steam coals which are now commanding the full circular, even on the storage grades. The steam sizes have apparently been carried up with the rapid advance in bituminous coal, with which they are in competition, and with hundreds of thousands of tons in storage, the increased demand is more than welcome. The call for buckwheat has been so heavy that many orders are still unfilled, and rice coal, which has been dragging behind for so long, is now moving with no trouble.

The announcement of an increase in prices on the new contracts, effective Jan. 1, was another important development of the week, and has caused a marked hesitancy on the part of buyers, so that negotiations on this business are behind a normal season.

The circular prices per gross ton at the mines for line shipment and f.o.b. Port Richmond are as follows:

	Line	Tide		Line	Tide
Broken	$3.50	$4.75	Pea	$2.50	$3.25
Egg	3.75	5.00	Buckwheat	1.50	2.25
Stove	4.00	5.00	Rice	.85	1.75
Chestnut	4.15	5.25	Barley	.50	1.50

Bituminous—The demand for coal is increasing at such a rate that some big consumers are sending their purchasing representatives to the mining regions. Brokers and speculative interests are active and it is nothing for a car of coal, after reaching destination, to pass through three or four hands before it reaches the ultimate consumer. In addition to the rapidly increasing local demand there is a growing demand for coal from the New England territory via rail because water freights have advanced to such a point that it is more advantageous to get shipments by rail. Prices have gone steadily upward and the $2 price has been recorded for four or five of the different grades. There is hardly any foreign trade outside of that contracted for some time ago. While prices for the local trade are only quoted for prompt acceptance, often changing over night, the following table will give an idea of the average, prevailing up to date, per gross ton at mines:

Georges Creek Big Vein	$2.20@2.30	Fairmont gas, ¾	$1.60@1.70
South Fork Miller Vein	2.25@2.30	Fairmont gas, mine-run	1.40@1.50
Clearfield (ordinary)	2.00@2.15	Fairmont gas, slack	1.20@1.30
Somerset (ordinary)	2.00@2.10	Fairmont lump, ordinary	1.45@1.55
West Va. Freeport	1.90@2.00	Fairmont mine-run	1.35@1.45
		Fairmont slack	1.20@1.30

BALTIMORE

Car supply occasionally down to 25% requirements. Vessel freight rates at prohibitive levels. Practically no coal at Tide. Heavy snow complicates retail situation.

With the Baltimore & Ohio, Western Maryland and Pennsylvania supplying at times, less than 25% car requirements at the mines, coal has been growing steadily scarcer at the terminals. The supply at Tide here occasionally falls off to practically nothing. Many coals are selling at big advances over what they would bring at the mines if cars could be supplied. Some of the railroads such as the Erie and Lehigh Valley have sent their own equipment to mines on the Baltimore & Ohio to obtain coal for their own use. Where coal is bought on a basis insuring early delivery prices are substantially higher.

Quotations, while changing from day to day, are about as follows:

	Mines	Balt.*	Fairmont	Mines	Balt.*
Geo. Crk. Big Vein	$2.50	$3.68	Ordinary mine run	$1.65	$3.13
Geo. Crk. Tyson	2.10	3.28	Ordinary ¾	1.80	3.28
Clearfield	1.90	3.08	Ordinary slack	1.25	2.68
South Fork	1.95	3.13	Low sulphur mine-run	1.90	3.38
Latrobe	1.85	3.03	Low sulphur ¾	2.00	3.48
Somerset (best)	1.90	3.08	Low sulphur slack	1.30	2.73
Somerset (good)	1.80	2.98			
Quemahoning	2.00	3.18			
Freeport	1.80	2.98			
Miller Vein	1.90	3.08			

* F. o. b., outside Capes.

The retail situation has been complicated by the heavy fall of snow on Monday and Tuesday. This caused an increased pressure for deliveries of anthracite and dealers were forced to draw more heavily on reserve stocks than they desired.

HAMPTON ROADS

Dumpings for week fair. Vessel tonnage scarce and rates high. Concessions on prompt tonnages.

Dumpings over Hampton Roads piers for the week have been fair. Bunkering has been rather light. The accumulation at Tidewater is above normal and demand light, especially on the New River and Pocahontas coals. On high volatiles there seems to be some improvement and some small quantities of gas coal have moved foreign during the week. There is some scarcity of high volatile grades at Tidewater due to the usual demand at about this time in the West. While the regular circular is being quoted it is believed that prompt coal can be bought at 10 to 15c. off. Prices on high volatile range from $2.55 to $2.65.

During the last few weeks householders here have been offered a new fuel in the form of briquettes for domestic use. The promoters claim that they are smokeless and odorless, give 50% more heat and are much cheaper than coal. It is understood that they will sell at about $6 per ton against $7.50 for Pennsylvania anthracite.

Railroad Tonnages—Dumpings over the local piers for the past five weeks compare as follows:

	Week Ending				
Railroad	Nov. 13	Nov. 20	Nov. 27	Dec. 4	Dec. 11
Norfolk & Western	133,329	100,598	118,065	116,450	87,726
Chesapeake & Ohio	70,282	67,209	93,924	81,875	70,535
Virginian	72,888	39,485	54,591	41,386	52,247
Totals	276,499	207,292	266,580	239,711	210,508

Ocean Charters, Clearances and Freights

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	To	Tons	Rate
G. E. Walcott	Buenos Aires	1,388	
C. Davenport	Porto Rico	1,157	
Wm. C. May	Cartagena	607	5.30
D. G. Cressy	Porto Rico	726	
Isthmian	Rio Janeiro	3,463	

VIRGINIA

Vessel	To	Tons	Rate
Platea	River Plate	1,956	12.60
M. W. Bowen	Buenos Aires	1,907	
R. W. Clark	Bermuda	437	3.75

BALTIMORE

Vessel	To	Tons	Rate
Mar Caspio	Barcelona	1,632	
Mar Cor	Italy	2,059	
Gov. Powers	Porto Rico	1,578	
A. W. Barbour	Porto Rico	1,171	
V. A. Boughton	Cuba	1,909	
Bygland	Bocas del Toro	1,464	

VESSEL CLEARANCES

The following steamers have cleared from various ports during the week ended Dec. 10:

NORFOLK

Vessel	Destination	Tons
L. Bossert[1]	Bermuda	842
Adriatico[2]	Naples	5,705
Berwindmoor[3]	Havana	8,000
Eliofoli[2]	Genoa	5,094
H. A. Stone[3]	Cienfuegos	1,993
Antares[3]	Vera Cruz	2,500
A. Barbour[3]	San Juan	1,782

NEWPORT NEWS

Vessel	Destination	Tons
Frankrig[4]	Havana	2,090
Hubert[6]	Para	382
R. B. White[5]	Gardenas	600

NEWPORT NEWS—Continued

Vessel	Destination	Tons
Siam	Buenos Aires	2,293
Kaministigua[5]		2,800

PHILADELPHIA

Vessel	Destination	Tons
Storfond	Havana	
Rio Colorado	Rio Janeiro	
St. Joseph	Savona	
Negus	Sagua le Grande	
E. H. Blake	Bermuda	
St. Gothard	Havana	
F. J. Lisman	Antilla	
Eurasia	Savona	

[1] Castner, Curran and Bullitt, Inc. [2] Pocahontas Fuel Co. [3] Baker Whiteley. [4] Smokeless Fuel Co. [5] Berwind White. [6] Ches. and Ohio Coal and Coke Co., Ches. and Ohio Coal Agency.

OCEAN FREIGHTS

Since last report the Greek Steamer "Platea," about 5,000 tons coal capacity, December loading, was chartered from Virginia to a Lower Plate port at $12.60, with 500 tons per day discharge at 30c., and we have another boat offered on these terms. There is an active demand for steamers for Cuban and West Indian ports and we have recently closed a number of boats on terms quoted below. The only coal that we are moving for Mediterranean ports is on steamers that we are chartering on time charter. About $22.80 is now offered on grain to the west coast of Italy, and vessel owners seem to prefer grain to coal on the same basis of freight.

We would quote freight rates on coal by steamer as follows:

To	Rate	To	Rate
Havana	$3.00@3.25	Bermuda	$4.00@ 4.25
Cardenas or Sagua	3.50@4.00	Vera Cruz	5.50@ 6 00
Cienfuegos	3.75@4.00	Tampico	5.50@ 6 00
Port au Spain, Trinidad	4.75@5.00	Rio	12.00@12 60
St. Lucia	4.75@5.00	Santos*	12 00@13.20
St. Thomas	4.25@4.50	Montevideo	12.60@10.80
Barbados	4.75@5.00	Buenos Aires or La Plata†	12.60@13.20
Kingston	4.25	Rosario	13.20@14.40
Curacao	4.50	West Coast of Italy	22.60@24.00
Santiago	4.00@4.25	Barcelona**	20.40@21.60
Guantanamo	4.00@4.25	Valparaiso or Callao	12.00@13.00
Demerara	6.50@7.00	Marseilles	20.40@21.60

* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British steamers; neutral steamers are more difficult to obtain and the rates are always higher.

W. W. Battie & Co.'s Coal Trade Freight Report.

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge. 24c. per net register ton per day demurrage."

OHIO VALLEY

PITTSBURGH

Inquiry for Pittsburgh coal at Seaboard. Car scarcity continues. Line demand good. Slack higher.

As a result of the heavy demand for coal in the East, it was positively asserted on excellent authority that $1.75 had been bid for Pittsburgh coal where the seller could assure immediate shipment by furnishing car number at the time the business was negotiated. With the car supply continuing very short it has not been possible to accept much of this business, but it is understood that some shippers have been able to take up some of these offers in the case of a few cars. The full quota of empty cars has not returned to the coal mines upon the closing of Lake navigation, just as was expected in some quarters.

Domestic trade has improved considerably and there is a moderately good movement to retail dealers. There continues to be an excellent demand from manufacturing establishments, and perhaps a slight increase. The market is not suffering particularly from the cessation of Lake shipments, as to mine-run and screened coal, while as to slack there is naturally a further stiffening. Prompt slack is now bringing very close to the mine-run basis and in some quarters predictions are made that eventually the two descriptions will sell at practically the same level.

We quote free coal as follows: Slack, $1@1.05; nut, $1.15; mine-run, $1.15@1.20; ¾-in., $1.25@1.35; 1¼-in., $1.35@1.45; on contract to Apr. 1. Slack, $1@1.10; nut, $1.25; mine-run, $1.25@1.35; ¾-in., $1.35@1.40; 1¼-in., $1.45@1.55, per net ton at mine. Pittsburgh district.

BUFFALO

Marked activity in bituminous and the supply is short. Scarcity of men and cars. Fictitious prices being quoted.

Bituminous—The demand exceeds the supply everywhere and there is no surplus coal. Allegheny Valley grades are difficult to get and prices are past any sort of intelligent quoting. Shippers generally advise making a nominal quotation only, as it is often purely a matter of getting the coal. Slack is sometimes bringing prices that would have seemed extravagant a month ago. One shipper estimates that the Buffalo market proper has advanced 25c. An out-of-town jobber is reported to have bought a block of coal here that he sold in New England at 35c. advance. As a rule the Allegheny Valley mines are out of slack and will not quote on it. Pittsburgh slack is not so scarce and it may not give out.

Quotations are made with a certain reservation, especially as regards Allegheny Valley coal, as follows:

	Pittsburgh	Allegheny Valley	Penn Smokeless
Lump	$2.80	$2.60	$2.55
Three-quarter	2.65	2.40	.....
Mine run	2.55	2.30	2.30
Slack	2.15	2.15	2.30

Quotations are f.o.b. cars at Buffalo or the Niagara bridges and per short ton except east of Rochester or Kingston, Ont.

Consumers of bituminous are now sending in nervous telegrams, urging dispatch on the part of shippers, much as anthracite buyers commonly do in December.

Anthracite—There is some improvement in the demand, and with the coming of snow the trade ought to show more life. Should Canadian activity increase the shippers would be satisfied, though there is not much prospect of regaining the lost tonnage. As the season progresses the prospect of making up the loss becomes more remote though sales are fairly good. Chestnut is very scarce, but egg is abundant. The independent shippers are getting full circular prices and are predicting a premium in certain sections soon. Locally, the trade is only fair, though domestic consumers have not stocked up much yet.

The Lake season is practically closed The December shipments are about as heavy as in any previous season, being 104,126 net tons. That the entire amount has been less than for the season of 1914 is only because unloading space has not been available, owing to the large amount left over last spring.

COLUMBUS

Steam business continues to improve. Domestic trade a trifle slow. Prices are generally well maintained.

The best feature of the trade is the increased demand for steam sizes in sympathy with the general expansion in manufacturing. Steel plants are buying well and railroads are taking a larger tonnage both for immediate use and for storage purposes. Shortage of cars is having its effect on the trade and many factories which formerly depended on West Virginia mines are looking to Ohio for steam grades. The car shortage is the most pronounced on West Virginia roads.

Domestic business is a trifle slow following a rush of orders due to the lower temperatures. Dealers have placed orders for immediate shipment and are going slow in taking on extra business. Retail prices have advanced; Pocahontas lump is now selling at $4.75 and Hocking lump at $3.50. Anthracite business is slowly increasing in central Ohio territory.

The Lake trade is now over and arrangements are being made for the coming year. Operators generally predict a better Lake trade in 1916 than in 1915. It is believed that the tonnage on the docks of the upper Lake ports will be used up completely during the winter leaving a deficiency, compared with the spring of 1915.

Prices in Ohio fields f.o.b. mines, per short tons are as follows:

	Hocking	Pomeroy	Eastern Ohio	Kanawha
Re-screened lump	$1.60	$1.65	.....	.....
Inch and a quarter	1.50	1.50	$1.35	$1.50
Three-quarter-inch	1.35	1.40	.....	1.35
Nut	1.25	1.30	.....	1.25
Mine-run	1.15	1.20	1.05	1.10
Nut, pea and slack	.90	.95	.80	.80
Coarse slack	.80	.85	.70	.70

CLEVELAND

Eastern demand seems to be affecting this region. Prices are unaccountably higher. The retail trade slowing up.

The trade here is having no difficulty getting all it needs, but fine coal prices are higher, due to the larger demand from the East and from the steel industry. The shutting off of Lake shipping has also curtailed the production of fine coal and this is felt distinctly. Operators have refused orders for coal for this district because of the higher market in other directions.

The retail trade is over the first rush, having taken in the initial fall orders, and is now waiting for the steady business that marks the winter, with now and then a spurt, due to cold weather. Ohio fine coals are coming into this market now; coarse grades are confined to Ohio coals and domestic sizes of smokeless. Youghiogheny does not come into this market very much, but jobbers are buying for out-of-town trade at quotations. The Pocahontas coarse coal market is weak, due to the fact that New England shipments are curtailed by a shortage of coastwise tonnage and operators are forced to sell where they can.

Jobbers are paying the following prices f.o.b. Cleveland per short ton:

	Pocahontas	Youghiogheny	Bergholz	Wainwright	No. 8
Freight	$1.45	$1.00	$0.70	$0.70	$0.90
Lump	3.25	.....	.....	....	....
Lump, 6 in.	....	.....	2.30	....	.....
Lump, 1¼ in.	....	2.30	2.10	2.30	2.05
Lump, ¾ in.	....	2.20	2.00	2.10	1.95
Lump, 3 in.	....	.....	.....	2.40	....
Egg	3.25	.....	.....	....	....
Mine run	2.70	2.15	1.90	1.95	1.90
Slack	....	2.00	1.90	1.90	1.90

TOLEDO

Domestic grades quiet but steam business active. Navigation closed.

The domestic market has been a little off owing largely to unfavorable weather conditions. There seems to be something of a surplus of this grade. Steam coal is generally strong so far as egg and slack is concerned. Lump is more of a drug on the market and Pocahontas lump is down to $2. Some of the dealers claim to be getting this price but there are some offerings as low as $1.80. Large steam consumers do not seem to be over supplied although all are carrying average stocks. The navigation season has officially closed but there are still a few boats moving, cleaning up the stocks on the local docks.

The Hocking Valley Railroad Co., it is announced is planning to spend $250,000 in extensions of its Toledo dock yard on the East Side. Millions are to be spent in double tracking this road between Toledo and Columbus. With the completion of a connecting link between the C. & O., and the Hocking in 1916, it is estimated that additional room will be needed as will also additional yard facilities at Walbridge.

DETROIT

Steam coal buying continues steady. Demand for domestic coal shows slight improvement. Anthracite quiet. Shippers pay higher rate for boats.

Bituminous—Regularity of orders, even though sales are not particularly large, is a steadying influence in the market. Small sizes are the most active and shortest in supply. Egg coal is the slowest size though there has been no reduction in price or large accumulation of stocks. The domestic market has improved due to the continued low temperatures. Car shortage appears more acute on certain Pennsylvania lines in Pennsylvania, than on any of the Ohio roads. Sales of consignment coal are now being made on practically the same basis as mines prices.

Anthracite—The trade is fairly active on chestnut. Some shippers have difficulty disposing of the larger sizes they are obliged to take in order to obtain enough chestnut for their needs.

Lake Trade—With only a few days of the navigation season remaining shippers are showing considerable anxiety to get boats. Rates of 75c. a ton are being paid on small cargoes. Some vessel owners are offering boats at a $1 rate but contracts have not been made and the expiration of the insurance limit at midnight, Dec. 12 leaves very few freighters available.

CINCINNATI

Improved sentiment, with better demand and firm prices. More cars and colder weather.

There is a more optimistic feeling in the trade though without any tangible improvement. More wintry weather has appeared resulting in greater strength on the domestic grades while the steam market has also been strong. Both nut and slack and mine-run have participated in the improvement. Slightly better car supply at the mines is also reported, the average supply now being about four days, as compared with three days and less a short time ago. The market will be stronger as the winter advances.

LOUISVILLE

Winter demand has greatly stimulated the domestic market. Operations at the mines are generally on a larger scale and the supply of labor will apparently prove equal to requirements. Steam coals are in continued good demand and reflect the improved industrial conditions. Prices show little if any change.

COKE

CONNELLSVILLE

Anxiety concerning supplies over the holidays causes a heavy buying movement and sharp advance in the prompt market. Production and shipments slightly increased.

Conditions in the pig-iron market make it certain that all furnaces capable of operating will be blown in, as pig iron prices have been advancing sharply, but the advances may be due chiefly to there being no means of increasing output, and hence there can be no material increase in coke consumption. With so many byproduct plants to be completed in the next six months the coke outlook is particularly blue since beehive coke will be correspondingly released.

Anxiety over the increasing car shortage and the possibility of interruptions over the holiday period created a spectacular advance in the coke market the early part of the week. Sales of prompt furnace coke have been made at $2.50, while rumors of a $3 figure were heard and prompt foundry coke sold as high as $3.75. We quote prompt furnace $2.50@3 and prompt foundry at $3.25@3.75; contract furnace, six months, $2.35@2.50; year, $2.25@2.35; contract foundry, $3@3.25, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Dec. 4 at 437,251 tons, an increase of 4,910 tons, and shipments at 439,165 tons, an increase of 4,081 tons.

Buffalo—The market is a trifle dull. There was a slight falling off in the price last week, caused by reaction from over-booming the trade. The market has recovered, probably on account of car shortage. The consumption appears to increase. Prices for this market, f.o.b., range from $5 to $5.20 for best 72-hr. Connellsville foundry and $4.30 for stock coke.

Chicago—The coke market is brisk with the demand for furnace and foundry sizes unabated. Byproduct domestic sizes are also in better demand. Prices per net ton, f.o.b. cars Chicago, are as follows: Byproduct, foundry, $5.25@5.75; byproduct, domestic, $4.75@4.95; Connellsville, $5.25@5.75; Wise County, $5.25@5.50; gas coke, $4@4.25.

St. Louis—Between domestic and industrial consumption, byproduct coke is enabled to maintain a fairly steady movement. Mild weather has checked sales for gas house. Very little demand for petroleum coke. The following prices prevail f.o.b. cars St. Louis: By-product (all sizes), $5; gas house (lump or egg), $4.25; petroleum, $6.25.

MIDDLE WESTERN

GENERAL REVIEW

Weather more seasonable. Steam coal buying continues in steady volume. Domestic demand below expectations. Screenings strong.

Developments of the past week have shown pronounced evidence of strength in steam coals and screenings, while domestic buying has slacked off owing to lack of snappy cold weather. Retailers complain that buying by the public is still in small lots, with little disposition to put in reserve stocks. Some concessions in spots have been made on coarse domestic sizes, but on the whole list prices are well supported. The domestic trade is fair but not up to expectations, though the steam sizes are bullish at higher prices.

Fine coal is likely to continue at maximum prices unless severe wintry weather prevails for an appreciable period. Many operators and wholesalers refuse to quote on fine coal, and open shipments are sold quickly at high prices; it is felt that many industrial plants will have to pay higher prices than for a number of years. Operators are holding coarse coals at the mines rather than rush shipments into the markets to be sacrificed at low prices. The smokeless market is still feeling the effects of the recent sacrifice of several hundred cars of smokeless lump and egg at mine-run prices; this is about the only real weak feature of the situation. The expected improvement in the car supply due to the release of the equipment used for lake cargoes, has hardly had enough time to materialize, though it is noticeable that supply is easier.

INDIANAPOLIS

Indiana mines on full schedule, due to demand from railroads and industrial plants. Screenings prices higher. Weather still unfavorable to domestic trade. Car situation satisfactory.

Indiana has had no real winter weather as yet but most of the mines are making full time, due chiefly to the buying of railroads and industrial plants, many of which are stocking earlier than usual in preparation for the biennial wage conference. Screenings have strengthened and are commanding 85c. in the open market for Nos. 5 and 6. The larger companies say they have very little to offer in their home territory. No. 4 1¼-in. steam coal sells at $1.40 f.o.b. mine and domestic lump at $1.50 for Nos. 5 and 6 and $1.65 for No. 4. Many of the industrial plants, particularly steel concerns have sold far ahead and are taking no chances on their coal supply, which accounts for the large orders. The weather is against an active retail trade, but dealers are not complaining.

CHICAGO

Smokeless coals still demoralized. Screenings advancing. Coarse steam shipments heavy. Anthracite quiet.

Orders for Franklin County domestic sizes have been arriving in better volume lately. Williamson County coal is moving slowly, but at good prices, mostly to Northern points, shipments to the South having fallen off slightly. Screenings are in stronger demand, and No. 2 nut is taken freely. Fine coal is strong at about 80c. with future shipments quoted at 85c. Saline domestic lump, egg and No. 1 nut are easy.

Springfield domestic lump has been easy, but no sales are reported at less than $1.65. The demand for Springfield screenings from the Chicago district has been unusually heavy the past week. Egg coal seems to be in better demand than lump.

Railroads are stocking increased quantities of Indiana 1¼-in. steam lump. Less than the usual volume of Indiana coal is moving to Chicago. The demand for steam coals seems to come chiefly from Indiana factory towns. Mines are operating every day, screenings are scarce and domestic-lump business is good.

Smokeless is still in a poor position because of the recent dumping of a heavy tonnage of consignment coal in the Chicago market. Prepared sizes have sold as low as $1.65, and some mine-run has been sacrificed below $1.25; $2 on lump and egg, and $1.75 on nut in flat bottoms, with prices 15c. lower on hopper shipments are claimed to be the established prices at this time. Stocks of West Virginia smokeless coal are at the maximum, and the outlook is not promising. The situation is due to the closing of navigation, which caused an abnormal amount of Lake smokeless to be thrown into the Chicago market by rail at an unpropitious time, though it is thought that all this surplus coal has now been absorbed. Pennsylvania smokeless was but little affected by this state of affairs. Splint shows no life because prices continue too high to make shipments into this territory attractive.

A slight improvement is shown in the demand for anthracite, and orders for chestnut the last few days have reached Chicago in increasing volume. In many Illinois cities coke is now becoming the formidable competitor of anthracite. The increasing use of coke is causing many retail dealers to question the continued use of heavy coal-lifting machinery because of the light weight of coke as compared with anthracite.

Quotations in the Chicago market are as follows, per net ton f.o.b. mines:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump	$1.60@1.75	$1.60@1.75	$1.50@1.65	$1.40@1.60	$1.40@1.60
Steam lump	....	1.25@1.35	1.20@1.35	1.15@1.25	1.10@1.25
2½ and 3-in. lump	....	....	1.40@1.50	....	1.30@1.45
1¼-in. lump	....	....	1.25@1.35	1.20@1.30	....
Egg	1.60@1.75	1.50@1.60	1.15@1.25	1.10@1.25	1.15@1.25
Nut	....	1.60@1.65	.95@1.05	1.00@1.10	1.00@1.10
No. 1 washed	1.65@1.75	....	1.50	....	....
No. 2 washed	1.40@1.50	....	1.40	....	....
No. 1 nut	1.65@1.75	....	....	....	....
No. 2 nut	1.50	....	....	....	....
Mine-run	1.10@1.15	1.05@1.10	.85@1.00	.95@1.05	.85@1.05
Screenings	.75@ .85	.70@ .75	.70@ .85	65@ .75	.75@ .85

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.65@1.75	$1.60@2.40	$1.40@2.25	$1.75@2.00	$1.75@1.85
1¼-in. lump	1.30@1.40	....	....	....	1.50@1.60
Egg	1.60@1.75	1.35@2.00	1.40@2.25	1.70@2.00	1.00@1.10
Nut	....	1.25@1.60	1.40@1.75	1.40@1.60	....
No. 1 nut	1.60@1.75	....	....	....	....
No. 2 nut	1.40@1.50	....	....	....	....
Mine-run	1.15	....	1.10@1.40	1.25@1.40	1.15@1.25
Screenings	70@ .80	.70@ .80	....	....	.75@ .90

ST. LOUIS

Screenings advance still further. Standard grades slightly stronger.

Screenings advanced another notch during the past week. Franklin and Williamson County screenings which were around 65 to 70c. are now strong at 75c. Standard and Staunton, which ranged last week from 55 to 60c. are now from 60 to 65c. The Standard list is a trifle stronger in almost all grades, but there is little movement of lump. The industrial situation is about the same.

Quotations f.o.b. mines are on the following basis per short ton:

	Frnk. Co.	Wlmson. Co.	Staunton	Standard
6-in. lump	$1.50@1.65	$1.50@1.65	$1.25	$1.15@1.25
8-in. lump	....	....	....	1.15@1.25
2-in. lump	....	....	1.15	1.00
3x6 egg	1.40@1.65	1.40@1.65	....	.95
2x6 egg	....	....	....	.85
No. 1 nut	1.50@1.75	1.50@1.75	....	.85
No. 2 nut	1.25@1.50	1.25@1.50	....	.85
No. 1 washed	....	1.40@1.50	1.40@1.50	....
No. 2 washed	....	1.25@1.40	1.25@1.40	....
No. 3 washed	....	1.15@1.25	1.15@1.25	....
No. 4 washed	....	1.15@1.25	1.15@1.25	....
No. 5 washed	....	.75	.75	....
Screenings	.75	.75	.60@.65	.60@.65

Freight Rates—Inner group, St. Louis, 57½c., East St. Louis, 37½c. Outer group, St. Louis, 72½c.; East St. Louis, 57½c.

DULUTH

Mild weather affects the trade. Only a fair amount of coal moving. Prices firm. Lake shipping practically over.

The absence of any really cold weather caused a rather sluggish movement on all the prepared sizes of bituminous coal. Hand-to-mouth buying prevails to a large extent. Very little coal was received during the week, many of the boats having been laid up for the winter and navigation is now practically over. Prices remain very firm, no deviation from circular being reported. Quotations per short ton, f.o.b. cars at Duluth docks are as follows:

	Yough	Splint	Hock	Smokeless	Elkhorn
Lump	$3.40	$3.40	$3.40	$4.75	$3.75
Dock run	3.10	3.10	3.10	3.25	3.25
Egg, stove and nut	3.40	3.40	3.40	4.75	3.65
Screenings	2.40	2.40	2.25	2.[illegible]	2.55

There has been very little life to the anthracite trade due to the extremely mild weather, and the trade is anxiously awaiting a drop in the temperature that will undoubtedly create an influx of orders. Prices are as follows per short ton f.o.b. docks: Nut, $7.10, stove and egg, $6.85, pea $5.55 and buckwheat, $4.

KANSAS CITY

Steam demand is somewhat heavier and colder weather has quickened the domestic trade. Selling has been heavier than for some time past and mines in the Missouri, Kansas, Oklahoma, and Arkansas fields are working steadily. No increases have been asked, although some mine owners have been forced to go into the open market to obtain supplies. A tendency is noted among concerns using fuel oil to change back to coal as a result of the present high prices that have greatly forced up fuel oil.

PRODUCTION AND TRANSPORTATION STATISTICS

ANTHRACITE SHIPMENTS

The shipments of anthracite for November 1915 as reported amounted to 6,297,215 long tons, which establishes a new record for November shipments for the region. The largest previous November shipments were in 1911, when 6,193,314 tons were sent to market. The largest shipments in any one month were in October 1912, when they totaled 6,665,321 tons. These figures were closely approached by the shipments of October 1914, which amounted to 6,664,476 tons. Compared with November 1914 the shipments last month showed an increase of 368,929 tons, and compared with October of this year they exhibit a decrease of 208,677 tons.

TIDEWATER STOCKS

	Tons		Tons
Port Reading	44,040	Port Johnson	21,954
Port Richmond	153,970	South Amboy	306,058
Greenwich	8,006	Perth Amboy	53,868
Canton Piers	3,315		
Elizabethport	19,450	Total	610,661

Shipments for November and the first ten months of 1914-15 were as follows:

	November		10 Months	
	1915	1914	1915	1914
Phila. & Reading	1,163,851	1,082,344	10,358,940	11,043,952
Lehigh Valley	1,190,103	1,139,467	11,904,105	12,081,410
Cent. R.R. of N.J	762,140	761,897	7,294,834	8,214,332
Del. Lack. & West	971,389	881,645	8,651,189	9,010,438
Del. & Hudson	694,386	638,892	7,365,989	6,671,589
Pennsylvania	616,190	595,819	5,487,151	5,904,737
Erie	696,890	622,154	7,221,557	7,565,548
Ont. & Western	202,266	206,068	1,898,453	2,148,337
	6,297,215	5,928,286	60,182,218	62,640,343

NORFOLK & WESTERN RY.

The following is a statement of coal handled by the N. & W. Ry. during November and the past four months in short tons:

	August	September	October	November
Pocahontas Field	1,721,578	1,620,862	1,720,613	1,482,015
Tug River District	337,585	354,981	375,743	339,154
Thacker District	227,312	230,198	264,619	268,299
Kenova District	80,152	89,921	95,438	92,587
Clinch Valley District	151,804	144,234	142,187	118,553
Other N. & W. Territory	4,239	3,798	4,636	5,277
Total N. & W. Fields	2,522,665	2,443,494	2,603,236	2,305,885
Williamson & Pond Creek	89,785	87,152	95,188	90,052
Tug River & Ky. R.R.	....	....	60,050	57,039
All other railroads	348,124	324,913	268,762	245,730
Grand total	2,960,574	2,855,559	3,027,236	2,698,706

IMPORTS AND EXPORTS

The following is a comparative statement of coal imports and exports of the United States for September, 1914-15, and for the nine months ending September, 1913-14-15, in long tons:

	September		Nine Months		
Imports:	1914	1915	1913	1914	1915
Anthracite, total	2,355	134	836	18,257	2,524
Bituminous, total	128,771	126,282	1,035,887	990,284	1,077,799
United Kingdom	102	500	4,597	8,410	16,110
Canada	101,646	111,000	828,013	771,158	869,634
Japan	90	5,200	79,075	44,539	62,119
Australia	26,933	9,578	121,386	164,124	127,356
Other countries	....	4	2,816	2,053	2,580
Coke	16,977	2,982	58,838	83,980	36,602
Exports					
Anthracite total	395,088	289,790	3,173,002	3,062,057	2,594,754
Canada	389,213	276,583	3,119,522	3,017,158	2,538,305
Argentina	....	134	....	....	2,469
Brazil	6	....	....	6	2,415
Uruguay	....	....	....	....	605
Other countries	5,869	13,073	53,480	44,893	50,900
Bituminous total	1,857,520	1,832,977	13,793,963	10,902,780	12,421,500
Italy	....	324,925	....	....	2,348,870
Canada	1,202,930	944,800	10,283,998	7,241,856	5,682,455
Panama	23,166	59,969	387,582	214,131	389,419
Mexico	42,312	21,787	397,753	257,380	238,033
Cuba	97,787	109,269	983,392	793,898	843,805
West Indies	64,099	44,835	464,645	479,923	353,440
Argentina	55,567	56,305	55,877	193,786	719,019
Brazil	45,846	61,223	211,045	201,071	544,194
Uruguay	4,929	4,275	5,163	61,443	135,065
Other countries	320,884	205,589	1,004,508	1,459,292	1,167,260
Total coal	2,252,608	2,122,767	16,966,965	13,964,837	15,016,314
Coke	673,372	651,788	5,763,584	5,711,948	5,678,815
Bunker coal	28,510	59,395	662,863	485,171	573,084

LAKE SHIPMENTS

Anthracite shipments through the Sault Ste. Marie Canal for November amounted to 233,708 tons, and bituminous was 1,343,248.

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

✚Indicates contracts regarding which official information has been received.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

1598—New Orleans, La.—Bids have been received on this contract (pp. 736, 957), which provides for furnishing the Public Belt Railroad Commission with approximately 8,000 tons of coal, as follows:

Company	Coal	Price per Ton
W. G. Coyle & Co.	Sipsey egg	$3.15
W. G. Coyle & Co.	Sipsey washed nut	2.85
West Kentucky Coal Co.	Mine-run	2.57½
Warrior Black Creek Co.	Screened lump	3.05
Warrior Black Creek Co.	Washed pea and slack	2.75
Andrews Coal Co.	Engine lump[1]	2.50
Robt. P. Hyams Coal Co.	Pratt	2.72
Robt. P. Hyams Coal Co.	Pratt mine-run[2]	2.93
J. W. Allen & Co.	Majestic[3]	2.90
Mabel Mining Co.	Mine-run	2.75
Tenn. Coal, Iron & R.R. Co.	Washed steam nut	2.90
Rodin Coal Co.	6-in. washed[4]	2.85
Rodin Coal Co.	4-in. washed[4]	2.75
New Orleans Coal Co.	Pratt[4]	2.70
New Orleans Coal Co.	Washed nut and slack	2.60
Corona Coal and Iron Co.	No. 2 lump	2.65
Corona Coal and Iron Co.	Locomotive nut	2.60
El Dorado Coal Co.	Pratt[4]	2.55

[1] Jagger Creek. [2] From Dixiana, Ala. [3] Black Creek washed. [4] Mine-run.

Address Secy. F. H. Joubert, Public Belt Railroad Com., Municipal Bldg., New Orleans, La.

1603—Krumroy Station, Ohio—Awards on this contract (p. 737), which provides for furnishing the Springfield Lake Sanitorium with approximately 15,000 tons of coal, will not be made until Jan. 1. Address Secy. F. L. Allen, Bd. of Trustees, Springfield Lake Sanitorium, Canton, Ohio.

1622—Spokane, Wash.—There were only two bids submitted on this contract (p. 787), which provides for furnishing the City Government with coal. The Diamond Ice and Fuel Co. bid $4.75 per ton for Carbondale slack and $5.45 per ton for mine-run, while the Crows Nest Pass Co. bid $4.80 on slack and $5.35 for mine-run. The contract involves approximately 600 tons for use at the various city institutions. It is understood that there is considerable controversy over the contract, and no award has as yet been made. Address Purchasing Agent, City of Spokane, Spokane, Wash.

1677—Chicago, Ill.—No awards have as yet been made on this contract (p. 912), which provides for furnishing the City Pumping Station with coal during the ensuing year, and it is now understood that the city will continue taking coal on the old contract for the next three months, provision for such an extension being embodied in that agreement. Address Comr. of Pub. Works L. E. McGann, Room 406, City Hall, Chicago, Ill.

1718—Robesonia, Penn.—The distribution of requirements on this contract (p. 998), which covers the purchases of the Robesonia Iron Co., are as follows, per annum: At the Robesonia, 2,400 tons of bituminous, 1,500 tons of anthracite and 60,000 tons of furnace coke; at Miners Village, 2,400 tons of bituminous. Address Supt. S. B. Patterson, Robesonia, Penn.

New Business

Volume and page number in parentnesis at the end of an item indicate where the previous announcement, bids and awards on that contract may be found.

1747—New York, N. Y.—Bids will be received until 2 p.m. Dec. 20, for furnishing and delivering approximately 3,000,000 lb. of buckwheat No. 2, and 500,000 lb. of egg coal alongside of dock at the Asphalt Plant between 90th and 91st St. and East River. The contract is to expire on Apr. 1. Address Commissioner of Public Works, Room 2032, Municipal Bldg., New York, N. Y. (No. 605, Vol. 7, pp. 795, 918.)

1748—Mansfield, Ohio—The Mansfield Sheet and Tin Plate Co. is in the market for its annual fuel requirements, involving approximately 30,000 tons of Ohio ¾-in. steam coal. Deliveries are made by B. & O. R.R. Address Pres. W. H. Davey, the Mansfield Sheet and Tin Plate Co., Mansfield, Ohio.

1749—Mt. Vernon, Ill.—The Citizens Gas, Electric and Heating Co. is receiving bids for furnishing its fuel requirements, involving from 400 to 500 tons of 3-in. screening per month. Address Pur. Agt., H. A. Lomire, The Citizens Gas, Electric and Heating Co., Mt. Vernon, Ill.

1750—Urbana, Ohio—The United Paper Board Co. is receiving bids for a prompt shipment of 15 cars of nut and slack coal. Address Cashier R. R. Owen, United Paper Board Co., Urbana, Ohio.

1751—Chelsea, Mass.—The Revere Rubber Co. at this place usually contracts for its annual fuel requirements involving approximately 15,000 tons of New River mine-run coal in February. Deliveries are made by wagon at the rate of approximately 50 tons per day and the coal is bought under a guarantee of 14,500 b.t.u. The company has a storage capacity for 2,200 tons. Address Mgr. E. H. Scribner, Revere Rubber Co., Eastern Ave., Chelsea, Mass.

1752—Kalamazoo, Mich.—Chase & Woodruff are in the market for between 1,200 and 1,500 tons of West Virginia splint, nut and slack coal for prompt delivery. Address Pur. Agt. E. W. Chase, Chase & Woodruff, Kalamazoo, Mich.

1753—Lisbon, Ohio—The Board of Public Affairs will receive bids until 7 p.m. Dec. 15, for furnishing coal as may be required for the local Water-Works during the ensuing year. Bids were requested on mine-run, slack, and nut from Nos. 3 and 6 and from Pittsburgh vein coal. Quotations should be made f.o.b. switch at the Water-Works plant and a certified check for $50 must accompany each bid. Address Clk. W. E. Ferrall, Bd. of Pub. Affairs, Lisbon, Ohio.

1754—Philadelphia, Penn.—The Vulcanite Portland Cement Co. usually contracts for its annual fuel requirements involving between 25,000 and 50,000 tons of mine-run steam coal, and 50,000 to 75,000 tons of gas slack some time in January. The company has a storage capacity for 10,000 tons and deliveries are made by railroad. Address Purchasing Agent, Vulcanite Portland Cement Co., Land Title Bldg., Philadelphia, Penn.

1755—St. Louis, Mo.—The United States Engineering Department will receive bids until 11 a.m. Dec. 29, for furnishing the department with approximately 30,000 tons of coal during the ensuing year. Complete information may be had on application. Address United States Engineer Office, Custom House, St. Louis, Mo. (No. 26, Vol. 6, p. 972.)

1756—Delphos, Ohio—The Delphos Gas Co. is receiving bids on its annual fuel contract involving approximately 600 tons of ¾-in. gas lump or egg coal. Address Pur. Agt. W. M. Moran, the Delphos Gas Co., Delphos, Ohio.

1757—Hattiesburg, Miss.—The Hattiesburg Trading Co. usually contracts for its annual fuel requirements involving approximately 6,000 tons of Kentucky pea and slack and 1,200 tons of No. 2 lump gas coal some time in January. Deliveries are made by rail at the rate of about 600 tons per month and the company has a storage capacity for 800 tons. Address Pur. Agt. H. F. Wheeler, Hattiesburg Trading Co., Hattiesburg, Miss.

1758—Hanover, Ont., Can.—The Hanover Portland Cement Co., Ltd., usually contracts for its annual fuel requirements involving from 12,000 to 15,000 tons of slack, 500 to 1,000 tons of three-quarter lump and 1,000 tons of nut and slack coal some time in January. Deliveries are made by G. T. R.R. via bridge at the rate of about 300 tons per week. Address Pur. Agt. E. D. Greutzner, Hanover Portland Cement Co., Ltd., Hanover, Ont., Can.

1759—Mt. Vernon, Ill.—The Mt. Vernon Car Manufacturing Co. is in the market for its annual fuel requirements comprising screenings and mine-run coal. Address Pur. Agt. Webber, Mt. Vernon Car Manufacturnig Co., Mt. Vernon, Ill.

1760—Cambridge, Mass.—The Cambridge Gas Light Co. usually contracts for its annual fuel requirements some time in January. Mine-run bituminous coal is required. Address Purchasing Agent, Cambridge Gas Light Co., Cambridge, Mass.

1761—Van Wert, Ohio—Bids will be received until noon Dec. 18 for furnishing the local Water-Works Department with coal as may be required during the ensuing year. Deliveries are to be made in carload lots in the bins at the pumping station. A certified check for $50 must accompany each bid and a satisfactory bond will be required from the successful bidder. Address Dir. W. T. Backus, Pub. Service, Van Wert, Ohio.

1762—Columbus, Ga.—Shepherd Brothers at this place usually contract for its annual fuel requirements involving from 5,000 to 6,000 tons of washed steam coal some time in February. The company has storage capacity for 12 cars and deliveries are made by railroad at the rate of about two cars per week. Address Purchasing Agent, Shepherd Brothers, Fifth St. and 10th Ave., Columbus, Ga.

1763—St. Louis, Mo.—The Hamilton Brown Shoe Co. is in the market for the fuel requirements at its Columbia factory, involving approximately 300 tons per month of 2-in. lump coal. Address Purchasing Agent, the Hamilton Brown Shoe Co., St. Louis, Mo.

1764—New York, N. Y.—Bids will be received until noon Dec. 21, for furnishing and delivering 170 tons of range coal as needed to County Clerk's Office and Court House, Richmond; Village Halls at Stapleton and New Brighton; Field Office at St. George and Coroner's Office, New Brighton, and Old Corn Exchange Bank Building, St. George; 565 tons of buckwheat No. 1 to Borough Hall, St. George, to be delivered in 150-ton lots. The range coal is to be delivered in 2- and 5-ton lots. The contract is to be completed during the year beginning Jan. 1. Address Pres. Calvin D. Van Name, Room 18, Borough Hall, New Brighton, Staten Island.

1765—New Orleans, La.—The G. H. Leidenheimer Baking Co. is now in the market for its annual fuel requirements, involving approximately 700 tons of coal. Address G. H. Leidenheimer, G. H. Leidenheimer Baking Co., 1500 S. Franklin St., New Orleans, La.

1766—Philadelphia, Penn.—The Link-Belt Co. is accepting tenders for its annual requirements of buckwheat and rice coal, involving approximately 1,500 tons. The contract becomes effective Jan. 1. Address Purchasing Agent, Link-Belt Co., Nicetown, Philadelphia, Penn.

1767—Camden, N. J.—The Southwark Manufacturing Co. is negotiating for its annual fuel supply, involving approximately 2,500 tons of pea coal. The contract is to run for one year from Jan. 1. Address Secretary Southwark Manufacturing Co., foot of Winslow St., Camden, N. J.

1768—New Orleans, La.—The Pelican Cold Storage and Warehouse Co. is in the market for its annual coal requirements, and will enter a contract shortly. Address Purchasing Agent, Pelican Cold Storage and Warehouse Co., 1561 St. Louis St., New Orleans, La.

1769—New Castle, Del.—The Baldt Steel Co. is in the market for its annual supply of broken coal, involving approximately 1,700 tons. Deliveries are to be made during the year beginning Jan. 1. Address Pur. Agt. G. A. Pederick, Baldt Steel Co., New Castle, Del.

1770—Philadelphia, Penn.—C. O. Struse & Sons, brick manufacturer is in the market for its annual supply of broken coal, involving approximately 2,000 tons, deliveries to be made during the year beginning Jan. 1. Address Purchasing Agent, C. O. Struse & Sons, Manayunk, Philadelphia, Penn.

1771—New Orleans, La.—The Ruddock-Orleans Cypress Co. is in the market for its annual fuel requirements, involving 50 to 60 cars of bituminous coal. Address Purchasing Agent, Ruddock-Orleans Cypress Co., Carrollton Ave. and New Basin, New Orleans, La.

1772—Warrensville, Ohio—The contract for furnishing the Correction Farm at this place, which is usually negotiated at about this time, is being delayed, due to plans that are under consideration for using gas when the current coal contract expires. It is understood on good authority that the administration at the farm will be changed Jan. 1, and in which event it is possible the new officials may reconsider this proposed change. Address Director of Public Welfare, City Hall, Cleveland, Ohio. (No. 57, Vol. 6, p. 189.)

1773—Cheltenham, Penn.—The Ames Shovel and Tool Co. is in the market for its annual supply of buckwheat coal, involving approximately 1,500 tons, to be delivered during the year beginning Jan. 1. Address Purchasing Agent, The Ames Shovel and Tool Co., Cheltenham, Penn.

1774—New Orleans, La.—The American Laundry Co. at this place will be in the market about Jan. 1, for their annual fuel requirements, involving approximately 25,000 tons. Address Pres. Chas. O'Connor, American Laundry Co., Julia and Magazine St., New Orleans, La.

1775—Chester, Penn.—The Crozier Home and Hospital will contract some time during the current month for its annual fuel supply, involving approximately 600 tons of anthracite pea coal. Address Secy. S. K. Ubill, Crozier Home and Hospital, Chester, Penn.

1776—New Orleans, La.—It is reported that the Union Brewing Co. at this place will negotiate its annual fuel contract some time before Jan. 1. Address Purchasing Agent, Union Brewing Co., 2809 N. Robertson St., New Orleans, La.

✚1777—Pittsburgh, Penn.—Bids will be received until noon, Dec. 24, for furnishing the Western Penitentiary of Pennsylvania with coal as may be required at the Pittsburgh Prison, North Side, during the year beginning Jan. 1. Complete specifications and proposal forms may be obtained on application. Address Warden John Francis, Western Penitentiary, Pittsburgh, Penn. (No. 1,578, Vol. 8, p. 700.)

1778—Camden, N. J.—Bids will be received until 8 p.m., Dec. 22, for furnishing the local Water Department with approximately 4,500 gross tons of bituminous coal. All bids should be made f.o.b. cars, Morris Station, N. J., and analysis must accompany each proposal. The coal must be equal to Logan No. 1, or Thorne, Neale & Co.'s Sonman Shaft, South Fork, Miller Vein coal. Each proposal must be accompanied by a certified check for $300. Address Chn. Charles H. Greer, Water Com., Room 11, City Hall, Camden, N. J.

1779—Philadelphia, Penn.—Horrocks & Bro. will contract for their annual supply of buckwheat, involving approximately 3,500 tons, some time during the current month. Deliveries are to be made during the year beginning Jan. 1. Address Purchasing Agent, Horrocks & Bro., Frankford, Philadelphia, Penn.

1780—New Orleans, La.—It is understood that the New Orleans Brewing Co. will soon negotiate a contract for their annual coal supply. Address Purchasing Agent, New Orleans Brewing Co., Jackson and Tchoupitoulas St., New Orleans, La.

1781—Philadelphia, Penn.—The Arnholt & Schaefer Brewing Co. is receiving tenders for its annual fuel supply, involving approximately 2,000 tons of buckwheat and rice coal. Address Purchasing Agent, Arnholt & Schaefer Brewing Co., 31st and Thompson St., Philadelphia, Penn.

1782—New Orleans, La.—The Pelican Cracker Factory will contract for its annual fuel requirements, involving approximately 175 tons of bituminous coal and 50 tons of coke about Jan. 1. Address Pur. Agt. E. L. Gerde, Pelican Cracker Factory, 816 Magazine St., New Orleans, La.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

1428—Unionville, Mo.—The contract for furnishing the local Municipal Light and Water Works with coal during the year beginning Dec. 1 (p. 489), has been awarded to the **Iowa Block Coal Co.**, of Exline, Iowa, at $1.35 per ton in the bin at Unionville. The Thistle Coal Co., of Cincinnati, was the next bidder at $1.45 per ton. Address Supt. M. T. Lynn, Municipal Light and Water Works, Unionville, Mo.

1480—Massillon, Ohio—This contract (p. 576), which provides for furnishing the local Public Schools with coal as may be required during the ensuing year, has been awarded to the **Artificial Ice and Coal Co.**, on Goshen coal at the following prices, delivered: Lump, $2.28; mine-run, $1.99; slack, $1.65. Address Clk. Wm. Fielberth, Bd. of Education, Massillon, Ohio.

1534—Washington, D. C.—This contract (p. 616), which provides for furnishing the United States Senate with a small tonnage of anthracite coal, has been awarded to **W. H. Marlow & Co.**, on the following basis: Egg, $6.45; stove, $6.95; chestnut, $7.05. Address Sargeant-at-Arms Charles P. Higgins, U. S. Senate, Washington, D. C.

1601—Cameron, Mo.—This contract (p. 736), which provides for furnishing the local Municipal Light and Water Plant with approximately 3,000 tons of coal, has been awarded to **S. L. Evans** at $1.60 per ton for Novinger nut coal, and $2.20 for mine-run, f.o.b. Cameron. Kindig & Gage bid $1.30 for nut and $2.05 for mine-run. Address Clk. Clarence Staples, Cameron, Mo.

1611—Williston, N. D.—This contract (p. 786), which provides for furnishing coal as may be required at the local Court House and Jail during the ensuing year, has been awarded to the **North Western Fuel Co.** on North Dakota lignite coal at $2.45 per ton. Address County Audr. M. H. Aaen, Williston, N. D.

1671—Grand Haven, Mich.—This contract (p. 912), which provides for furnishing the Eagle-Ottawa Leather Co. with approximately 4,000 tons of West Virginia mine-run coal for use at their Grand Haven and Whitehall plants, has been awarded to the **Wyatt Coal Co.** Address B. Peter, The Eagle-Ottawa Leather Co., Grand Haven, Mich.

1672—Madison, Ill.—This contract (p. 912), which provides for furnishing the fuel requirements of the Barber Asphalt

Paving Co., involving about 30 tons per day, has been awarded to the **Mt. Olive & Staunton Coal Co.** The contract expires on Apr. 1 next. Address Pur. Agt. White, Barber Asphalt Paving Co., Madison, Ill. (No. 494, Vol. 7, p. 665.)

1683—Bozeman, Mont—This contract (p. 912), which provides for furnishing the County Board of Commissioners with approximately 100 tons of coal, has been awarded to **J. C. McCarthy,** on Fromberg coal at $4.85 per ton. Other bids were: George Hoover, Bear Creek, $5.35; Kooi, $4.90; Kenyon-Noble Lumber Co., Red Lodge or Bear Creek, $5.25; Fransham Coal Co., $5. Address Clk. E. H. Schumacher, Gallatin County, Bozeman, Mont.

1688—San Antonio, Tex.—This contract (p. 957), which provides for furnishing the St. Anthony Hotel with approximately 40 tons of lignite coal per month, has been awarded to the **Phelon Coal Co.** at $1.75 per ton for lignite coal, delivered in the bins. Address Ch. Engr. Orr, St. Anthony Hotel, San Antonio, Tex.

1699—Columbus Grove, Ohio—This contract (p. 958), which provides for furnishing the Columbus Grove Water-Works with approximately 2,000 tons of coal during the year, beginning Dec. 1, was awarded to the **Sauters Coal Co.** on its Pittsburgh No. 8 Gaylord three-quarter lump coal at $1.10 per ton, f.o.b. mines. Address Clerk Board of Public Works, Columbus, Ohio

1707—Jefferson, Wis.—This contract (p. 958), which provides for furnishing the local Board of Education with approximately 150 tons of West Virginia splint, dock screened coal, to be delivered at the High School and Public Library, has been awarded to the **N. J. Braun Lumber Co.** at $4.50. George Traeger bid $4.49, Fernholy Lumber Co. $4.70, and the Jefferson Brick and Tile Co., $4.80. Address Chn. S. E. Waterbury, Bd. of Edu., Jefferson, Wis.

1710—Cleveland, Ohio—This contract (p. 958), involving a prompt purchase of 200 cars of nut and slack coal, was awarded to the **Bertha Coal Co.** of Pittsburgh, on Pittsburgh coal at $1.95 per ton, f.o.b. Cleveland, Ohio. There were 20 other bidders on this business. Address T. P. Jones, Fuel Agent, Cleveland, Ohio.

1728—Cambridge, Mass.—This contract (p. 999), which provides for furnishing the Cambridge Water Board with approximately 1,000 long tons of coal during the next six months, has been awarded to Coleman Bros. at $4.85 per ton. Address Gen. Supt. Edward W. Quinn, Cambridge Water Works, Cambridge, Mass.

Contract Notes

East St. Louis, Ill.—The Fred Callaghan Coal Co. has contracted with the **Lumaghi Coal Co.** for 200 tons per month of "Cantine" 6-in. lump.

St. Louis, Mo.—The Avery Coal and Mining Co. has concluded a contract to market the output of the Mulberry Hill mine in the Belleville district.

St. Louis, Mo.—The Breese Trenton Coal and Mining Co. has sub-let a portion of its contract with the Terminal Railroad Association to the Kolb Coal Co.

East Indies—An American consular officer in this district reports shortage of coal, and submits the names and addresses of a number of local consumers.

Danielson, Conn.—The Danielson & Plainfield Gas and Electric Co. consumes about 4,000 tons of bituminous coal per annum, which costs approximately $4.25 per ton.

St. Louis, Mo.—The Heinecke Coal Co. has contracted with the **Consolidated Coal Co.** for approximately 600 tons per month of Mt. Olive lump coal, contract to expire Apr. 1.

Madison, Ill.—The Kettle River Co. has contracted with the **Kolb Coal Co.** for approximately 600 tons of "Mascoutah" 2-in. lump coal per month. Address Pur. Agt. H. Gilliam, The Kettle River Co., Madison, Ill.

Madison, Ill.—Kosta & Co. have contracted with the **Heinecke Coal Co.** to cover their requirements until Apr. 1. They will take about 400 tons per month of Worden lump coal. Address Pur. Agt. Kosta, Kosta & Co., Madison, Ill.

Delphos, Ohio—The Delphos Electric Co. is understood to have closed its contract, involving approximately 1,500 tons of West Virginia mine-run at 65c. at the mines. Address Supt. C. K. Beilharz, The Delphos Electric Co., Delphos, Ohio.

Fall River, Mass.—The Arkwright Mills at this place consume approximately 6,000 tons of Pocahontas coal which is delivered by wagon. The company does not contract. Address Treas. Herbert H. Marble, The Arkwright Mills, Fall River, Mass.

St. Louis, Mo.—The Crunden-Martin Woodenware Co. has contracted with the **Peabody Coal Co.** for approximately 200 tons of Hillsboro 2-in. lump coal per month. Address Pur. Agt. Wm. M. Crunden, The Crunden-Martin Woodenware Co., St. Louis, Mo.

Granite City, Ill.—The Granite City Lime and Cement Co. has contracted with the **Lumaghi Coal Co.** for approximately 600 tons of "Cantine" 6-in. lump coal per month. Address Pres. C. W. Eisenmayer, The Granite City Lime and Cement Co., Granite City, Ill.

Bessemer City, N. C.—The Atlas Mfg. Co. at this place consumes about 50 tons of mine-run coal per week. The company has storage capacity for five cars, and deliveries are made by railroad. Address Pur. Agt. A. A. McLean, Jr., Atlas Mfg. Co., Bessemer City, N. C.

New Orleans, La.—The No. 3 plant of the Dixie Ice Manufacturing Co. consumes about 450 tons of lump coal per month which is being bought in the open market at the present time. Address Chf. Engr. J. A. Lamar, The Dixie Ice Manufacturing Co., New Orleans, La.

St. Louis, Mo.—The City Coal Co. has awarded the **Lumaghi Coal Co.** a contract for approximately 1,600 tons per month of "Cantine" lump, and 800 tons of "Black Brier" lump, the contract to expire Apr. 1. Address Secy. and Pur. Agt., P. A. Riley, City Coal Co., St. Louis, Mo.

St. Louis, Mo.—The Union Seed and Fertiliizer Co. will confine their purchases, involving approximately 500 tons of 1½-in. or 2-in. screenings per month to the open market during the balance of this season. Address Pur. Agt. McCullough, The Union Seed and Fertilizer Co., St. Louis, Mo.

St. Louis, Mo.—The contract for furnishing the National Utilization Co. with approximately 200 tons of 2-in. lump and 2-in. screened nut per month, has been awarded to the **Lumaghi Coal Co.** on their "Cantine" coal. Address Gen. Mgr. and Pur. Agt. P. A. Doyle, National Utilization Co., St. Louis, Mo.

St. Louis, Mo.—The contract from furnishing the St. Louis Basket and Box Co. with their annual fuel requirements, involving approximately 400 tons per month at both plants, has been awarded to the **Schroeter Coal Co.** on Breese 2-in. screened lump. Address Pur. Agt. Lehman, St. Louis Basket and Box Co., St. Louis, Mo.

St. Louis, Mo.—The John Reenan Coal Co. has placed a contract with the **Lumaghi Coal Co.** for furnishing 500 tons of "Cantine" 6-in. lump coal per month, and one with the Searles Coal Co. covering its requirements of McClintock lump and egg. Both contracts run until Apr. 1. Address John Reenan Coal Co., St. Louis, Mo.

Granite City, Ill.—The contract for furnishing the Draper Manufacturing Co., with approximately 80 tons of 2-in. screened nut coal per month, awarded to the **Lumaghi Coal Co.,** on their "Cantine" coal (p. 1000), was negotiated at $1.37½ per ton. Address Pres. and Pur. Agt. C. L. Draper, Draper Manufacturing Co., Granite City, Ill.

Louisville, Ky.—Louisville Ry. Co. contracts bi-yearly for their fuel requirements which in 1914 amounted to 116,436 tons of pea and slack coal. Deliveries are made by railroad at the rate of 300 tons per day. The company has bin-storage capacity for 1,800 tons, and practically unlimited capacity in the open. Address Supt. of Motive Power F. H. Miller, Louisville Ry. Co., 326 W. Jefferson St., Louisville, Ky.

Louisville, Ky.—The contract of the Central Coal and Iron Company (p. 1000), involving 1,000 to 1,200 tons of pea and slack coal and covering a period of five years, was awarded to the **Central Coal and Iron Co.** at $1.70 per ton. Other bids were requested on this business, but no other companies would undertake to bid on a contract covering this period. Address Pur. Agt. P. M. O'Reilly, Central Coal and Iron Co. 4th and Market St., Louisville, Ky.

Ensley, Ala.—Bids have been received on the contract for furnishing the Bessemer Fire Brick Co. with approximately 12,000 tons of mine-run coal per annum (p. 960) as follows: Pratt Consolidated Coal and Coke Co., $1.25; Sloss Sheffield Coal and Iron Co., $1.20; Eldorado Coal Mining Co. $1.15; Yolanda Coal and Coke Co. (this bid on nut coal) $1.40. No award has apparently been made. Address Pur. Agt. J. W. Minor, Bessemer Fire Brick Co., Ensley, Ala.

Indianapolis, Ind.—The contract for furnishing the County Infirmary with approximately 1,600 tons of Greene County, No. 4 .coal, has been awarded to the **Globe Coal Co.** at $1.84 per ton. This company also received further awards on this business as follows: 50 tons of Hocking Valley $2.95; 50 tons of Ohio Jackson $3.65; 700 tons for the Workhouse on Greene County No. 4 at $1.79; 1,500 tons for Marion County Asylum at Julietta, Green County No. 4 $2.09. **A. B. Meyer & Co.** obtained the contract for the Detention Home at $4.90 per ton for 75 tons of Pocahontas and $5.65 per ton for 10 tons of coke. Address County Infirmary, Indianapolis, Ind.

Financial Department

Geo. B. Newton Coal Co., Philadelphia

Pres. Samuel B. Crowell reports in substance for the half year ended Apr. 30, 1915:

The net quick assets on Apr. 30, 1915 aggregated $613.030 and the net assets $2,113,113; deducting $61,250 for the dividend declared Apr. 26, 1915, on the first pref. stock, and $17,500 for sinking fund, the actual net quick assets on said date were $534,280. While the said net quick assets are still below the sum of $600,000 contemplated by the by-laws, they show an increase of $97,169 over the corresponding item on Oct. 31, 1914. The total net assets show an increase of $31,476 over Oct. 31, 1914.

Exclusive of the first pref. stock about to be acquired with the $20,885 now available, the company has since organization acquired $94,700 of first pref. stock, which is held in the sinking fund, and the dividends on which will be added to the sinking fund.

In view of the general business depression existing during the last six months, particularly in the manufacturing districts, we consider that the company's showing for the period in question is good.

BALANCE SHEET (INCL. B. ROWLAND & BRO., INC.)

Assets	Apr. 30, 1915 $	Oct. 31, 1914 $	Liabilities	Apr. 30, 1915 $	Oct. 31, 1914 $
Real est., bld's., etc.,a	1,747,615	1,756,367	First pref. stock	1,750,000	1,750,000
Good will	2,345,250	2,345,250	Second pref. stock	1,710,000	1,710,000
Trade agreements	822,300	822,300	Common stock	1,750,000	1,750,000
Investments	16,840	16,178	Funded debt	242,000	242,000
Sinking funds	79,845	54,614	Bills payable	205,000	316,428
Cash	187,239	151,264	Accounts payable	525,186	585,076
Bills and accounts receiv.	719,748	734,113	Accrued charges	18,923	8,704
Coal and wood	436,230	531,989	Reserves	56,665	15,570
Miscellaneous	108,894	116,126	Surplus	b206,187	150,423
Total	6,463,961	6,528,201	Total	6,463,961	6,528,201

a Includes April 30, 1915, real estate, $712,411; buildings and improvements, $425,333; machinery, tools and scales, $142,719; horses, wagons and harness, $431,993; and furniture and fixtures, $35,159. b Includes April 30, 1915, special surplus (sinking fund), $74,445; provision for 1st pref. dividend, $61,250; provision for sinking fund, $17,500, and undistributed profits, $52,992.

Lehigh Valley Coal Co.

This company reports for the fiscal year ending June 30, 1915, as follows:

Results—The conditions in the anthracite trade have not been very satisfactory because of the mild weather which has prevailed during the past several winters. While the tonnage mined shows a slight increase over the preceding year, all of the increase was made in the first six months. The second half of the year shows a decrease as compared with the same period a year ago. Our total net income from all sources, after deducting charges for royalties, sinking funds, depreciation and interest on funded debt, amounted to $1,022,815, an increase of $457,955.

Coal Output—The production of anthracite coal from the lands owned and leased by Lehigh Valley Coal Co., including that mined by tenants, was 8,088,901 gross tons, an increase of 211,511 tons. The percentage of sizes above pea produced by the mining operations of the company was 65.41%, a decrease of 1.05%. The bituminous coal mined from the Snow Shoe lands, located in Centre County, Penn., amounted to 258,205 gross tons, an increase of 5,474 tons.

Additions, Etc.—The property was fully maintained and $517,542 was expended for additions and betterments. The steel fireproof breaker at Packer No. 5 colliery was completed and is now in successful operation. At Packer No. 4 colliery the alterations to the breaker and the concentration of the underground pumping are well under way. To reduce still further danger by fire, a complete spray system was introduced at each of the frame breakers, effecting a substantial reduction in the premiums paid for fire insurance.

Prospecting on the Broadwell lands in Lackawanna County is now in progress with a view to commencing mining operations thereon and taking the coal to Heidelberg colliery for preparation.

The operations on the bituminous coal lands at Snow Shoe are being steadily developed to permit of greater efficiency. As soon as the power line, now under construction, is completed, electric haulage will be substituted for mules and electric coal cutting machinery will be introduced in place of pick mining.

The properties at West Harrison St., Chicago, and Fillmore Ave., Buffalo, were sold during the year.

Suit—Included in the cash on hand is the sum of $678,085, representing an amount set aside on account of the special Pennsylvania tax of 2½% of the value of the coal mined. The constitutionality of this law has not as yet been decided by the courts.

Sinking Funds, Etc.—By the sinking fund, $404,000 Delano Land Co. first mortgage 5% bonds were purchased and canceled, reducing the fixed charges by $20,200 a year. "Deferred real estate payments," representing short-term notes given for property in prior years, have been reduced by $100,000. Payments amounting to $112,804 were made to the sinking funds of our various mortgages.

Current Assets—These are $3,521,901 in excess of current liabilities.

Note—For previous annual report of this company see Vol. 6, p. 1010.

Byproduct Coke Corporation

(Eighth Annual Report—Year ending Dec. 31, 1914.)

INCOME ACCOUNT FOR CALENDAR YEARS

	1914	1913	1912	1911
Total earns. from oper.	$472,480	$851,089	$790,526	$479,746
Premium on bonds	....	....	6,500	......
Earns. from investments	36,863	18,270	12,180	....
Total earnings	$509,343	$869,359	$809,206	$479,746
Expenses and taxes	68,467	61,726	51,452	49,009
Bond. etc., interest	108,399	146,108	80,058	61,508
Depreciation, etc	153,758	316,408	262,092	186,151
Dividends	(4%) 155,864	(6%) 180,000	(8%) 240,000	(6%) 180,000
Balance for year	$22,856	$165,117	$175,604	$3,078

BALANCE SHEET DEC. 31

Assets	1914	1913	Liabilities	1914	1913
Plant account	$3,954,783	$3,867,615	Capital stock	$3,896,600	$3,000,000
Real estate	462,694	462,694	Stock scrip	....	891,100
Invest's in other cos	607,903	561,594	Bonds	2,000,000	2,000,000
Sinking fund	287,267	208,061	Bills payable	250,000	400,000
Cash	304,357	250,488	Accrued bond inter't	22,034	22,202
Material and supplies	771,111	1,172,801	Wages	20,339	39,316
Accounts receivable	331,950	367,525	Miscellaneous	33,886	21,207
Miscellaneous	18,741	10,978	Accounts pyable	65,612	81,206
			Undivided earnings	*450,335	446,725
Total	6,738,806	6,901,756	Total	$6,738,806	$6,901,756

* From the undivided earnings as shown above, $450,335, there was deducted $6,580 for bonus to employees, leaving a balance to be carried forward of $404,788.

New England Gas & Coke Co.—Mild weather and poor general business so affected the market for coke that sales of coke and the profits therefrom fell off materially during the year ended June 30. As a result the company paid a dividend of only 3½% for the year as against a dividend of 4½% in 1913-14. The new coal-crushing plant was completed and put in operation. There was also put in operation a new modern coke-crusher.

New England Coal & Coke Co.—During the year ended June 30, 1915, the company sold and delivered approximately 3,424,000 gross tons of coal, an increase of some 651,000 gross tons over the previous year. The Coke Co. paid during the year a dividend of 10% and an extra dividend of 10% on its capital stock. [In 1913-14 paid 10% and 30% extra.] The usual liberal allowances were made for depreciation.

The New England coal market in the year ending June 30, 1915, was far from satisfactory, due to the continuation of poor conditions of general business. Water freights, however, since August 1, 1915, coastwise and particularly off shore, have shown considerable advance due to the war. The company has been able to charter one of its steamers constantly and another steamer intermittently since Jan., 1915, thus securing a share of the high off-shore freights.

During the year the company purchased the ocean-going fleet of the Commercial Tow Boat Co., consisting of two tugs and nine barges. It also purchased the steamers Arlington and Brandon, each of 3,000 gross tons cargo capacity, and has had them altered for the coastwise coal trade. They are now in service between Hampton Roads and New England ports.

During the year arrangements were consummated with the New River Coal Co., whereby this company is assured for a term of years a large supply of high-grade New River coal for shipment to the New England market.

COAL AGE

Vol. 8 NEW YORK, DECEMBER 25, 1915 No. 26

Never Again!

FRANKLIN SAID: *Resolve to perform what you ought.*
Perform without fail what you resolve.

THE time has come to sweep out the corners, brush down the cobwebs, oil the machinery and brighten the brass And this doesn't mean only engines and things made of steel, but rather the equipment of the human body.

What man is there who will start the new year without first taking an inventory of himself and then resolving to correct his faults? Every one of us knows some places where he has failed, and it's a poor sort of human who doesn't intend to make 1916 a better year than the one just closing.

If we lack health, there is one remedy that overtops all others—an orderly life. Yesterday we read the story of a great man who was given up to die when 40, but by eliminating bad habits and bad food he lived to be over 100 years old, having written a valuable book at the age of 83. When past 90, he said: "The food from which a man abstains after he has eaten heartily is of more benefit to him than that which he has eaten." How true it is !

Health is the first essential of success. Therefore our initial resolve should be to lead a temperate life. The story of the man referred to teaches that we can overcome physical handicaps at any age, provided we conquer ourselves and exercise absolute self-control.

After good health we need hope and ambition. There are no insurmountable walls of caste in America that prevent our reaching the highest offices in the land. Our greatest President was a rail-splitter. Our foremost merchant was clerking in a country store at the age of 18. Our most famous scientist, Thomas Edison, went to school but two months, having started to work when 11 years old. Edison said: "The majority of people are burning up one hundred horsepower of fuel in their bodies and taking out only eight horsepower of work."

No man's character will ever rise higher than his aims. If we are content to be nobody, we need not hope ever to be somebody. To succeed a man must be able to lose himself in his work. If a thing is not right, he must not do it; if it is not true, he must not say it. If he would command respect, he must command his temper. If he would attain independence, he must not forget that the best time to practice economy is before he has to. Last of all, he must remember that his companions are his mirror, for a fellow is known by the company he keeps.

For 1916

IN *making your resolves finally, be sure to record them and remember it's the* KEEPING *and not the "making" of good resolutions that is important in developing one's will and in shaping one's life.*

If you want to make 1916 the best year of your life, tabulate your worries and then proceed to determine what causes them. If you are not succeeding in your work, *write down why.* The chief idea is to *write it down*

When you have found out what the trouble is, don't act hastily. Spend a few days thinking it over and spend some of the time alone. The eagle is a great old bird, and one of his finest virtues is his ability to stand solitude.

Sealing Off Mine Fires*

By Joseph Cain†

SYNOPSIS—Fires usually originate at the working face. If they have gained headway, they may become inaccessible and must be sealed off. The construction of the seals as well as their ultimate removal requires great care and vigilance.

The following is a record of the methods used in overcoming no less than 23 mine fires which came within my personal experience and which required more than the ordinary agencies, water and dirt, to put out.

The last of the 23 happened as late as Aug. 2, 1915, and was, like the others referred to, extinguished without stopping the mine except in the district directly involved.

The fire of Aug. 2, 1915, started by the ignition of a gas feeder in the firing of shots in the advanced workings embracing five working places, namely, three entries and two crosscuts, 6 ft. high and between 10 and 12 ft. wide (see Fig. 1). It may here be explained that all places where shots are fired by regular shot firers are examined within two hours after shooting. The shot inspector on making his rounds travels with the intake current. Occasionally he crosses to the main return of any one district to note the conditions of the return air. On this occasion he found the odor of smoke that was not powder smoke and following up the return became fully assured that a fire existed.

His efforts to reach the fire having failed he hurried for help and advised the writer by 'phone. While a crew of workmen was being organized and preparations made for materials, we made a careful inspection of the trouble. We first tested the return at intervals, using safety lamps only. On reaching a point where smoke, fumes and heat became unbearable and it was unsafe to go farther, we decided to seal up the fire zone.

Only a Small Amount of Air Was Allowed to Reach the Fire

In the meantime we short-circuited quite a large portion of the intake current to prevent the entire volume of air reaching the fire. This would enable us to curtain off each of the working districts as near to the fire as possible, so as to prevent the smoke and fumes going to each of these districts and confine all the smoke to one return. We next hurried to the outside and other portions of the mine to obtain the necessary material for sealing. This material consisted of lumber, nails, ducking, tools, two kinds of clay, all available safety lamps, 75 ft. of rope and quite a quantity of drinking water. All material was taken in on the main intake side.

A watchman was placed at the fan and another at the first opening to the main return, so as to prevent anyone entering. The other employees were divided as follows: Two to get the lumber to the sealing location, one to procure the clay, one the water, one to mix the clay properly, two to saw the lumber to the desired lengths and two to prepare the place for the sealing. No naked lights were allowed at or near these places.

In the meantime a further inspection was made, the inspectors going as near to the fire as possible and testing the three openings leading to it, in order that the work of sealing should be done in the surest, safest and quickest manner possible. On the intake side we were able to reach a point near enough to hear the roaring, crackling sound of the fire; we were able to remain here but a moment.

To do this I, with the mine foreman 20 ft. behind, crawled on hands and knees under the smoke. We found the heat unbearable and unbreathable; the roof was falling in thick flakes and water dripping similar to a light rain. We found no showing of gas on the lamp, but we had to use care in handling this instrument to keep it from going out.

Further investigation proving fruitless we returned to seal up, beginning at the intake side. Fig. 1 shows the location, and Fig. 2 the plan and method of constructing the first seal. By this time we had ascertained the number of shots blasted and the approximate amount of loose coal exposed to the fire; thus we had a fairly definite idea of the extent of the trouble.

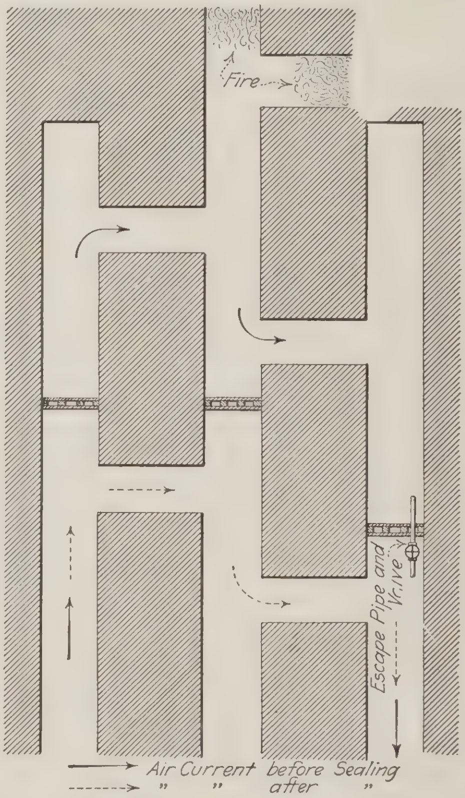

FIG. 1. SHOWING LOCATION OF FIRES AND THE THREE SEALS

All Stoppings Are Similar in Construction

The stopping in the second opening to the fire was constructed like the first. In case of mine fires in general it is not always possible to secure readily 10x10-in. posts or 2-in. planks, hence we sometimes have to use 6x6-in. posts and 1-in. or 1½-in. planks. In the case of 1-in. planks we double over the walls, making sure to break joints at the cracks. In case 1½-in. planks are used we batten the cracks on both sides of both walls with narrow 1-in. lumber. After a stopping is complete water is kept at hand to sprinkle the walls daily to keep the heat from cracking both the clay and the wood. In the event that there is a seepage of gas, this is easily detected by its odor and tendency to put the light out, when this is held near to the floor. If we cannot stop the leak by an additional layer of stiff clay, we proceed to dig out for and build up another wall with clay filling, tightly packed between the new and old walls.

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*Paper read before the Kentucky Mining Institute, Dec. 3, 1915.

†Mine superintendent, Stearns Coal and Lumber Co., Stearns, Ky.

In the construction of each seal we allow no more air to reach the workmen than is necessary to hold the smoke back. To gain time we start the second seal before we have completed the first. We have one man keep watch of the smoke, for if a fall of roof takes place at or near the fire, if the fan should stop or any disarrangement of the main intake current occur, the smoke would back out in spite of the fact that the return from this fire is yet open. The fact is a roof fall may occur at or near the fire, the sound of which may not reach the workmen as soon as the smoke, hence the necessity of one person watching for these disturbances.

In the case of the fire mentioned after completing the first and second seals with the exception of the plastering or finishing touches, we hurried to the third and last one. Here is where trouble and danger and all kinds of annoyances are met; here is where things happen that are more or less unexpected. No two fires act alike in the work of the last sealing, hence each man taking part in this work has to be on the alert. The most experienced man has nothing to do but watch and guide the others, if sick men or something worse is to be prevented.

A Difference of Opinion

Mining men differ as to which point should be sealed up last, but as stated in the beginning of this paper, from the experience of sealing up 23 fires and the fighting of 11 others which did not require sealing up, I firmly believe that the least evils are encountered by leaving the return side to be last sealed.

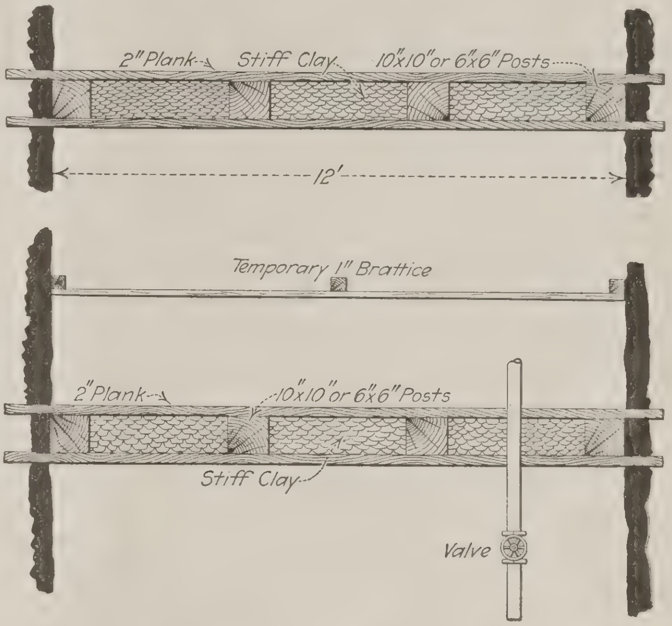
If, however, there are several openings to the fire to be closed and by oversight or delay the fire has made great headway or if a strong feeder of gas is the cause of such a fire and the sealing up is undertaken quite a distance back, I would seriously consider whether or not the return should be sealed up first.

The following points should be kept in mind when a fire occurs: Catch the fire as near to the time of its origin as possible; put it out by the direct method, if feasible and safe to do so; never allow a gas feeder of any size discharging its gas back of the advanced working face to continue to reach the working face, even though you may be able to dilute it with the air-current to a point below the explosive mixture. There may come a time when you will wish you had conducted it to the return direct from the fissure. Seal up as close to the fire as possible. Don't allow any more air at the place where the seal is to be made than is needed. Direct this air by brattice or curtains close around the workmen. Compel the men to do their work overhand and do not allow them to get their heads to the roof and inhale an overdose of smoke.

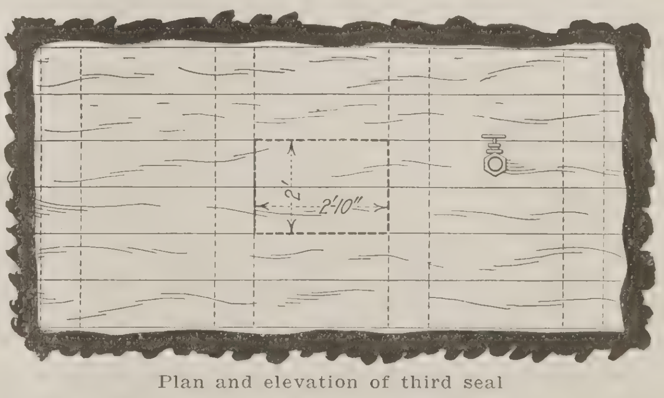
I have never yet thought it advisable to start sealing up the return from a fire first, for that would tend to make all sealing up places the return and, as stated above, erecting the last seal is a tough job which must be done with fresh men with their minds on the alert for danger. The man who has only read about sealing up a fire is likely to find himself in the wrong place.

Erecting the Seal in the Return

In erecting the last seal I proceed about as follows: Have everything ready and handy. Run up a frame curtain or rough brattice on the inby side of the complete sealing location; try to keep the smoke back (this is a difficult job) in one way or another to help the workmen. Work about two men for 15 min. at a time; run the main seal up in sections from the bottom upward; run up both partitions simultaneously, the clay wall included. Pack the stiff clay tight with pressure; have a stick in your hand to tap the first man who raises his head too high into the thick smoke. Insert the escape pipe with valve and locate it to one side and one-third or halfway above the floor (see Fig. 3).



Plan of first and second seals



Plan and elevation of third seal

FIG. 2. CONSTRUCTION OF THE THREE SEALS

When every place leading to the fire is sealed, remove all check affecting ventilation to this point, allowing the largest available amount of air to pass through the open breakthroughs and to all working places, so as to sweep out all smoke and gases that may have reached these points during the time the air has been restricted in them. In due time inspect all places to see whether O. K. and fit to work.

Near the return seal where the escape valve and pipe are located, an easily constructed brattice or curtain with a small door made of ducking or canvas is put up in front of the pipe so as to be able to test the gas coming from the fire area. This test may be made every evening after all workmen have left the mine.

With the curtain door down and the valve partly open, test the place as you test for gas. The fact is you will find no gas to show a cap for the first three or four days, but on bringing your lamp down to the floor near the end of the pipe you will find a gas that will put out the light at once. This will be found for three or four days. About the fourth day you can get a cap showing on your lamp. This showing will get stronger each day, and during the night, while no one is at work on the return side, you will leave the valve open for several hours. The showing of gas will become stronger from day to day, finally developing a cap on the lamp when held some distance from the pipe.

The Gas Shows When the Fire Is Out

From the indication of the gas from the pipe you can determine when it is proper to open the sealed area. In my experience, with one exception, 17 days was sufficient to smother the fire. In one case it was not out and we had to close it up again. This was because in this case we had to do our sealing some 500 ft. back from the fire, hence we closed in considerable air which supported combustion. In unsealing it is my experience that it is best to proceed as follows: We curtain off all other districts so as to prevent the escaping gases from reaching them and to confine the return from the fire to one aircourse, so that an inspection may be made. We then close up the crosscut brattice, leaving a curtained manhole 3x4 ft. The four thicknesses of curtain are held up until we quickly knock out a 34x24-in. opening. There must be no lights, not even a safety lamp, in line with this return, even though a full air current is passing nearby. One man is left to complete the opening in this seal.

As soon as the 34x24-in. opening is made we proceed to the first or intake, seal. The 3x4-ft. four-thickness curtain is dropped down over the opening in the crosscut. The air current then passes through to the heretofore closed-up fire area.

With the air current connection now made certain we leave this district, placing one man with a safety lamp at the first easy opening to the return, or about 400 ft. outward. Another man is stationed at a similar place and distance outward, as is also a third, while the fourth man passes along this distance and takes the record of the tests now made in this return from each man. The lamp test in each case is made with great care and at intervals of 10 to 15 min.

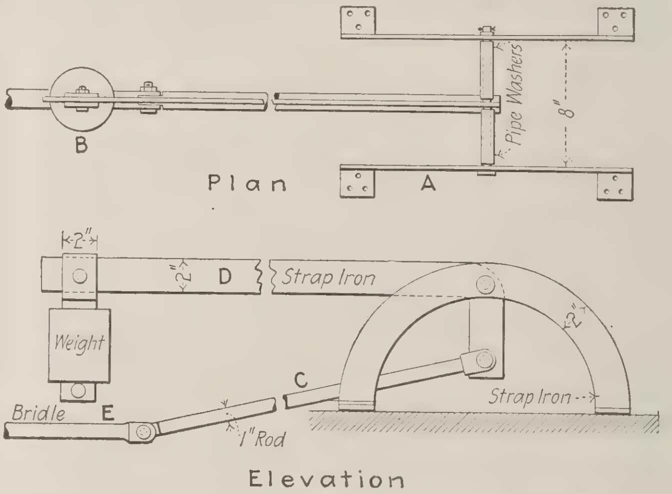
In the case of the fire above mentioned our findings were about as follows: It should be remembered that some 7,000 cu.ft. of air was passing through the fire area per minute with almost a direct return to the fan at each place. When making a test, a man unavoidably allowed a small quantity of the intake to bypass, correspondingly lessening the amount passing through the opened up seal. For the first 65 min. the gas in the return was strong enough to show a quick sharp cap even near the floor, often so quick that it would put the light out before the lamp could be removed. In making the first test it was no trouble to get a cap on the flame for a full 45 min., even on the bottom. After this time had passed no showing of gas was possible. In due time two of us traveled the return as far as the return seal. We then went through the seal on the intake side, making a full inspection as far as the fallen roof would allow.

The opening and places on the intake side as well as the return on last sealing side were not seriously damaged by fallen roof, but the center opening was much damaged, roof having fallen nearly roof high. Nowhere were we able to reach or see the burned coal until we had removed, through several hours' work, considerable fallen roof.

A Weight-Operated Switch

The accompanying drawing shows a weight-operated switch, which is a good substitute for the ordinary device of this kind, which is spring-operated. Being simple in construction, it can be made by any mine blacksmith. It is reliable in operation and will work successfully on any passway or sidetrack where a device of this kind is required.

As may be seen in the drawing, the bridle bar *E* is joined to the connecting rod *C*, which is attached to the bell crank *D*, which pivots between the quadrants *A*. On the horizontal end of the bell crank is attached the weight *B*. It will be thus seen that the weight *B* exerts a continuous force on the bridle bar in a manner exactly similar to the spring on the ordinary switch.



DETAILS OF THE SWITCH-OPERATING MECHANISM

In installing this switch care should be taken to set the quadrant *A* sufficiently away from the track, so that the weight *B* may readily clear the motor and trucks. The rod *C* must therefore be somewhat longer than the long arm of the bell crank *D*.

Safety First

Study your plant.
Attend to business.
Fear your own temper.
Earn your salary.
Teach others.
Yield to good counsel.

Foresee events.
Investigate all troubles.
Read uptodate literature.
Sweat.
Think.

Future Mining Plants From the Engineer's Standpoint*

By O. G. Petersen†

SYNOPSIS—The keynote of future installations will be simplicity. The elimination of all unnecessary appliances and particularly the avoidance of superfluous parts in necessary equipment will do much to lessen the cost of the mine output as well as increase the safety of the operative.

The word simplification will express the trend of all mining plants of the future. The consistent application of this idea to the plant as a whole, and more particularly to the component parts, will bring results in continuity of operation, cheapness of product and what is becoming daily more imperative than either, freedom from accident to operatives.

As one visits various sections of the country, attempts at individual improvement by cutting out some unnecessary step are to be noticed. But to go at the problem boldly, to ruthlessly cut out beautifully running wheels flashing steel shafts and other swiftly moving whirligigs that go so far to make the plant look as though it were doing something, takes courage above the ordinary.

Let us not at once assume that a simple plant is consequently a cheap one in first installation costs. The very process of cutting out numberless inconsequential members brings one's attention to weaknesses in the fundamental outline calling for increase of strength at those points.

Looking at a plant from a combined investment and operating standpoint, say total investment and operating costs for a period of 20 yr., the simple, sturdy plant rises head and shoulders above the others.

The most direct way of bringing out the points stated will be to outline in brief terms the essential features of a mining plant for producing from 1,000 to 3,000 tons per day, with particular reference to the mining conditions found in most regions of Kentucky and adjacent territory.

I believe it is generally agreed that central power for mining-plant operation is the first pronounced step toward the simplification of such an equipment.

Power Unpurchasable Must Be Generated

An operation so situated that it cannot purchase power from the central station will have to do the next best thing, namely, operate its own power plant. By adopting some well-tried but little-used principles, the operator can not only generate remarkably cheap power, but simultaneously increase the market value of his product in a surprising manner. We have all realized most keenly to what bottomless depths the price of nut and slack fell during the past spring and summer. By the simple process of using equipment to consume all of the dust and screenings passing through a 1/4-in. circular perforation we immediately prepare a product that is welcomed in the general fuel market.

To begin with power plant boilers of the most rugged design should be installed, with steam pressures not less than 150 lb. and preferably 200 to 250 lb. The dust and fine coal should be brought from the screens by means of a conveyor, pulverized to an impalpable dust, mixed with the proper proportion of air and burned under the boilers exactly as gas is. This immediately removes stoker investment and repair charges. Through means recently perfected, fire-brick trouble incident to gas firing has been entirely eliminated. Removal of ashes from the boilers should be through a compartment entirely separated from the boiler room, and where the situation permits, the ash-removal apparatus should consist of nothing but a stream of water flowing in a concrete trough.

The boilers should be fed by means of turbine pumps. The steam piping should be of the simplest and most direct type, and the turbines of the noncondensing variety driving alternating-current generators. To keep the operating force to a minimum the boilers and turbines should be installed in a single room without any partitions whatever.

Coal Should Be Received Without Breakage

The coal preparation plant should be of a type receiving without breakage from nine cars that need to be neither uncoupled nor stopped for weighing or dumping. In other words it shall be a type in which there is no tipple crew and in which all operations of weighing, dumping and recording of weights are accomplished by the simple act of having the haulage motor pull the trip of mine cars across the tipple.

Other features of coal preparation and loading, such as a screen capable of producing any size that the market in any section of the country may demand without stoppage or interruption for changing from one size to another, the rescreening of the larger sizes after the first separation has been accomplished, the lowering of the sized coal to the car without breakage, the control of the movement of the railroad cars under the tipple—all these are too well established to require special comment.

Coming now to the matter of haulage and a consideration of the dangers arising from bare conductors, both trolley and power wires, particularly in mines operating in a low coal measure, the wonderful improvement of the past two years in storage-battery haulage equipment seems to point ultimately to the adoption of this system for all handling of mine cars, be it in the placing and gathering of the individual car at the room or the haulage of the assembled train to the tipple.

In the distribution of power inside the mines, whether for ventilating, pumping or the operation of coal cutters, the double idea of continuity of operation and absolute freedom from contact with live conductors seems to point to lead-covered cable protected by a steel conduit, the latter being laid alongside the mine tracks. At once all delays owing to poorly put-up hangers, insulators falling on account of soft top and conductors knocked down by falling slate are eliminated. The steel conduit will prevent accidental cutting of cable and consequent electrical troubles.

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*Paper read before the Kentucky Mining Institute, Dec. 4, 1915.

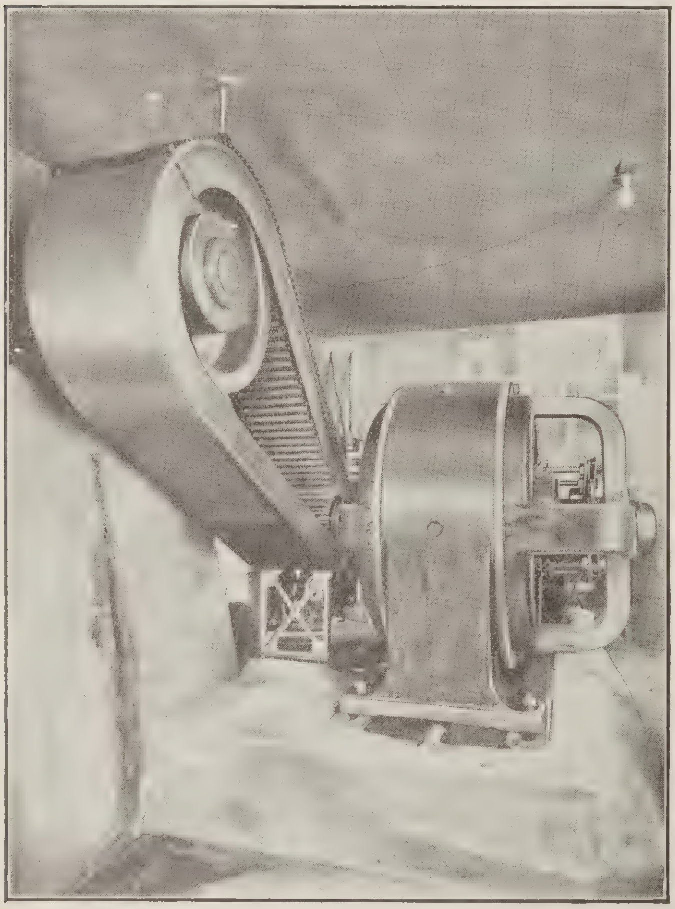
†Associated Engineering Co., Somerset, Ky.

In the matter of undercutting coal, with the heavy investments for repair parts which must be carried in stock, there is not an operator living who has not dreamed of the day when someone would develop a machine for undercutting coal which shall not have more than one moving member and of such weight that it can be easily taken about the mines and operated at the face by one man.

To put the whole matter in a nutshell: The mine having the fewest mechanical and electrical devices, and each device consisting of the least number of parts, all consistent with labor and output conditions, will be the goal we are striving to attain.

Silent Chains in Ventilation

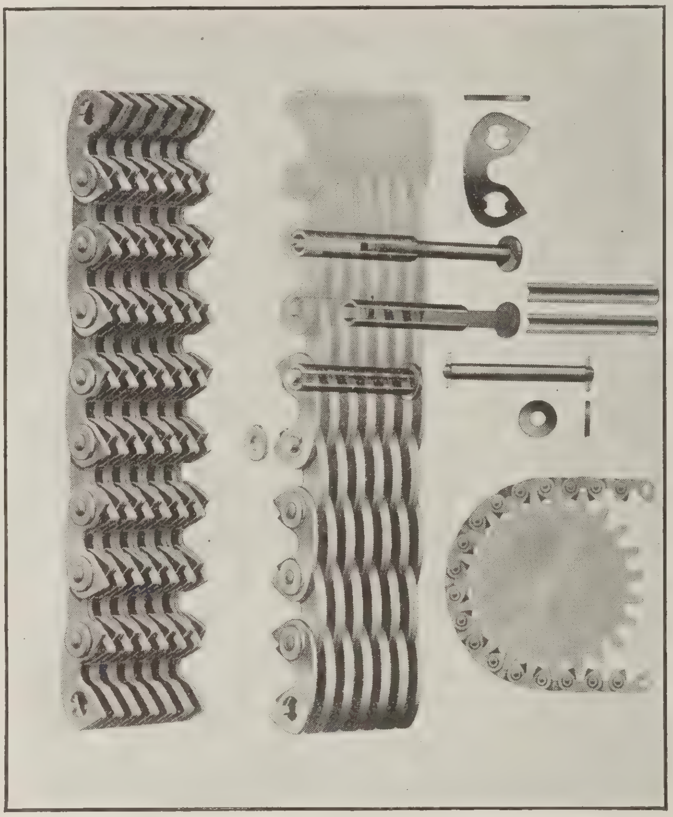
One of the major ideas in modern mining is safety. To attain this end, particularly in coal mining, careful attention must be given to adequate ventilation. Fans and motors were long ago brought to a high state of development, but only within comparatively recent years has careful attention been given to simple, positive, reliable and efficient means of transmitting power between the fan shaft and the shaft of the machine that drives it.



A SILENT-CHAIN FAN DRIVE

Where no change of speed is necessary between the two shafts, a flexible coupling is the simplest and most satisfactory connection. Where the rapidity of rotation of the two shafts is necessarily different, few if any means for transmitting motion exceed the silent chain in simplicity, reliability and positiveness of action.

The silent chain drive as built and sold by the Link-Belt Co., of Chicago, Indianapolis and Philadelphia combines the positiveness and reliability of the spur gear with the flexibility of the sprocket chain. Each drive consists of two cut-tooth sprockets and a carefully constructed steel-link chain. The sprockets are formed and finished by special cutters so that the contour of the teeth will operate to best advantage with the links of the chain and so that sliding, with its unavoidable frictional losses, is reduced to a minimum.



DETAILS OF SILENT-CHAIN CONSTRUCTION

The joints in the chain are made of case-hardened steel pins and semicircular case-hardened steel bushings keyed in the eyes of the links and extending the full width of the chain. This gives an unbroken bearing surface for the full pin length. Long life is assured in a joint of this construction by the area and character of the bearing surfaces. Furthermore, since the links are symmetrical in design, the chain will run equally well in either direction. Additional wearing value is thus secured.

The silent chain is highly efficient, tests having shown as high as 98 per cent. This high efficiency results from the fact that there is no movement of the links relative to the teeth when contact has once been made between them, each portion of the links running at the same speed as the part of the sprocket with which it is in contact.

Because of the entire absence of sliding or rolling action between the links and sprockets, there is also none of the objectionable noise usually accompanying the use of spur gearing, particularly at high speeds.

A drive of this character may be operated with a slack chain. This obviates undue journal friction incident to the use of belts or rope drives and results in decreased friction and a considerable saving in power.

West Virginia Coal Institute

SYNOPSIS—A successful meeting at which nine interesting papers were read was held in Fairmont, W. Va., on Dec. 8 and 9.

The West Virginia Coal Mining Institute held its sixteenth semiannual meeting in the assembly room of the Watson Building, Fairmont, W. Va., on Wednesday, Dec. 8, and Thursday, Dec. 9. On the first day about 50 persons were present and on the second about 100 attended.

The meeting opened at 10 a.m. on Wednesday with a paper by R. Z. Virgin, of Colliers, W. Va., on "The Relation of Mine Officials to the Consumer." Mr. Virgin pointed out that the mine officials and miners were in the end working for the consumer who paid for the coal rather than for the operator who was really merely a middleman. It was necessary to supply the consumer with good coal if orders were to come in steadily.

In the discussion he said that leaky railroad cars for the transportation of slack should not be made tight by the use of props or planks, which make unloading difficult, but rather with paper and excelsior. The company store at his mines being near the loading point, the loaders could easily obtain the material for making the cars tight. J. C. McKinley instanced one mine where hay was used for this purpose at $21 per ton, whereas straw at $6 would have served the purpose equally well.

The next paper was by J. R. Cameron, of Cincinnati, Ohio, and was entitled "Why Buy a Storage-Battery Locomotive?" Mr. Cameron was "neutral in thought and speech" and left the hearers to draw their own conclusions.

A discussion then took place as to whose duty it was to take care of water when the owner of a lower property got over the line and drained the dipping working of the man who owned the adjacent higher property. The matter was really more one for lawyers than for a body of engineers and other mine officials, so no answer was forthcoming.

Provisions of Compensation Act Discussed

The matter of workmen's compensation then received some consideration. It is necessary for the physician, the operator and the injured man to file affidavits testifying to any accident. In some cases ignorant men failed to make their statements, partly because of their illiteracy, partly because they did not realize the necessity, partly from inability to declare the nature of their accident and more often because a notary public was hard to secure. In many cases the men were too severely hurt to travel to the notary and too poor to pay one for making a trip to the bedside in the mining village. Thus the claim was not satisfactorily filed. Some operators, J. B. Hanford, of the Elkins Coal and Coke Co., among them, had provided for this difficulty since the law had gone into effect by securing notarial powers for someone residing in the mining village.

R. Z. Virgin, a superintendent of the West Virginia-Pittsburgh Coal Co., at Colliers, W. Va., said that the present system of not making partial payments is unfair to the workingman. It is not right to leave the compensation unpaid until the man returns to the mine. Such a long delay means one of two things—either the company must advance the money and run a risk of losing it or else the man will starve.

In the afternoon R. J. Beaman, of Cincinnati, Ohio, read a paper on "Uniform Accounting and Cost Records as Applied to Mining." I. C. White, the former state geologist, declared that the individuals of the Federal Trade Commission had decided in favor of uniform accounting for all coal companies doing an interstate business; that is, mining coal in one state and marketing all or a part of it in another. The commission had, he declared, the power to demand this uniformity in the keeping of accounts, but it would rely on moral suasion. It would supply experts to aid in the conversion of the accounts to the new basis, not charging anything for the service except the actual expenses incurred by the experts.

Some Concerns Do Not Know Costs Within 50c.

Some concerns, he said, had such a loose way of figuring mining costs that they did not know within 25c. or 50c. what was the real cost of their coal at the tipple. They overlooked entirely depletion, depreciation, obsolescence, the life limit of the mine, the loss due to accidents and the hazards of the industry, thus blindly basing the cost on the payroll expense. He urged that a knowledge of the real costs would make the operator more careful to sell always at a price that would yield him an assured return.

Under the head of depreciation due to the industry the author of the article brought out the fact that a plant which was established and capable of continuing in operation might well become inoperable because the haul would become so great. The machinery and the heading work might continue to have an ability to handle coal, but it would be necessary to sell or transfer the first and close down the second because coal could no longer be handled at a profit.

J. B. Hanford wanted to know what that haulage limit was. He was of the opinion that his hauls, from an economic standpoint, were constantly getting shorter. In the earlier days of the mine the equipment, both of track and motive power, was so inferior that the cost of haulage was really higher than he could secure, now that he had laid his main haulages with 60 lb. rails and had installed new equipment which would handle the tonnage with much greater facility.

W. E. Fohl, of Pittsburgh, thought that the haulage did not determine the "cruising radius" of the mine. This was determined by the acreage with which the operator felt able to burden himself rather than on the length of haul. The coal-mine owner could not profitably pay interest and taxes and expend the money for testing more than a certain territory of coal for any single operation. So the depreciation described as due to the industry was due always rather to the restricting action of acreage than to the limitations on a profitable coal haul.

Mr. Fohl also suggested that it would be well if a committee was formed in every district to discover the exact cost of mining coal at all the mines in the district. These results could be tabulated, the various statements, however, of the companies supplying the information being kept entirely secret. In this way the members of any one district would know what was the safe and sane price to charge for a ton of coal.

Several members thought that any system of accounting which failed entirely to consider the increase in the value of coal land led to incorrect assessment of costs. They said that many mines might keep accounts as Mr. Beaman proposed and might figure they were selling at a loss, whereas as a whole they would be doing well, for the coal in the hill, while depleted in quantity by mining, would be growing in value by reason of the increase in the selling price of what remained. This Mr. Beaman regarded as a change in speculative rather than in investment value.

It was pointed out that if two men had tracts of equal value, and one man had bought his coal years ago at $5 per acre and another recently at $150, the two men figuring the cost of production by Mr. Beaman's method would arrive at entirely different results and would probably sell at very discrepant prices. It seemed advisable to figure depletion rates at present coal values and not at purchasing value.

Some, however, disregarding depletion since it is balanced by increased values, took an entirely opposite point of view. They argued that the production costs could be figured as helped by the progressive increment in the value of the coal remaining, thus justifying a lower selling price, a point of view diametrically opposed to the ideas of those who think that the increased value should be correctly mirrored in higher production costs.

Depletion Charge Not to Be Ignored

But evidently this last view is wrong, because better than selling for a price which would not allow for depletion an operator would do well to shut down entirely and gain his increment not only on the unmined reserves but on the coal which, if he had been working, he would have mined.

J. B. Hanford declared that at his mines the depletion on coal land was figured at its actual cost plus the interest, the taxes from the date of purchase and the drilling expense. Thus the depletion charge, far from being constant, varied with the particular area mined.

R. D. Hall said that the accountants when considering the value of a new plant figured only the labor and material put into it and did not allow interest for the period of installation. A shaft that took a year to build should be carried on the books at cost plus a half-year's interest even if sunk by the owner. It was worth no less if he built it than it would be had a contractor sunk it, and such a contractor would look to draw interest on the period of construction, though it would appear probably not as a stated item. It would certainly be in the mind of the bidder and would appear unquestionably on his private cost sheet if he had to wait for the completion of the job before he drew his pay.

Mr. Beaman contended, as accountants do, that nothing may be shown on the books but payments actually made. If interest on bonds were paid, then this interest could be entered without violence to correct accounting rules.

Mr. Hall also said that the depreciation might well be considered as starting from the completion of the job, for any depreciation of the material used in sinking a shaft would be charged by the contractor as part of the cost of sinking, and the timber in the shaft would inevitably be paid for by the operator as if it were newly installed. Of course the remaining life of the material incorporated in the shaft or merely used in the work of its construction would be less than if it had just been put in. If its economic life was 20 years, whatever had been in, say a year, would have to be depreciated not 5 per cent., but as if it would be valueless or have a junk value after 19 years.

Greer Submits System of Mining by Panels

G. E. Greer, of Morgantown, read a paper on "Projecting a Mine on the Panel System." The main criticism was that the long period and large cost needed for full development was prohibitive for a small capitalist or where the union demanded a big differential for narrow work. This argument was advanced by Joseph Virgin, mine superintendent of the Mound City Coal Co., Moundsville, W. Va.

Another critic advocated wing pillars twice as big as the 100-ft. pillars shown and also that the chain pillars be reduced to 15 ft. C. H. Tarleton and A. W. Hesse said that the Consolidation Coal Co., which had at one time favored a 25-ft. chain pillar, had recently tried 35-ft. pillars. In advancing the narrow pillar served every necessary end, but in retreat if there was a squeeze, a 25-ft. pillar could not be split and coal was almost inevitably lost. Mr. Tarleton was not prepared to say that the larger pillar would give satisfaction.

The report of the secretary showed the usual impecuniousness of mining institute funds. The cash on hand was $21.20; the debts were $102. So the balance was against the association to the extent of $80.80. The secretary reported that the bulletin was discontinued as it seemed to put too heavy a strain on the institute finances.

The election followed. W. H. Cunningham proposed that J. C. McKinley act during a second term as president, and he was elected unanimously. E. N. Zern proposed and lobbied for Karl Schoew as secretary-treasurer, but after a ballot he was induced to accept reëlection himself. The vice-presidents will be J. W. Bischoff, manager, Davis Colliery Co.; Josiah Keely, manager, Cabin Creek Consolidated Coal Co., Kayford, W. Va.; George Watson, vice-president, Consolidation Coal Co., Fairmont, W. Va.; Karl Schoew, consulting engineer, Huntington, W. Va.; J. R. Cameron, of the Goodman Manufacturing Co., Chicago, Ill. At the request of the burgess of Bluefield, W. Va., it was arranged that the next meeting would be held in that city.

On the second day, Dec. 9, J. W. Bischoff's paper entitled "Some Suggestions and Ideas Based on Observation" was read by the secretary, E. N. Zern. In the discussion of this paper it was urged that the shortage of labor might be met by greater efficiency. Unfortunately, too much of the waste of labor, according to the speaker, was owing to the fact that there was nothing in the mining contract to reward the operator for all he might do to make the mining and loading of coal move steadily and without friction.

Prompt supply of mine cars, timely cleaning up of coal shot down and undercutting on a regular schedule were necessary for the efficiency of the miners at their work, but as the operator had little interest in the productivity of the miners, it was hard to induce him to expend time and money to provide for the regular operation of cutters and loaders. A mingling of the time and day wage was urged as a solution, the time wage being a minimum payment. The output would then be paid for as at present, but at a lower rate.

It was suggested that a larger tonnage would be made per man if the older breast machines were replaced by shortwall cutters. But this would not be made general till the operator could feel assured of an income from the change. He could hardly be expected to scrap his old machines and buy new ones solely because the change would enable the miner and loader to earn a larger wage.

The speaker who urged this mingling of time and output wage met nothing but opposition. Josiah Keely said that if it were not for the probability that mules would be killed in the wild rush for tonnage, he would advise putting all the drivers on a tonnage basis, so as to give them an interest in their day's work. Joseph Virgin said he would like to see everybody on piece work, as output wages made supervision less necessary, while J. C. McKinley urged that even the mine foremen would do better if paid at least partly by a bonus, and he reported that he had been successful in introducing the bonus system for efficient mine foremen at his mines.

In opposition to what had been said he believed that it had been generally found that additional bosses would increase tonnage and so give a larger output to pass over one tipple and make operation generally more efficient than it would otherwise be.

Product of Breast and Shortwall Cutters

He declared that it was true that the miner gained much direct benefit from the replacement of the breast machine by the shortwall, which latter he estimated did 50 per cent. more work than the former.

C. H. Tarleton stated that the Consolidation Coal Co. in West Virginia was unable to show a difference of 50 per cent. between breast and shortwall machines, no matter who ran them. J. R. Cameron said that the output was often determined largely by custom and not by the capabilities of the machine.

Josiah Keely was surprised at Mr. Tarleton's statement, for he had found that the shortwall machine cut twice as much as the breast machine in an ordinary room. He really was surprised that the Consolidation Coal Co. could not get as favorable a result when cutting the Pittsburgh bed, which he regarded as not in any way harder than the splint bed in the Cabin Creek district.

G. A. Burrell then demonstrated his portable gas detector. It is really in the borderland between an indicator and an analyzer. It consists essentially of a U-tube partially filled with water, the end of one tube being provided with a rubber mouthpiece. The fireboss or inspector blows into that end, and as a result the other limb is filled with water. As soon as the operative ceases to blow into one limb, the water falls to a balancing position, causing a vacuum in the other. This vacuum is filled by the atmosphere of the mine.

In the limb thus filled with gas a platinum wire has been introduced. This is caused to glow for 2 min. by the electric current generated by two Eveready cells incorporated in the base of the instrument. This burns the methane in the mixture, causing a partial vacuum which the water rises to fill. The movement of the water thus caused is a measure of the gas burned. Of course the temperature is raised somewhat, and the apparatus must be shaken to reduce the mine air and combustion products in the graduated limb to the temperature of the water used.

Mr. Burrell, on being questioned, said that each cell cost about 6½c. and a pair would serve for over 20 determinations. The whole instrument made in quantities should not cost more than $5, and the platinum should serve for several hundred indications. The detector will measure methane down to 0.1 per cent., and the limb is graduated to 4 per cent. The upper range may be extended if the actual percentage of methane is not sought, the observer being only anxious to determine the presence of the gas in large quantity. Air containing 5½ to 14 per cent. of methane will explode and so show that methane is present in some unknown proportion. Above that percentage the methane will not burn. The explosion is not to be dreaded, as the violence is small and is cushioned by the water. A few fine drops of fluid are thrown out, and that is all the damage done.

In answer to an inquiry as to the means of ascertaining whether the combustion limb of the tube was completely filled prior to admitting the measured quantity of mine air, Mr. Burrell said that the operative should blow until he heard a click which evidenced that the limb of the tube was full. The instrument would give practically unaltered results if ethane constituted as much as 15 per cent. of the combustile gas admixture.

An Accurate Instrument for Untrained Men

The water must be maintained at a certain marked level, so that the graduated limb will contain 2 cu.in. of air when the water is at the same level in both limbs. There is not enough carbon dioxide dissolved to affect the result. The small quantity present makes such absorption negligible. Mr. Burrell claimed that the new detector could test eight samples in the time needed to make one Hesse test.

The sample having been taken by blowing and allowing the water to fall, the operative could cause the platinum to burn the gas while he was passing to another place. He could examine the instrument and take his record just before preparing to take another sample. However, J. Virgin contended that even under those operating conditions a mine would have to employ four firebosses where one is now engaged, if the requirement that examinations be made within three hours of the miners' entering their working places was to be strictly maintained.

Frank Haas, the consulting engineer of the Consolidation Coal Co., declared that he looked with much favor on the innovation. His company was using a method involving the taking of flasks into the mine and thus securing samples. The new method was far prompter and made it possible to ascertain present conditions rather than those existing some few hours before. He believed the method of great value in determining the character of the air in the return airways as far as combustible gas was concerned.

It was the custom of the Consolidation Coal Co. to estimate methane to 0.01 per cent., not because it was valuable to know how much combustible gas was present to such a degree of nicety, but because it was important to find whether the degree of methanization was increasing or decreasing. The company does not tolerate more than 0.25 per cent. of combustible gas in any of the return airways of its mines.

Someone made the statement that ½ per cent. of "gas" could be detected by the Wolf lamp. J. L. Ryan declared is was possible, but not practical. When there is over 1 per cent. of gas present, the trained observer can guess the quantity within ¼ per cent., but there are a great number of men who will be oblivious to the presence of gas in the lamp till 3 per cent. is reached.

G. S. Brackett's paper on "Day Labor in Bituminous Mines" followed, but failed to draw discussion because such a mass of figures can be analyzed and appreciated only in the privacy of the study.

Mine Depletion and Depreciation Estimates

J. B. Hanford rose to vindicate the methods of his company, the Elkins Coal and Coke Co. He certainly could not allow his company to be associated in a group with those which kept such poor records of expense that the cost could not be determined within 25c. or 50c. per ton, as stated by I. C. White of many unnamed companies in his statement of the previous day.

Punctilious though the record of the Elkins Coal and Coke Co. is, the depletion and depreciation is only figured annually and not monthly, as J. C. McKinley advocated. It is not well to run for a whole year and then repent at leisure when a report exhibiting all the cost entailed is for the first time presented.

The discussion drifted naturally to the percentages allowable for depreciation. C. H. Tarleton declared that copper was by no means of such long life as was generally thought. For while it did not lose by friction or oxidation, its occasional contacts with coal, roof and floor caused short-circuits resulting in its depreciation and depletion in weight, and it soon hardened till it became too brittle for use.

He considered it an open question whether light rail and all copper should be credited to equipment or charged direct to operative expense. Rail in wet places suffered rapid oxidation, and both C. H. Tarleton and J. B. Hanford urged that regarding rail as one of the direct operating charges prevented the foremen from wasteful requisitioning and lack of care of the material furnished.

Mr. Hanford said there was a large loss from cutting rail to pieces and from bending. Much loss from crystallizing also results. Much rail that is giving excellent service in a wet place will prove utterly unfit when lifted and spiked onto other ties. It was also said that many of the rerolled rails prove to have a rapid deterioration. The ball of the rail falls, and the web turns down. It was urged that billet rails be kept separate from those rerolled, for they alone are suited to switch work.

E. B. Day recalled the opinion delivered at a previous meeting that some cutting machines depreciated about 25 per cent. in the first year, but less could be deducted for this cause in succeeding years.

It was decided to hold the meeting next winter in Huntington, W. Va., and to invite the Kentucky Mining Institute to participate. At the closing of the morning's business several visited the Consolidated Coal Co.'s laboratory in the basement of the assembly building.

The afternoon session comprised an address on "Welfare Engineering as Applied to Coal Mines" by W. F. Hyde, of Wheeling, W. Va., and "Needed Reforms in the Coal Mining Industry" by K. F. Schoew, a consulting engineer of Huntington, W. Va.

At the evening session, over which J. C. McKinley also presided, Governor H. D. Hatfield was the principal speaker. Judge W. S. Haymond, of Fairmont, made the opening speech. The Governor flayed the operators for attacks on his administration and defended himself against the charge of being disloyal to the coal industry of his state. At the conclusion of the speech the Governor, probably because he was Governor, received much applause. Those who heard the speech of Governor Brumbaugh of Pennsylvania before the National Safety Council in Philadelphia would naturally contrast that humanitarian appeal with the exasperating remarks of the West Virginia Governor. It would be better for Governor Hatfield and his state if he would seek to lead and not try to drive. J. C. McKinley, the president of the institute, closed with a paper which did him and the institute much credit.

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Mine-Car Resistance

By E. B. Wilson*

It is customary for engineers to reckon 20 lb. per ton as the resistance offered to mine cars on a good track. My notes show that this is insufficient, as there are a number of items having a bearing on the subject.

A. M. Wellington found that it required 5 lb. per ton to pull a loaded freight car and 7 lb. per ton to pull an empty freight car over a level railroad track at 10 mi. per hr.

R. Van A. Norris made 980 tests some years ago, which gave a resistance of 26 lb. per ton for 20 loaded mine cars and 42 lb. per ton for 20 empty mine cars of the same size over the same track, traveling 4½ mi. per hr. One reason for the wide difference between the two sets of experiments mentioned is found in the size of the car wheels.

The freight cars had 32-in. diameter wheels, while the mine cars had 16-in. diameter wheels, thus making it possible for the former to ride over the inequalities in the roadbed with more ease than the latter.

Mr. Norris's experiments brought out another important matter not usually mentioned in haulage articles; namely, that it requires more power per ton to haul short trains of mine cars than longer ones. This is of added importance to those mines which have adopted the two-unit locomotive in order to pull heavier loads.

One factor that probably reduces the ton resistance in longer trips is that the forward cars clean the track; and another is that the greater momentum of longer trips aids in keeping the cars moving.

Professor Baker made some experiments on clean and dirty tracks, the results of which briefly were as follows: On a perfectly clean track the resistance was 19 lb. per ton; on the same track with ⅛ in. of fine dust the resistance was 28 lb. per ton; while with ⅛ in. of powdered stone the resistance was 40 lb. per ton. This should comfort superintendents in the soft-coal mines who begrudge spending money on road cleaning, because when they clean the haulage entries, they not only lessen the dangers from explosions, but decrease the cost of haulage.

It is also a lesson for some anthracite superintendents, for fine anthracite is nearly equal to sand in offering resistance to traction effort.

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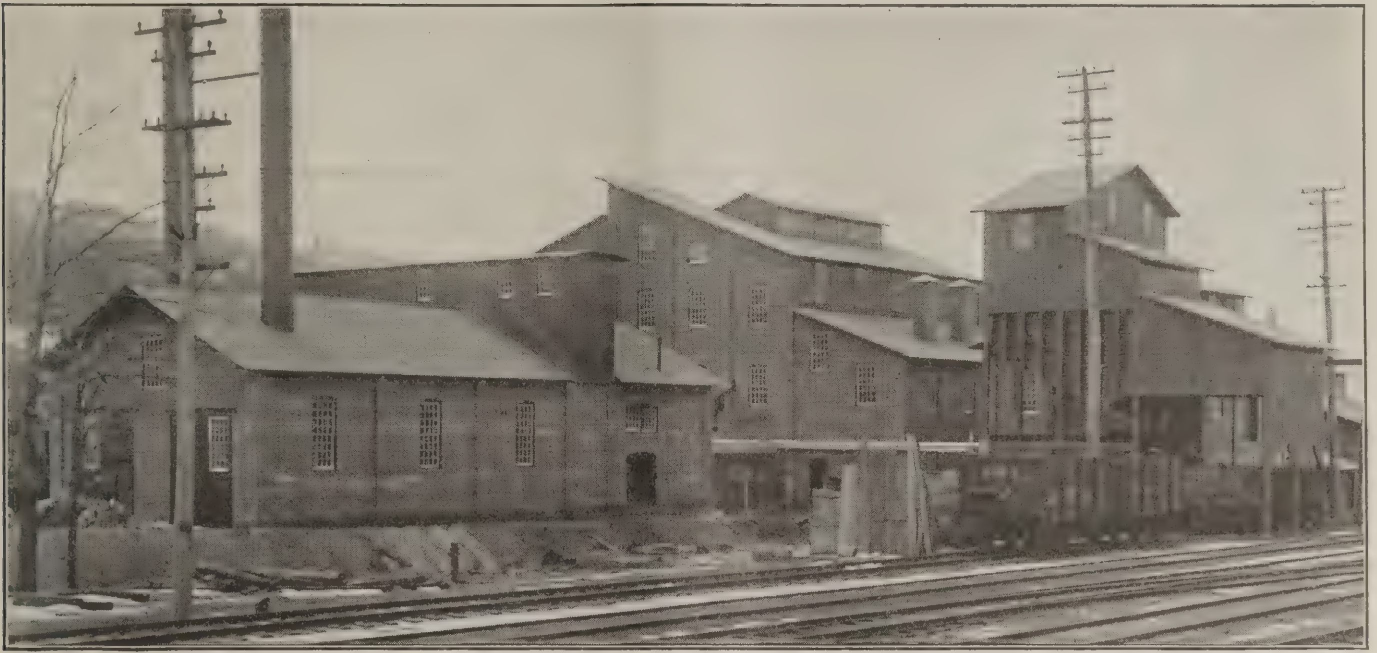
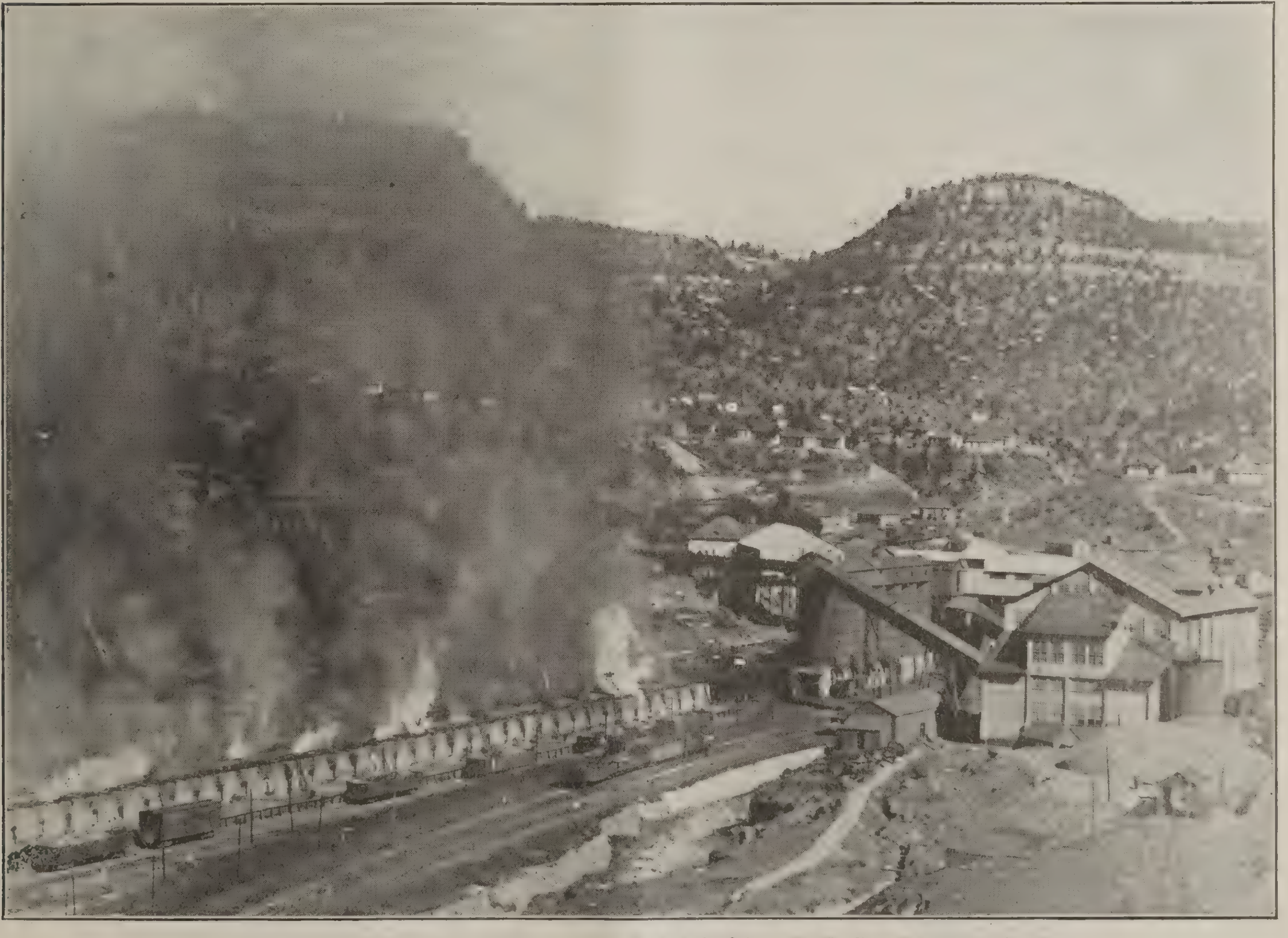
*Scranton, Penn.

Snapshots in Coal Mining



BRIQUETTE PLANT OF LEHIGH COAL AND NAVIGATION CO., LANSFORD, PENN.



COAL WASHERY AND COKE OVENS, STAG CAÑON FUEL CO., DAWSON, N. M.

Labor Problems at Coal Mines*

By J. W. Bischoff†

SYNOPSIS—The labor problem is of leading importance, and many a plant at great expense solves every difficulty but this and fails to be efficient because it works perpetually at half-force.

The most acute problems in the production of coal today are the scarcity of railroad cars and the lack of efficient labor. Fortunate indeed is he who is well supplied with both.

As mining men we are not directly responsible for the lack of railroad equipment, and we are in no position to remedy our difficulties. Nor are we able to correct the labor shortage except by inducing men to come to our mines from the plants of our competitors. There are few among us who fail to look at that question from a personal or selfish standpoint and who would not welcome an increase in their working forces, even though the men acquired were secured by someone's loss.

Scarcity of cars and labor, distributed equitably, impose a loss on no one; the final results, measured by dollars and cents, are the same. He who has plenty of both during times like the present is the envied one among the brethren.

Conscientious scruples are forgotten if by hook or crook the daily allotment of cars can be increased; also if the superintendent, foreman or some boarding boss can get some of the other fellow's men. In other words there is not even a gentlemen's agreement that would be violated in thought or deed if we see an opportunity to take advantage of our fellow man's shortcomings.

Labor Problem Given Minimum Consideration

During even ordinary periods of prosperity, with nothing extraordinary affecting the supply of available labor, the problem of a reasonable supply of this valuable commodity is the hardest that many of us have to solve. Inconsistent as the following may sound, it is the one problem given the least earnest, painstaking and intelligent thought.

Expenditures for machinery and for mining, transporting and preparing the coal for market are freely made by the owners, but the securing of that labor necessary to get the most efficiency from the equipment is, if given any thought at all, delegated to the local officials or left to the whims of chance or fate. We are prone to look upon it in much the same light as did the farmer who in answer to a friend's expressions of sympathy after a season of poor crops said: "Well, I have no reason to complain. Thank God, none of my neighbors have any better crops than I have."

Most of us have no doubt seen operations planned, developed and equipped for a production which was never reached by more than half owing to the lack of sufficient men. The loss in interest on investment alone is considerable, to say nothing of the profits (when there are such) on the additional output that should have been secured.

The newcomer in an already operating field, where the conditions and regulations of work are not fixed by the operator at his pleasure, learns the rate of wages paid and the house rents and store prices charged and follows scrupulously the practice of the district. He hopes when he is ready to mine that he will get an adequate supply of men; but he secures only those who are always on the outlook for a new operation. He has no reason to expect that enough men will leave other mines to enable him to operate at a reasonable profit.

As I said before, the labor-supply question is the one given the least earnest, painstaking and intelligent thought. We all know, some by hearsay and some by experience, that men may be secured by paying the transportation charges. I do not believe we now so frequently advance such charges in West Virginia as in the past. Under favorable conditions it works well. But as communities become more thickly settled, communication is much easier and more frequent, and if one alone indulges in the practice, his neighbors will benefit as much or more than he does. But with all its drawbacks the practice of paying railroad fare to needed mine employees is even yet resorted to.

Sociological Work without the Social Sense

Of late years we see and hear a great deal of sociological movements and moral uplift, which take the form of first-aid teams and meets, amusement halls, moving-picture shows, Y. M. C. A. movements, visiting nurses and domestic science teachers, more sanitary conditions about the camps, better houses, etc., all of which are good.

It shows that we have awakened to the realization that we are dealing with and have under our control something—a living and breathing being capable of thinking and acting—which we indirectly acknowledge we are dependent upon and whose place in the fixed order of things is invaluable; that it is profitable to keep him with us, and the better satisfied he is while he is with us the more profitable he is. This sounds mercenary. It is. But in the natural order of things, the interests of the two are so closely allied that one cannot truly prosper without the other doing likewise.

I do not mean to criticize adversely any of the welfare movements before mentioned, but I will venture the statement that they are more or less superficial, and unless conducted with judgment and knowledge of human nature as it presents itself in those we desire to influence, they are likely to be of little or no lasting benefit. As an example the following case occurs to me: Arrangements had been all but completed to install a visiting nurse and settlement worker in a certain mining town, but for some reason unknown to me it was abandoned.

Now these were a few of the actual conditions existent in that town: It was isolated. No passenger train service approached nearer than two miles. There was no means of ingress or egress except by walking, not even a wagon road. The houses were all built on a hillside, and no garden patches were available. Moreover, there were no fences around the individual houses. Livestock of all descriptions roamed at will. No coalhouses were provided, and the coal was unloaded on the ground, both in summer and winter. This was the custom when the team had time to deliver coal; otherwise the tenant carried his own fuel. The surface closets had received no attention for years, and there were many other faults in that mining village which I have not mentioned.

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*A paper entitled "Some Suggestions and Ideas Based on Observation," read Dec. 2 at Fairmont, W. Va., before the West Virginia Coal Mining Institute.

†General superintendent, Davis Colliery Co., Elkins, W. Va.

These conditions no doubt are extreme, but they are cited only as examples to show how mistaken we can sometimes be in our misguided efforts to uplift. I might add that I happen to know that the project of uplift was not abandoned because the conditions in the village were so unfavorable.

Should Miners Secure Homes of Their Own?

The weight of opinion seems to be against the miner owning his own home, but a casual investigation of conditions where such purchases have been made to some extent should furnish sufficient proof that within certain limits and under certain conditions the miner's ownership of a house and lot is beneficial to both miner and operator. It cannot always be advantageously arranged on account of unfavorable natural conditions, the uncertain or certain short life of the mine and other difficulties that could be mentioned, but cases are numerous where it could be applied, and on the whole I am inclined to favor it. Any man, though there are sufficient exceptions to prove the rule, who is ambitious enough to want to own his home will make a better citizen and workman. He is likely to be steadier, more conservative, reasonable and amenable to discipline.

And then the question arises as to the desirability of the company store as I prefer to name it. I do not like to hear it called the "commissary." That term is appropriate when applied to the store rooms of construction camps of railroads and reasonable enough when applied to the stores installed to take care of workmen engaged on some temporary job, but the use of the word in a mine village reflects on the stability of the industry.

The treatment, in every sense of the word, accorded the miner and his family in their dealings with the store can have as much or more influence upon the miner for good or evil than his relation with the superintendent or foreman. This fact is too often overlooked. In many cases the responsible head of the mercantile department reports to someone higher up who is not in touch with actual everyday conditions around the mines. Thus in his effort to show his part of the business to the best advantage he creates friction and discord for the local managers and superintendents. I have known more dissatisfaction to be caused by a real or fancied wrong at the hands of some unthinking clerk than the foreman would cause in months.

Fortunate indeed are those who are never troubled with labor shortage. The others may take a lesson from their more favored neighbors. There are numbers of mining communities that are able to command a steady supply of labor. Study them, learn from them and profit from the mistakes of him who is satisfied to stay in the same old rut.

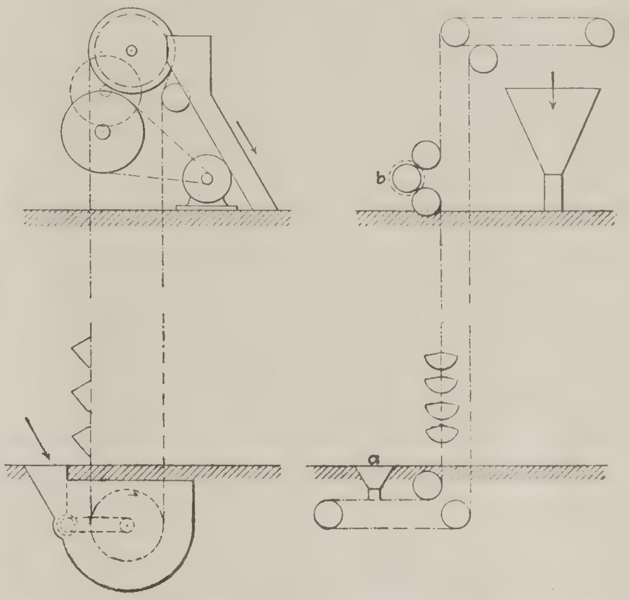
There is a fixed amount of labor, and he who gets more than his quota will be the one who will reap the biggest harvest. I have not intended to introduce sentiment, humanitarianism or paternalism into this discussion, for to me this care of the miner's interest appears to be a simple business proposition.

The Conveyor as a Shaft Hoist

The ordinary shaft hoist has certain inherent objections, such as weight and inertia of intermittently moving, imperfectly balanced parts and loss of time through the reverse motion. These obvious disadvantages increase with the depth. They may be largely overcome by a hoist on the belt-conveyor principle, and although the latter introduces many new difficulties of its own, it is interesting to see how far these can be overcome and whether there is an economic field, at least a limited one, for the continuous elevator in vertical shafts.

Attempts in this direction have been made in Germany, for example, with some success in shallow mines. The various systems are discussed in a noteworthy article in "Glückauf," by Dipl.-Ing. F. Wintermeyer, of Berlin.

Two of the oldest German installations are at the Emma mine of the Consol. Sudersche Lignite Co., Helmstedt, and the Karoline mine of the Germania Co., at Gorma, near Rositz. These were made by the Machinenfabrik Buckau and the hoisting depths are 170 and 128 ft. respectively.



FIGS. 1 AND 2. TWO ARRANGEMENTS OF BUCKET ELEVATORS AS SHAFT HOISTS

Fig. 1 is a diagram showing the principle of these hoists, without entering into details. The one at the Karoline mine is driven by a 25-hp. motor and with a chain speed of 2 ft. per sec. the delivery is 70 tons per hour.

An improved type of elevator has pivoted or swinging buckets, as shown in Fig. 2. Here one of the filling hoppers is marked *a*. At the Johanne Henriette lignite mine, near Unseberg, is a swinging-bucket hoist made by the Buckau works for a depth of 262 ft. Shaft guides are provided for the chain. Two men suffice to attend to the hoisting.

A design of continuous hoist intended to be applicable to greater depths is David Davy's English system, dating from 1901. It was proposed to lift cars as usual on cages, which were to be hooked to a constantly moving chain and removed from it at the landing. Intermediate sheaves are provided to relieve the weight on the upper one. The system of Cséti v. Verbó differs from Davy's in discarding the use of car cages and hooking the car bodies to the chain as buckets. At the top of the shafts these are dumped without detaching.

Schwidthal has devised a system of motor-driven intermediate sheaves. Unlike Davy's method, they are used primarily with fixed buckets.

Some work diagrams for different hoisting systems will show the power consumption at different points of the operation. Fig. 3 is for a rope hoist with drum and tail rope. Fig. 4 corresponds to a hoist with driving sheave and tail rope. Fig. 5 is for one with drum but without tail rope. Fig. 6 is a diagram for a continuous hoist, that shows not only a greater uniformity but a saving in power.

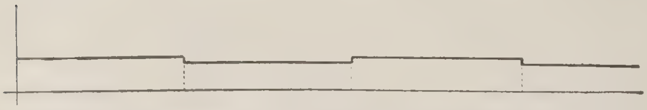


FIG. 3. DIAGRAM OF POWER CONSUMPTION OF A CONTINUOUS SHAFT HOIST

In conclusion it appears that the use of continuous hoists for shallow mines has reached a practical stage while for deep shafts they are more experimental.

Pages from a Miner's Notebook; the "White Collar" Job

It may be pride; it may be only the practical demonstration of the laws of evolution, of advancing the child to a position in life superior to that of the parent; but whatever it is, there is something pathetic to me in the boast of many an old miner who undoubtedly entered the mines at the age his son is now in the last grades of the camp school that "my boy shall never go into the mines."

Yet it is only natural. The father has known nothing but hard, back-breaking toil since his early boyhood, and even though pathetic it is a supreme example of parent love, a manifestation of fatherly care and pride, this desire of the men of the mines that their sons shall have "white collar" jobs.

Still, it is a mistake. There must be miners, and how better, as a class, could miners be improved than by the adaptable, common-school educated American boy following in the trade of his Scotch or English father, learning from this best of workmen the workmanship of the mines and adding to this lesson the natural desire of the American boy to improve on old methods.

The eldest son of an old Welshman arrived in camp last night to "visit" his parents. He is something in the city—physician, lawyer or stenographer—what, nobody seems to exactly know. Whatever it is, he has not made such a mark as to have his fame on every tongue.

His parents were overjoyed to see him, yet his indifference was apparent to all but those same parents. They proudly walked with him up and down the main street of the camp; to the store for their weekly paper, where the son stood about awkwardly, self-conscious under the scrutiny directed to his flashy clothes.

They sat on their front porch until a late hour, yet there was no sympathetic talk between them. The mother asked questions which were answered perfunctorily. A younger sister played upon the piano, the only luxury the old folks possessed except the son, but her music elicited no complimentary response from the guest. The evening was a trying one for all concerned.

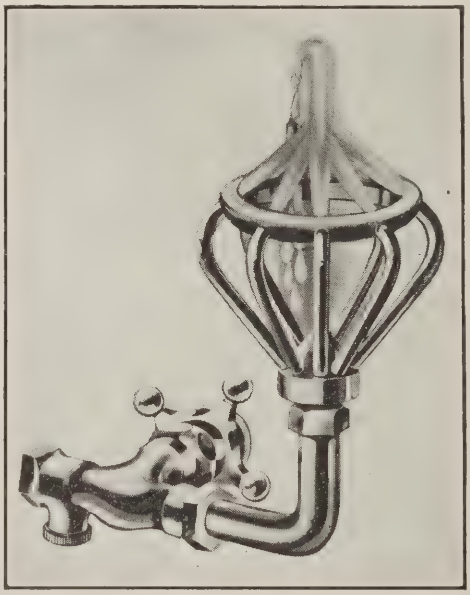
He left for the city this morning after his father had drawn heavily on the scanty savings laid by at the company store, and the old mother, with a puzzled look in her eyes, confided to my wife that there was "somewhat of a difference in her John."

And what a world of pathos there was in that "somewhat of a difference in John"! John would have made a good miner. His earnings, while he remained single, would have added much of comfort to the old age of those self-sacrificing parents; yet that fatherly pride and the carrying out of the boast that "my boy shall never go into the mines" had made him a mediocre physician, or lawyer, or stenographer, or whatever he was; had given him a "white collar" job while his old father supplied the cash to keep the white collar laundered.

Sanitary Drinking Fountain

In its broadest sense the safety movement so prevalent at the present time, and which has for its avowed object the preservation of human life and limb, should also include the preservation of health as well. Conditions that foster or aid the propagation of germs or the spread of contagion should be treated as carefully and as thoroughly as should a dangerous piece of machinery or a section of loose roof.

When many mining companies some time ago discarded the water barrel and dipper for the bubbling drinking fountain in shops, power plants and tipples and even underground, a long step was made in the right direction. Investigation by the Federal health authorities has shown that one person out of every 47 has unmistakable signs of contagion. Any public drinking device that permits a person's lips to touch a metallic surface is not sanitary.



FOUNTAIN WITHOUT BOWL IN OPERATION

As a further sanitary improvement the H. W. Johns-Manville Co. has placed upon the market its J-M Sanitor fountain head. As may be seen in the accompanying illustration, this consists of an annular nozzle from which eight small convergent streams of water are emitted. These meet in midair and form one vertical drinking stream. It is impossible for a person using one of these fountains to touch or otherwise defile with his lips any of the metal parts, except by premeditated and malicious intention.

Projection of a Panel Mine*

By Guy E. Greer†

SYNOPSIS—A properly designed panel system provides a large tonnage from a small working area, largely prevents squeezes and localizes them if they occur and provides an ideal ventilating system.

This paper is based on a projected system of panel working, the tract of coal consisting of 991 acres, presumed for convenience to lie in Braxton County, West Virginia. The projected work is presented mainly for the purpose of inviting discussion on the merits of the panel system as applied to the Pittsburgh seam of coal.

On paper this system, with the rooms advancing and the pillars retreating, has almost everything in its favor, as opposed to the hit-or-miss principle of driving rooms and entries. The advantages may be briefly summarized as follows: Better control of the ventilation can be secured, and from the fact that each panel is practically surrounded by airways, the ventilation can be altered to suit almost any possible condition; the gases and powder smoke from each panel are carried directly into the return airway and are not circulated through other parts of the mine; fires or explosions are more likely to be confined to the panel in which they occur; squeezes are in a great measure eliminated, and if they do occur, they are more easily handled because they are confined to one panel; the output of coal may be better regulated, and the work concentrated so that the organization is more efficient.

Inasmuch as the method of operation discussed implies working the ribs as soon as the rooms are driven to their limit, it follows that cleaner coal will be obtained; also, since the roof is not permitted to stand for a great length of time, the expense of timbering is reduced.

Only One Roof Break Needed in Each Panel

The advantage of the panel system is most apparent in the extraction of the coal. Each panel, as shown in the drawing, has 6 butt headings. The method of working specifies that the upper 10 rooms on No. 1 butt (see panel A) are to be worked first. When these are driven up, pillar work is ready to be started. At the same time the lower 10 rooms on No. 1 butt and the upper 10 on No. 2 butt are started. When the break line, gradually retreating, reaches the entry, the lower rooms on No. 1 butt and the upper rooms on No. 2 butt are ready to fall into line. The advantage of this plan of working lies in the fact that only one initial break of the sandstone need be made for each panel. It is this initial break that is often the dangerous and expensive feature of drawing ribs.

If the break does not occur within a reasonable time, the extra pressure on the diminishing ribs will crush the coal, the roof will become treacherous and the bottom will be likely to heave. This danger period is met once and for all in each panel after the break line is started. If a squeeze should result, all room work may be suspended, the squeeze may be localized and the proper measures taken to rectify the conditions, whereas in that system where all the rooms are driven up before any pillar work is started, a squeeze is far more difficult to control and cannot be prevented from spreading.

In a room-and-pillar system where a haphazard method of driving entries and rooms is followed, the men are scattered widely over the mine. This complicates the haulage problem and reduces the number of wagons which a driver or motorman can handle. Adequate supervision is also rendered difficult and expensive, and the tendency will be to slight this important part of the organization. This will inevitably result in waste of material, inefficiency of day labor and a small output for each miner. It is also a most prolific source of accidents and would be likely to promote dissatisfaction among the men.

Estimates 500 Tons and 40 Rooms to a Panel

In the panel system, however, the work may be concentrated, so that a large output may be secured from a relatively small part of the mine. After the first 20 rooms have been driven up and the break line is well started, 40 working places will be available in one panel. Assuming two men to a working place, if each mines four wagons of two tons each per day, an output of 640 tons may be secured from one panel.

Allowing for contingencies of all sorts, it will be safe to assume an output under normal working conditions of 500 tons per day for each panel. Thus the daily output of the mine may be made 1,500 tons by working three panels. In the meantime of course the entry driving is being carried ahead, so that the output will probably be more.

Practically the only disadvantage of the panel system is the fact that since entry driving may be slow some time must elapse after the opening of a mine before a large output may be obtained. This is a disadvantage that often prevents this system from being used. It is always desirable when starting a new mine to show a large output as early as possible. This has been provided for in the projected workings shown in the illustration. Sections 1 and 2 are purposely left free for "hogging" in order to secure quick development. These sections are near the opening and may be worked soon after the main entries are started.

From all the evidence obtainable the dip of the Pittsburgh seam in the section under consideration is slight and openings to the outcrop are easily made.

Specifications for Working the Coal Area

The main entries are to be six in number and driven on the butt. Entry A and the main right entries are to be four in number until panel C is reached. All the other headings should be on the two-entry system.

Ventilation is to be by exhaust, making intakes of all haulageways. In all cases half the entries are to be taken as intakes and half as returns. The returns are to be on the outside where there are more than two entries. Each panel is to have one split of air. A suggestion as to the ventilation is shown in the plan in panel C.

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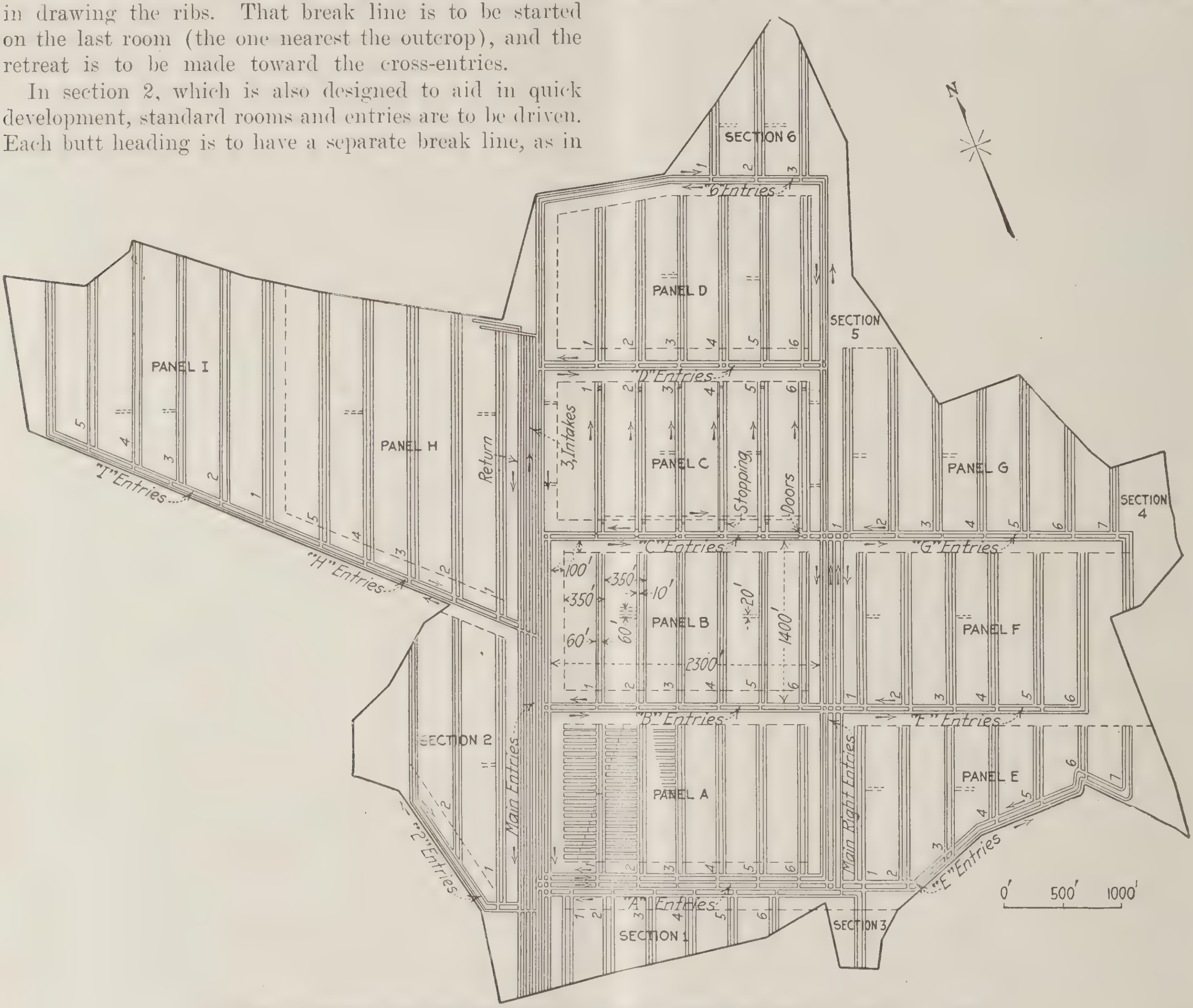
*Paper entitled "Projecting a Mine on the Panel System," read before the West Virginia Coal Mining Institute, at Fairmont, W. Va., on Wednesday, Dec. 8, in the Watson Building.

†Morgantown, W. Va.

All entries are to be driven on 60-ft. centers, with 10-ft. passageways and 50-ft. ribs. All rooms are to be spaced on 60-ft. centers, to be 20 ft. wide and to have 40-ft. pillars, but this rule is not of force for working out boundaries of irregular sections.

In section 1, which is for quick development, the rooms and entries are to be standard, except that the former may be turned to follow the boundary lines after the butts are driven up. In order to secure a quick output each butt heading is to have a separate break line in drawing the ribs. That break line is to be started on the last room (the one nearest the outcrop), and the retreat is to be made toward the cross-entries.

In section 2, which is also designed to aid in quick development, standard rooms and entries are to be driven. Each butt heading is to have a separate break line, as in section 1. Entry barrier pillars are to be withdrawn after working out the last ribs of the section.



A PANEL SYSTEM FOR PROVIDING A LARGE TONNAGE FROM A SMALL AREA

In section 3, standard rooms and entries are to be driven, the former being opened from both the entry and aircourse.

In section 4, standard rooms are to be driven from G, No. 7 aircourse, and from the butt heading, which is driven south from G, as shown in the drawing.

Section 5 is to be worked in connection with the removal of the main-right-entry barrier pillars. Standard rooms are to be driven from the main-right haulage.

Section 6 is to be worked on the retreat after panel D is worked out. Standard rooms are to be driven and the break line started after the completion of the last room of No. 3 butt.

Panel A is to be worked on the advance. Standard rooms are to be driven and a break line started upon the completion of the last room in No. 1 butt, as shown in the drawing. Panels B, C and D are to be worked on the advance as panel A, while panel E is to be worked on the retreat. Standard rooms are to be driven and a break line started upon the completion of the last room in No. 7 butt. All barrier pillars are to be withdrawn.

Panels F and G are to be worked on the retreat just as panel E. All barriers are to be withdrawn after the ribs are extracted in section 4. Panel H will be worked on the retreat. Standard rooms will be driven and a break line started upon completion of the last room in No. 5 butt. If necessary or desirable for quick development, entries may be driven along the outcrop on the north side of this panel. Barrier pillars are to be retained.

Panel I is to be worked on the retreat, as panel H. All barrier pillars are to be withdrawn, including those between panels H and I and the entry barriers of panel H.

All the remaining barrier pillars are to be withdrawn after all panels and sections are completed, taking in succession the main right, D, C, B and A and main entries on the retreat.

Continuous Face Haulage

By J. F. K. Brown*

SYNOPSIS—A system of rope haulage is here described that is continuous, handles about 600 tons per day and may be easily advanced as the workings progress.

The expression "face haulage" would indicate a means of disposing of the coal output from the working face by a haulage system so flexible as to be capable of rapid extensions. The system described hereafter as conforming to these particulars and which has been used as a means of transportation at the face for many years has the following special points of interest:

(1) The tonnage handled is large, 600 tons per day. (2) The system is of the endless-rope type, the empty cars entering the section at one end and the full ones leaving at the other. (3) Cars can be taken off at any point along the rope, and full ones attached. (4) This system has been used in both room-and-pillar and longwall mining. (5) The haulage can be operated around corners of a right angle and less at a radius of 3 ft. (6) The cars will leave the rope automatically at any point selected.

As originally developed the system was designed for pillar-and-room working and was only afterward adapted to longwall. The first factor to be noted is that this system, like the operation of coal cutters, has to have the operating section laid out to suit the haulage, and no success need be anticipated if the attempt should be made to transplant this haulage method into just any section, anyhow. Fig. 1 shows a typical section and the one in which the system was partly developed. The great regularity and evidences of design in the laying out and working of rooms and pillars are the principal points of interest. To lay out and keep up to the mark in operating such a working section should be neither an effort nor an extra cost to the engineering staff of any coal mine.

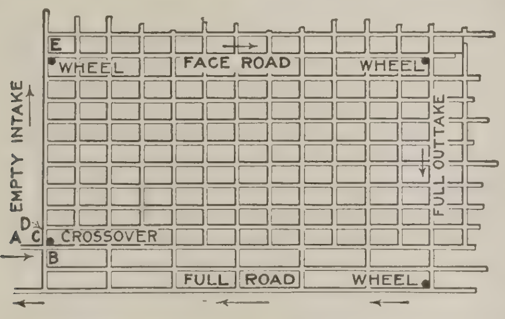


FIG. 1. GENERAL LAYOUT OF THE HAULAGE SYSTEM

It Paid To Plan Carefully

From experience in the particular mine described it was found that it paid well to have and to maintain this regularity. There was the direct benefit in cheaper haulage, ventilation was much simpler, break was more regular and dependable in working back the roof, the same roads in working back could be used again as haulage roads, turns, points and crossings were all standardized and rail lengths were always maintained the same, thus making less cost in the blacksmith shop.

Rooms were maintained at a width of 12 ft. and pillars 60x40 ft., the position of the room being laid off by measurement, and the alignment kept by roof lines. Every third road was held as a haulage road, hence the distance which the miner had to tram his coal never exceeded 140 ft., and as all the roads went through together and in line, there was never any delay in adding to the rope and transferring the haul to the new road. This change was usually accomplished during the night, a spare set of wheels being kept at hand and built in, in readiness for the removal.

From the illustration it will be seen that the various roads are referred to as the empty intake, the face road, the full outtake and the full road; the full outtake and the face road are the ones on which coal is attached to the rope. The haulage is a side-rope system with the rope on the side of the cars farthest away from the working places, while the turns are always to the right in the direction that the rope is running. It is only on a turn of this type that the rope can remain constantly attached to the car, as at any turn in the opposite direction the car has to leave the rope itself and be reattached by hand at some point round the corner. In Fig. 1, such a turn is shown at *B* and is known as a cross-over turn. Cross-over turns are to be avoided, if possible, since they require an attendant.

Locating the Turn Outs

In operation the rope with its complement of cars attached at regular intervals enters the section at *A*, Fig. 1, and travels round the cross-over turn at *B* and round the turn at *E*. From this point right across the section in every second or third road "turn outs" are laid, that is, points and crossings whose directions of approach to the main tracks are the same as is the direction of the cars on the main road. Sometimes these "turn outs" are connected with "back lyes," parallel roads to the main track, which are used as sidings for storage of pit wagons.

At first it was left to the miners themselves to tram their cars to the road and attach them to the rope, taking off an equivalent number of empties. Through time, however, it was found that this sometimes led to unequal distribution of the cars available and that the men at the beginning of the section managed to get their day's work finished much in advance of the men at the outward end.

As a result six boys were taken on, known as "drawers," whose duty it was to see that a proper distribution of cars was made at each turn out and to see that the last man in the section was fairly treated in the matter of getting pit wagons for his coal. These six lads did all the taking off and hanging on of the cars, and it was after their commencing work that the storage tracks were built in order to allow provision of enough cars to keep the men going while the drawers were at the other end of the section. At *E*, Fig. 1, the rope turned into the full road and so ran without further attention to a point where the cars automatically left the rope and ran to a collection point for an outside haulage. Four face haulages of this type landed their loads at this one point.

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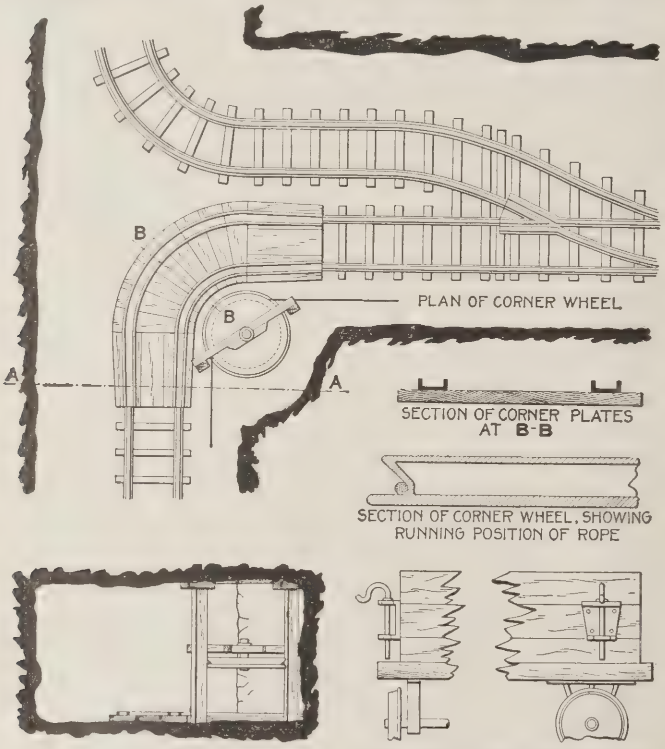
*247 Esplanade, Sydney, Nova Scotia.

The cars are regularly spaced when being attached to the rope at an average distance indicated by a hammer bell. Too close spacing results in wrecks wherever there is a hollow in the road. This is because the tightness of the rope causes it to lift out of the holder, thus leaving the car on the road for the next oncoming one to strike, and perhaps butt off the track. Spacing too far apart has the same effect, except that the accident then results in the weight of the rope upending the empty car; but a long length of empty rope can be run around the section provided several cars are dispatched together and not a single one at a time. The better plan when the supply of empty cars for the rope gets slack is to insist on regularly stopping the haulage until the cars needed are available.

Attaching the Rope to the Car

The rope is attached to the car by the jigger and holder shown in the drawing, and the height from the floor to the rope when in the jigger is 21 in. As the jigger is free to turn in the holder, there is some lateral play between the rope and the box, and this causes a greater grip to be exerted automatically between the rope and jigger at places where it would be most needed, such as a pull uphill. Detaching is attained by suddenly lowering the rail level a few feet in front of a pulley to which the rope is at the same time being raised.



PLAN OF CORNER WHEEL

SECTION OF CORNER PLATES AT B-B

SECTION OF CORNER WHEEL, SHOWING RUNNING POSITION OF ROPE

SECTION A-A

ROPE JIGGER AND JIGGER HOLDER

DETAILS OF ENDLESS ROPE HAULAGE

FIG. 2. SOME DETAILS OF THE HAULAGE SYSTEM

Usually the cars are being drawn up to this point, and the mouth of the jigger is ahead of the car box, but at the point where the level changes the cars run forward, bringing the jigger square and into a position at which the rope is more easily detached. It can then lift itself clear. In some cases where the jigger has become worn and sticks to the rope, it is simply lifted clear of the holder entirely and, running with the rope, comes against a heavy wooden cleat, in this way being knocked off the rope before the latter goes round the pulley. In detaching the cars in the workings all that is necessary is simply to lift the rope out of the jigger and quickly drop it to the side.

The passing of the cars round the acute turns is managed by the aid of the corner plates and the turn wheel, as illustrated. The jigger runs on the rim of the wheel and drags the car round in the channels; these narrow up at the end so as to guide the wheels onto the rails. Care has to be taken that the wheel is properly set and the correct height above the rail level maintained. The wheel should run parallel with both tracks, and the take-off of the rope should be easy. The haulage tracks require to be well laid to the roof lines, and of course to proper gage; while at the turns, the turn plates and rails should be well stayed.

The following particulars of a typical installation will be interesting:

Number of miners in section	98
Number of tons per man	6
Number of men per place	2
Cars per day	860
Tons per day	600
Weight per car	14 to 13 cwt.
Tare of car	4½ cwt.
Size of car	4x2x3 ft.
Rails handled in 12-ft. lengths	weight 24 lb. per yd.
Gage of road	24 in.
Rope, plow-steel	weight ¾ lb. per ft. and 2½ in. in circumference
Height of coal	72 in.
Nature of roof	Good, sandstone

Nature of section, flat, little water, good roof and floor, coal easily mined, roof weight helping considerably.

Grade, practically horizontal, about ½%.

Labor in Section	Wages per Day
Deputy, at $3, for one-third time	$1.00
Haulage man, at $2.50	2.50
Six drawers, at $1.75	10.50
Two roadmen, at $2, for one-half time	2.00
One boy, at $1.50	1.50
One night roadman, at $2	2.00
Shifting and haulage cost, about $210 a month, per day	3.50
Total	$23.00

Of these only part time of the roadmen and very little (about one-third) of the deputy's time are charged against the haulage, which gives a cost on the tonnage named of 3.83c. per ton. The distance traveled is 2.08 mi., which works out at a rate of 1.84c. per ton mile, which for a face haulage compares most favorably with the largest and most permanent of endless-rope haulages.

Rolls in the Floor Are Serious Obstacles

This system has its drawbacks of course, and the main one is on account of rolls in the floor. There is no difficulty in this provided the rolls encountered are long and not so sharp as to cause abrupt changes in the relative height from the floor to the rope, but should this occur, the rope does not get the chance to adjust itself to the ups and downs of the strata. As a general rule the more coal it is desired to handle the flatter the seam must be since the cars must be run closer.

A haulage system of this type with only a small tonnage depending on it can be manipulated over an undulating floor, since the cars in this case can be kept far apart. Too heavy a grade is also detrimental to smooth working, and about 8 per cent. represents the limit. With a higher grade than this trouble develops at the turn wheel, where the direction changes from the level to the down grade. Every time a car comes round the wheel, it suddenly runs forward with a vicious jerk and more often than not throws itself off the road and rope as well.

This haulage, however, possesses many worthy advantages and, provided it is applied under suitable conditions, is an economical and handy method of transportation.

Relation of the Mine Official to the Consumer*

By R. Z. Virgin†

SYNOPSIS—The mine official should view the coal sales from the viewpoint of the consumer, and he would then be more careful in supplying well-prepared coal of a size such as the consumer desires and tight, clean and easily unloaded cars delivered regularly as ordered.

There is a necessity for a new note to be sounded by mine officials if they would be successful. They should realize that in strictness they are not working in the employ of the company which has engaged them, but ultimately for the consumer who in the end pays all bills. His money keeps the industry going, and when the customers cease coming, the mine usually stops running.

Business stays only when care is taken of it. Give it more assiduous attention than the other fellow, and the result will be that all will have "quality coal" to sell and the consumer "quality coal" to burn and not bone, slate and other impurities. The customer will then have fewer clinkers, fewer ashes, cleaner grate bars and more efficiency.

The quality of the coal should be regular and therefore dependable, and the service rendered the consumer should be the best. The slow, inactive, indecisive and unconcerned mine official who has no thought of anything but quantity and cost and who entirely ignores the customer's requirements must sooner or later drop from the ranks of the leaders. For the customer's rights should always predominate. He knows what coal and service suit him best, and his rights to these preferences should not be abridged by the mine officials.

Every mine official who can arrange affairs at the mine so as to give the customer the service, quality and quantity he wants makes his company a reliable concern, and the consumer begins to bank on the shipper's service. This means more orders, more profits and better standing for the mine official.

Ascertain Consumer's Unloading Facilities

If possible, get the consumer to give you an idea of his unloading facilities, so that when he orders his car of coal you may know that his bin or siding will accommodate the equipment in which the coal is forwarded. In small plants and factories and in cities where storage is a factor, the length and height of the cars are important items to consider. It is necessary also to ascertain under what conditions the coal is used, the kind of place in which it is unloaded and what facilities are available. It is not well to send a 50-ft. car if the consumer's siding is only 40 ft. long, or a hopper car if the warehouse is suited only to a gondola.

If the consumer wants a car every alternate day, don't send him two cars and then skip three days and send him another. He might have to pay demurrage. The orders to the tipple-loading crew should be made flexible enough so that these men could select the coal for different customers in a manner that would suit their purpose.

For example, screened coal for use under a boiler need not be as large as coal going over the same screen to be used for domestic trade, where it is mostly used in stoves. After the tipple foreman has had much experience, he can detect a trip coming from the mines which has been dug by pick and can distinguish pillar coal from that which is mined and loaded after being cut by machine.

Mine officials should not argue with a customer. Adjust his grievance to his satisfaction, and if his business is unprofitable to you, tell him so frankly. An argument with a customer which led to a dispute over a matter of adjustment amounting to only $1 lost a coal company a profitable contract which it had enjoyed for several years and which was procured by mail-letter solicitation.

The coal should be primarily prepared at the coal face, and this preparation should continue until the fuel is screened and loaded. It is necessary to impress on those making the final inspection that the permanency of their jobs depends on the elimination of impurities.

Cars should be thoroughly cleaned and the holes roughly mended, so that shipments will reach the customer safely.

Careless Car Repairing Hinders Unloading

The repair used must be such that it will not inconvenience the customer in unloading the equipment. Heavy planks and pit rails should not be used to support drop-bottom doors, as a weight of 25 or 30 tons of coal on these planks makes them too tight to remove. If no planks are put in, no one need get under the cars to open the doors and no accident occurs from this cause. At the tipple a supply of quick-repair links, open links and a few bolts should be kept. Don't attach an engine to tighten hopper bottoms; perhaps the consumer has no such equipment to unfasten them.

An instance can be cited where a car had been used for hauling pig iron. Some of the iron froze to the floor, and when the car dropper loaded the car, he did not remove the iron because it was frozen fast. But the warm coal from the mine thawed the pig iron so that it became loose, and when the customer unloaded what he thought was merchantable coal, the pig iron with the coal fell into a crusher, and rolls costing over $200 were broken and the operation of the plant was delayed for several days because it was impossible to supply the stokers with the coal of the right size.

See that cars are properly routed so as to avoid expense, delay and disappointment in delivery to the wrong siding. If you do not have the equipment the consumer wants, advise him; don't send him a hopper if he wants a gondola unless he gives his consent.

Give the customer a correct billing of weights. If estimates must be made, try to get as close to the truth as possible, as overestimates will recoil. The figure you enter as the weight should be based on the average of several cars of the same class loaded with the same size of coal.

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*Paper entitled "The Relation of the Mine Officers to the Consumer," read Dec. 8 at the meeting of the West Virginia Coal Mining Institute at Fairmont, W. Va.

†Superintendent, West Virginia-Pittsburgh Coal Co., Locust Grove mines, Colliers, W. Va.

If the customer inquires about a car or shipment, be courteous. Give him all the information available and don't say, "Shipment went forward as ordered, and it is now up to the railroad to make delivery." Speak kindly; a little interest in the consumer's needs costs but little.

The high-powdered, high-priced salesman with a glib tongue may secure the first order, but the continuance of the business is in the hands of the mine officials. The very lifeblood of the mine depends on the grace of the customers, and a paying plant covers a multitude of sins.

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Photographing an Explosion

By John Pelligrino*

The accompanying photographs show an explosion which occurred on Nov. 13, 1915, at mine No. 7 of the McCormick Coal Co. (operated by the Sheridan Coal Co.), about 1½ mi. southeast of Arma, Crawford County, Kan.

This mine is 224 ft. deep and struck coal in January, 1915. The coal bed worked is about 3 ft. thick. The main entries run east and west and are now about 1,000 ft. long. The third set of entries are turned on the east side of the mine. Operation is on the room-and-pillar system, and about 150 men are employed. The coal is hauled to the bottom by mules and is raised on self-dumping cages by a steam hoist. The mine produces 500 tons of coal per 8-hr. day.

Some marsh gas is found every morning by the fireboss, whose duty it is to examine carefully every working place with a safety lamp and to dilute and render harmless such gas as is found.

I was notified on Nov. 13 that an explosion had occurred the day before at the mine which did not damage it very much as it was operated on that day. On Nov. 13, however, the barometer was falling low, and as weather conditions were favorable for an explosion, I decided that I would try to take a real photo of a mine explosion if one should occur that day. Immediately on arriving at the mine I prepared my kodak at a suitable place on a dirt dump about 75 ft. from the mouth of the shaft.

Owing to the dangerous conditions existing in this mine the Sheridan Coal Co. has installed a Schietzel electric shotfiring device. This explodes the shots at a time when all the men are out of the mine; consequently nobody's life is endangered while firing shots.

The miners prepare and tamp their shots and attach them to the electric wires, which are in each working place. About a half hour after quitting time, when all the men are checked out of the mine, the electrician in charge of the shotfirer explodes the shots by firing one entry at a time. There are therefore from 30 to 65 shots to be fired simultaneously in each entry.

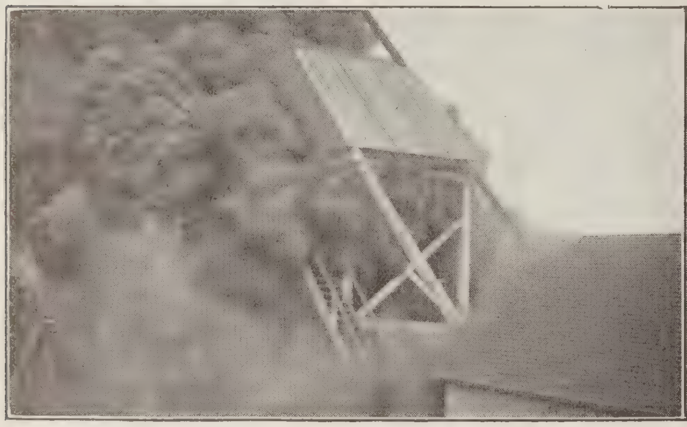

FIG. 1. THE MINE EXPLOSION

FIG. 2. TWO MINUTES AFTER EXPLOSION

On account of it being payday the mine only worked until 12 o'clock and the electrician commenced firing about 12:35 o'clock. He fired six entries without any trouble, but as soon as he threw the switch for the seventh

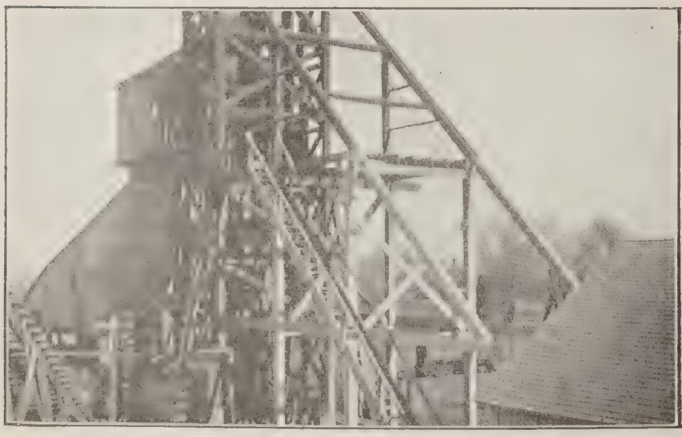

FIG. 3. THE TIPPLE UNOBSCURED BY SMOKE

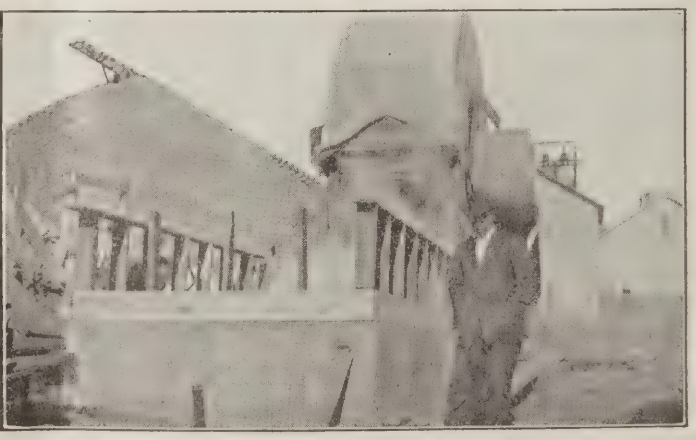

FIG. 4. FANHOUSE WRECKED BY AN EXPLOSION

entry the explosion occurred. I could hear a rumbling noise and a sound like a cannon going off. At the same time fire and smoke belched out of the mine, chunks of coal, timbers and boards commenced flying, while the dense smoke that enveloped the tipple and the noise of the timbers and boards cracking made it appear to me as if the tipple was falling over.

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*State mine inspector, Pittsburg, Kan.

There was one cage hanging in the circles at the time the explosion occurred, but the force threw it out and wedged it tight above the circles. The smoke and fire went up in the air for about 500 ft., and it looked like a burning oil well. The smoke hung around the mine for about an hour after the explosion.

Fig. 1 shows the explosion at the moment it appeared on the surface. Fig. 2 was taken about two minutes after the explosion. Fig. 3 was taken on Nov. 23 from the spot where I snapped the explosion on Nov. 13. Fig. 4 was taken on Nov. 23 and shows how the roof of the fanhouse was blown off by another explosion occurring at this mine on Nov. 22.

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Extracts from a Superintendent's Diary

Today we were honored by a visit from a man of whom none of us had ever heard. He introduced himself as a large stockholder of our company and informed us that the object of his visit was to see how the company was carrying out its moral obligations. He said that he was not personally acquainted with any of our directors, and that he had inherited his interest in our company.

He said that his block of stock was not large enough to give him voice in the company's management, no matter what his inclinations might be, but as he felt it to be his duty to at least post himself on the affairs of the company, he had decided upon today's visit.

I took him in hand personally and conducted him all over the property, both inside and aboveground. Then I introduced him to some of our most intelligent miners and company men. And finally I took him all through my residence and also the homes of several of our miners.

Then we went back to the office, and he began to ask questions, which I answered to the best of my ability.

By profession he is a college professor, and all of his ideas about labor problems have been obtained from books and magazines. His vocabulary was full of such terms as collective bargaining, minimum wage, paternalistic tendencies and industrial democracy. Sometimes I felt inclined to give him the kind of answers he so evidently expected rather than to suggest that no one within my knowledge could give him the information he sought, based on actual experience, but I managed to curb my inclinations somehow.

I attempted to explain to him that my convictions about labor unions and labor leaders were subject to frequent change, but he could not understand how such a thing could be possible, and it soon became evident that to his mind every attack that had ever been made on any labor leader was made from "whole cloth" behind locked doors at some employers' association. That any manager could voluntarily and of his own volition choose to give his employees a square deal was beyond his comprehension. Again and again he made use of the phrase "exploitation of labor," and it was evident that he believed that all labor lived but to be exploited.

Seeing that nothing could be gained by discussing things most intimately connected with my everyday life, I led him off into a discussion that had to do with stockholders. It had always seemed to me that inasmuch as the stockholders received all of the profits that were to be had, some of them ought to be gracious enough to tell the world at large that they appreciated profits and were glad that they could be obtained regularly with so little trouble.

But my ideas were not the ideas of my visitor. He believed that because of the fact that the management of a company rested solely in the hands of company officials, who were not under the control of the stockholders, but reported only to directors, it was unreasonable to suppose that the wishes of the stockholders were given serious consideration. How could he prove it? Why, that was dead easy—stockholders consisted of all classes of people from ministers to gamblers and from bankers to bootblacks, and surely the majority of them would not countenance the exploiting of labor. I couldn't get beyond that. Whenever anyone intimates that I am an exploiter of labor, I have to change the subject or lose my temper, so I am still ignorant of a possible motive that leads company managers to wring profits from their employees to be turned over to stockholders who resent the necessity of receiving them.

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Mine Officials' Brotherhood

About a year ago a movement known as the "Mine Officials' Brotherhood" had its beginning in a convention of mine officials held in the City of Dubois, Penn. The membership of the organization thus formed has since been steadily increasing.

A second convention was held July 28, 1915, at Reynoldsville, Penn., at which the following were elected: James Ewing, president; John B. Morton, vice-president; G. S. Stewart, secretary-treasurer; H. H. Moody, George Alexander, George N. Blackley, William E. Richard and S. E. Clark, board of directors.

The organization receives into membership mine inspectors, superintendents, foremen, firebosses, assistant foremen, mining engineers, surveyors and assistants. In the last year two deaths occurred in the membership, for which assessments of $2 per member were made. The enrollment fee is $3, and the quarterly dues $1, payable every three months. The objects of the organization are:

1. To accumulate a fund so that at the death of a member the order will eventually pay to beneficiaries a sum not to exceed $2,000. At present the amount paid on the decease of a member will be equal to an asesment of $2 for each member in good standing. When the membership reaches 1,000, the full sum of $2,000 will be paid.

2. To maintain a closer relationship between mine officials and operators the organization will endeavor to keep its members in touch with operations where foremen or other officials are needed and will at the same time furnish operators with a list of available experienced men.

These objects should meet with the hearty approval and support of all operators and mine officials. The order especially wishes to call the attention of the mine officials in the anthracite field to this order and ask them to join with it in the bituminous field to swell the ranks and influence of the organization. Any desired information will be cheerfully given by the secretary.

Who's Who in Coal Mining

C. B. Dougherty

Thirty-six years ago C. B. Dougherty came into the office of the Susquehanna Coal Co. and took a position about as low in the scale of office work as it was possible to get. He was 18 years old when he became an office boy. He is older now, 18 plus 36, and he is still in the office of the Susquehanna Coal Co., but his title has been changed to assistant manager. That old saying about the "rolling stone" seems to have been a pretty good motto in this case.

In the summer of 1885 he was made chief clerk in the manager's office when Major Irving E. Stearns became general manager of the anthracite interests of the Pennsylvania R.R. (It ought to be said that the railroad and the coal company are no longer associated as they formerly were.) In his position as chief clerk he organized the purchasing department of the coal company. Before this time all purchases had been made by the individual collieries. He still takes an active interest in the operations of the purchasing department.

GEN. C. B. DOUGHERTY
Assistant General Manager, Susquehanna Coal Co.

In July, 1906, he was advanced to the position of assistant manager. All colliery operations are directed from the office of General Manager Quinn, and as assistant, General Dougherty has a share in the management of all departments.

Few men have been connected with the administrative side of anthracite operations for so long a time as General Dougherty, and many have been the changes that have come under his notice. To him the most notable change is that slow one from widely scattered private ownership to more concentrated corporate ownership, with the resulting change from entire lack of coördination in the activities of producers to some approach to order and regulation. Perhaps this is especially apparent to him in the operation of the purchasing department, for it is a long step from individual purchasing at each of many collieries to the purchasing for a large corporation at a central office, and probably there is no place about the operations where the economy of central management would be shown more clearly.

Here is another record, quite different but still that of the same man. Mr. Dougherty entered military life as a private in Company B, Ninth Infantry, in 1881. He was soon made regimental clerk, and a year later he became principal musician. In 1883 he was appointed sergeant major and reappointed in the two succeeding years. In 1887 he became first lieutenant and inspector of rifle practice. In 1892 he was elected major in the Ninth Infantry, and 1894 he became lieutenant colonel. In 1897 he became colonel.

In 1898 the regiment was mustered into the service of the United States. For a considerable time Colonel Dougherty was in command of the Third Brigade, Third Division, First Army Corps, and was in command when his regiment was mustered out.

In 1899 the regiment was reorganized and reëntered the service of the National Guard of Pennsylvania. In 1906 Colonel Dougherty was appointed brigadier general, and in 1901 he was appointed major general to command the division.

General Dougherty is a thirty-second degree Mason, a member of the Westmoreland and Franklin Clubs of Wilkes-Barre, the Scranton Club, the Engineers' Society of Northeastern Pennsylvania, the Wyoming Valley Country Club, the Pennsylvania Society of the Sons of the Revolution, the Military Order of Foreign Wars and the Naval and Military Order of the Spanish American War. He was first state commander of the last organization. He is serving his third term on the State Armory Board. For three successive years he has been president of the National Guard Association of Pennsylvania.

In spite of all this he finds time to do his work for the coal company, read the *Atlantic Monthly* and live up to his reputation as a tip-top good fellow and a friend worth knowing.

Invention for Safety First

An invention to be used for the motion-picture campaign in behalf of "safety first," which has been initiated among its anthracite miners by the Delaware, Lackawanna & Western Railroad Co., is a projecting machine that can be used for either lantern slides or films with both direct current and storage batteries. This will enable the safety-first organizations of the company to take the pictures right into the miners' homes.

In addition to the safety-first organization of the officials of the coal-mining department there is a separate organization among the safety inspectors, driver bosses and firebosses, which holds its separate meetings and periodic discussions of the ways and means of preventing accidents.

While the increase in the use of electric lighting has been rapid in the anthracite region, there are still many miners' houses without electric wiring, and the new projecting machine—the only one of its kind—facilitates exhibitions in every community, whether supplied with electric current or not. It enables the safety organizations to show the miner's wife and children the perils to which he exposes himself if he is in any degree reckless, and the miners pay heed to these warnings. The company's motion-picture play entitled "The Price of Carelessness" is an impressive exhibition of this sort.

Editorials

Starting the New Year

Right now when we are on the eve of another year is the time to make new plans, with the idea of increasing our efficiency and thereby improving our prospects of success. The mistakes we have made are now entered on the ledger of experience, and our resolutions include a determination to avoid the same error again.

The Foreword in this issue of *Coal Age* suggests that we record our new resolutions and that we make them only after the most mature deliberation. The chief idea is to keep all our promises, for a good resolve broken is an act that will seriously impair the will. On the other hand a good resolution when kept produces a new habit, and a new habit soon becomes a part of oneself.

It isn't our own experiences alone that should profit us, but the experiences of others who have met and conquered the same problems we meet in our everyday life. For this reason the present moment is an excellent time to ponder on the wisdom of men who have succeeded.

It was Franklin who said, "Being ignorant is not so much a shame as being unwilling to learn." He was a plodder and was able to do so much mental labor because of the simple life he led. Like most great men who lived to an old age, he was a careful eater and a small one. He remarked once, "I have seen few die of hunger; of eating—100,000." It was also Franklin who wrote, "If you know how to spend less than you get, you have the philosopher's stone."

Of all the great merchants America has produced Marshall Field stands preëminent as a man who was not only a financial success, but who was a success from all moral and human standpoints. His twelve rules of life were:

Remember—

1. The value of time.
2. The success of perseverance.
3. The pleasure of working.
4. The dignity of simplicity.
5. The worth of character.
6. The power of kindness.
7. The influence of example.
8. The obligation of duty.
9. The wisdom of economy.
10. The virtue of patience.
11. The improvement of talent.
12. The joy of originating.

Marshall Field went to Chicago practically penniless, but he was determined to succeed and made it the rule of his life to keep away from all associates who might discourage him. He learned early in his career that the cornerstone of any honored life must be a good reputation.

If we don't avoid small faults, little by little we fall into greater. It isn't only the hours that we spend at our labor that influence our lives. The way in which we spend our hours of freedom either increases or decreases our personal efficiency. It should never be forgotten that the great combat of our lives is the fight to overcome ourselves. Therefore let us all write down our new resolutions, and let these new resolves cover those faults in our personal conduct that are keeping us back and in many cases dragging us down. There is nothing more terrible than the cry of the man in his old age—If I had only done the things I should have done.

"He missed his opportunities!" How often we hear this expression. No act or accident of a man's life is insignificant; the most trifling may be the germ of his destiny. Opportunities are not as common and frequent as milestones by the roadside; however, there is always something to be done that is awaiting the coming of somebody who can do it well.

* * *

Steam-Shovel Methods

When the United States Geological Survey published its "Production of Coal in 1913," there was no mention of steam-shovel mining, but in the record for 1914 this information is available. Of course only the concerns which are mining coal for sale have furnished data, and only the bituminous coal mines are included. But in these pits it is noteworthy that the ratio of cover removed to coal obtained is six to one. In Illinois the ratio is 3.86 only, but in Oklahoma, where the coal is only 22 in. thick, the cover removed is 10 times as thick as the coal uncovered.

Steam-shovel mining has been received with the utmost scepticism, but once adopted it has a way of spreading fast. There are now 48 shovels at work in the bituminous mines alone, 40 of these operating on the cover and 8 on the coal. The strip pits did not work quite as regularly as the average bituminous mine, the former working 187 days and the latter 195. But the output per man was large nevertheless. The average for all the strip-pit workmen was 945 tons per year, or 5.06 tons per working day. The average bituminous-mine worker last year produced only 724 tons, or 3.71 tons for every day that he worked. Both mine worker and strip-pit employee failed to reach a maximum yearly tonnage owing to the state of the market.

The steam shovel has come to stay, and there is no reason why it should be used only in Illinois, Kansas, Missouri, Indiana and Oklahoma. It is well suited to mining along the outcrops of hilly countries; it is available where coal is found in basins beneath prairie ground. The seams of coal now being uncovered in bituminous practice are thin, nowhere exceeding 6 ft. in thickness, and the cover removed is nowhere in excess of 26 ft., but there is nothing to prevent greater depths of cover from being shoveled away where the coal is thicker and of more value as in the anthracite region—nothing, that is, but the fact that the strip-pit industry is in its infancy and few seem disposed to give it the favorable consideration it deserves.

Conspiracies Against the West Virginia Coal Trade

Governor H. D. Hatfield spoke most forcibly at the recent meeting of the West Virginia Coal Mining Institute. He bitterly denounced those who protested against his pet legislative schemes. But is it not to be presumed that the coal operators of West Virginia have a right to protest even against a real governor if they think his schemes are opposed to their own or the public good?

We do not suppose there is any state in the Union where an outcry would not arise if a tax was about to be laid upon coal in that state and not in all those competing. Nor is it unnatural that coal operators who for two years have run their mines on a narrow margin are disposed to protest against more drastic laws. Moreover, it is permissible for operators to seek a workmen's compensation law which will not be too severe. But apparently Governor Hatfield thinks that protests of the kind mentioned are a veritable evidence of depravity.

There is no need for vehemence such as Governor Hatfield showed, nor any need at all for vindictiveness. There is a great need, however, for that broad cosmopolitanism that realizes that two thoughts entirely different and contradictory may be held without involving bitter controversy and suspicion.

In fact there are people in West Virginia today who regard as a conspiracy every act and the expression of every opinion inimical to them. They are particularly sure that this is true if the critic or the corporation does not reside in the state.

For instance, Colonel Dawson in his address before the State Board of Trade of West Virginia at Fairmont declared that he regarded the tearing up of sidetracks under coal tipples, the arbitrary refusal of needed cars and other like acts in the years 1900 and 1904 as evidences of a conspiracy in favor of Pennsylvania and Ohio and against West Virginia. But these same illegal acts were quite common at one time in Pennsylvania before West Virginia was an important coal-producing state. Perhaps because there were no West Virginia mines was why Pennsylvania operators put a different interpretation on the actions of the railroads and alleged that the cause of these remarkable interferences with business was that the railroad officials wanted a part in the development or the exclusive control of all the mines on the railroad. Only in West Virginia have these actions been declared to be attempts to enrich one state at the expense of another.

Then again Colonel Dawson declares that the Chesapeake & Ohio Ry. is willfully preventing West Virginia coal produced along its lines from reaching Eastern cities. A glance at the map would readily show why that railway demands rates which prevent the operators along its lines from competing in the East with the much nearer and equally desirable coal of the Clearfield, Cambria and Somerset fields of central Pennsylvania.

In fact the main conspiracy to which Colonel Dawson has referred may be found devoid of irregularity in a court of law.

It is hard to believe that in a free country it is a conspiracy to agree to ask a public commission to increase freight rates. Surely when that principle is established it will be a crime for citizens to meet and agree to urge the passage of a law. But it seems improbable that the Interstate Commerce Commission will allow railroad rates to be raised in West Virginia and in Pennsylvania, even despite the now more favorable attitude of the public. In fact it looks as if the whole project may fall to the ground and as if the matter is but a "colossal bluff" to induce Ohio operators and miners to relinquish their action before the Public Utilities Commission. The action alleged to have been taken in regard to Pittsburgh rates appears to confirm that view.

It only remains to regret that the air is filled with rumors of conspiracies, most of which are purely figments of the imagination. Colonel Dawson, who accuses the coal operators and miners of neighboring states of entering into a conspiracy and who declares that the Pennsylvania R.R. and the Pittsburgh Coal Co. are plotting together against West Virginia, also states that "the brass collar of the Pennsylvania R.R. and its allied interests must indeed be welded (sic) strongly around the neck" of *Coal Age*.

He does indeed protest too much. Many of his arguments that there is a conspiracy are in no way conclusive, and only one has direct reference to the present situation. It is more reasonable to believe that in the three states involved and in Tennessee and Kentucky also there is no desire to put anyone out of business. There is in all a disposition to remember that an established plant must not be wrecked by inconsiderate and sudden reversions even to an equitable ton-mile basis. The vested interests of the West Virginia people need much consideration, and none can object to any success they may have as a result of the excellence of their fuel, but by ton-mile rates of exceptional liberality they should not be allowed to overrun every state east of the Mississippi. The change in rates to prevent their continual absorption of the markets of other states might well be made progressive, say 5c. per year. In this way West Virginians could slowly conform themselves to altering conditions.

With these views some will find fault. None of us is infallible. We surely should be able, however, to argue out an issue of this kind without any expression of bitterness or any imputation of bad faith.

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Is this the kind of Christmas you are having in your house today? If it isn't, perhaps the fault is your own. Are you doing the best you can for the wife and kids? There is another Christmas coming next year.

Discussion by Readers

Purchase and Sale of Coal

Referring to the question of the purchase and sale of coal and the fluctuation in the price for different grades, as discussed in the last issue of *Coal Age,* page 1026, it might be of value to call attention to the practice of figuring relative prices of the different grades at the mine rather than at the destination. For example, one coal may sell at $1 per ton f.o.b. cars at the mine, while another coal considered to have a 10-per cent. greater fuel value than the first is sold at $1.10 per ton f.o.b. cars at the mine.

For the sake of illustration, suppose the consumer pays a freight of 70c. per ton. This freight is the same regardless of the quality of the coal. He therefore pays $1.70 per ton for the inferior coal at the point of unloading and $1.80 per ton for the better coal, which is a difference of only 10c. per ton, or 5.8 per cent. of the delivered price. This percentage of difference is still further reduced when the cost of unloading and delivering the coal to the firebox is considered.

In my opinion, the 10-per cent. better grade of fuel should be worth at destination at least 10 per cent. of the delivered price ($1.70), or 17c. per ton more than the inferior grade, making its price $1.17 f.o.b. cars at the mine. Even this method of estimating the price would take into account none of the economies of the better fuel by reason of the reduction in the labor required per horsepower yielded and the greater power furnished per dollar of investment.

Under the existing custom or practice, the higher the freight rate that a customer must pay on his coal the greater is the likelihood that the best fuel he can buy will prove the most economical in the end, as I know of no case where a coal dealer or operator computes his price on the cost of the coal at destination, as I have suggested. For the sake of comparison, suppose a dealer has two customers who pay 30c. and 90c. per ton freight rates respectively. Then, assuming the dealer has two grades of coal, one of which has a 10-per cent. better fuel value than the other, if the inferior coal sells at $1 per ton f.o.b. cars at the mine, the prices to these two customers for this coal at destination would be $1.30 and $1.90 respectively, while the prices of the higher-grade coal would be $1.13 and $1.19 per ton f.o.b. cars at the mine.

Here is a difference of 6c. per ton at the mine in the prices quoted to these two customers. This difference is based entirely on the difference in their freight rates, but no one can say that these prices discriminate against the man who pays the higher freight rate. It must be admitted, however, that a purchaser of coal often receives quotations from different districts involving different freight rates, and this further confuses the problem. In such case the buyer must estimate the relative merits or qualities of the different grades of coal offered and compare the price differentials, not as given f.o.b. cars at the mine, but as delivered to his coal bins. By so doing, I think he will often be surprised to learn how much cheaper a high-grade fuel sold at a higher price may prove.

We cannot blame the South American trade for standing so closely by the high-grade Welsh coal when we consider that the costs of transportation and handling together amount to several times the cost of this coal at the mine and, further, that all this cost is on a per-ton basis and not on a heat-unit or B.t.u. basis. It it conceivable that under such circumstances we might give away at the mine a mediocre coal and still our American neighbor would turn it down in favor of a high-grade coal for which he must pay $2 per ton f.o.b. cars at the mine. In so doing, we must allow he would show excellent judgment. So much per ton of coal at the mine is the logical way for the producer to sell his coal, and yet the system may often prove misleading to one who does not go into the matter thoroughly.

M. L. O'Neale, Supt.,
Coal City Mining Corporation.
Coal City, Ala.

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Correct Tipple Design

Referring to the letter of J. B. de Hart, *Coal Age,* Oct. 23, p. 683, the minor points to which he draws attention hardly merit a reply, being points in regard to which difference of opinion may exist in practice. However, for the satisfaction of interested readers I will offer a few brief explanations.

Mr. de Hart does not consider it good practice to have a topman act also as lampman in mines of 600 tons' capacity. Neither do I. Moreover, the mining laws of many states require that the topman be at his post a half-hour before the hoisting of coal begins and remain for a half-hour after it ceases, which would prohibit a topman from acting in any other capacity. It will be noticed that my article, *Coal Age,* Sept. 18, p. 450, reads, "Mines having a capacity not exceeding 600 tons, where the topman also acts as lampman," etc., which obviously does not recommend the practice.

However, there is nothing in the Mines Act of the Province of Alberta to prohibit such practice, and where the tonnage is low and comparatively few men are working, the topman can give out lamps in the morning and clean them after the men come out of the mine at night without in any way interfering with his duties as prescribed by the act. The handling of lamps, as thus suggested, has worked well in practice even to the replacing of injured lamps during working hours. No confusion has been experienced by reason of an injured lamp coming out of the mine without a check, which has been attached to the lamp given in its place, and responsibility for the damage has always been readily fixed.

There can hardly be a difference of opinion on the question of danger from spontaneous combustion owing to the storing of refuse from the tipple in the bins below the picking-room floor. These bins are only 7 ft. in depth and must be emptied at least once a day. The worst conditions in respect to bony coal could not introduce the danger of spontaneous combustion or even cause a perceptible rise of temperature in that time.

Whenever possible it is better practice to weigh mine cars at the shaft bottom. Such a system is being introduced in many of the larger mines, especially those using machines, and it presents no difficulties in respect to properly crediting each miner with his coal.

In Fig. 3 of my second article, Sept. 25, p. 502, by a draftsman's error the forward leg of the headframe is shown as approximately parallel to the resultant of the cable stress. But the reference to this point on page 450 of the first article reads, "The forward leg of which (A-frame) is carried down to the ground outside of the resultant of the cable stress."

While writing I would call attention to the fact that in Fig. 2, page 451, the left-hand chute leading from the valve and receiving hopper should have been marked "local coal chute" instead of "scatter pan."

M. L. Hyde, Managing Director,
Pembina Coal Operators, Ltd.
Evansburgh, Alberta, Canada.

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Output of British Coal Mines

Letter No. 2—Though I have not seen the paper read by Mr. Dean before the North of England Institute of Mining Engineers and referred to in the editorial, *Coal Age*, Nov. 6, p. 762, it seems to me that the statements made are far off the mark. One is led to suppose that the American coal operators are most farsighted and employ better equipment in their mines than the coal operators of Europe.

Conditions Existing in Welsh Mines

The reasons that more coal is produced per man per day in this country than in Great Britain are: (1) Because the coal here is almost universally blasted with powder. (2) The coalfields are better adapted for machine mining. (3) The coal is universally loaded into the mine cars with a shovel. Compare this with conditions as they exist in the mines of South Wales, where I gained my mining experience. In those mines all the coal is mined by pick, sledge and wedge except in the nongaseous mines of the anthracite field. No blasting powder of any kind is used in the gassy mines. Also, it is impossible to use coal-cutting machines there because of the slips in the formation, which lie at an angle of about 45 deg.

In all steam-coal mines the miner uses a coal pan to carry his coal from the face to the "box," or car, to be loaded. He only loads lump coal, the fine coal and slack being thrown back into the gob. If miners in this country had to contend with these conditions, their output of coal would be less than that of their brothers in Great Britain because, owing to the slips in the coal and the gas pressure that greatly assists the mining, Welsh coal is more easily mined than American coal.

The Question of Mine Equipment

The suggestion of building larger equipment is idle talk, as British mines are noted for their equipment, which is uptodate and serves their conditions. No wood is used to line the shafts or in the building of engine houses and boiler plants, except for doors and flooring. I recall one company that planned to spend £200,000 ($1,000,000) in the sinking of two circular shafts 1,050 ft. deep and 21 ft. in diameter. The engine at the hoisting shaft consisted of a pair of 32-in. cylinders, while the drum was 18 ft. in diameter. Two cars of coal were hoisted at a time, each car containing from 3,000 to 3,500 lb. of coal. The mine employed 1,400 men, 500 of whom were night men, although no coal was hoisted at night, these men being employed as laborers and in making repairs. It was expected to hoist 2,000 tons a day in this shaft. The same company had previously operated one house-coal and four steam-coal mines. I remember the balance sheet for one year showed an output from all these mines of over 1¼ million tons and an average profit of 48c. per ton.

Natural Conditions in the Mines

I want to ask why the companies should provide larger boxes for loading hand-picked coal. Would the miners load more coal? But the larger boxes would require greater labor in loading and handling. When working in coal from 6 to 7 ft. thick, a good miner will load from 4 to 5 tons of coal a day, but this is lump coal and not run-of-mine.

Again, it does not follow that if the seam of coal is thin the height of the entries and rooms is correspondingly low. I worked in one mine where the coal was 22 in. thick. It was over 2½ mi. from the entrance to the inside parting in the mine. The main- and tail-rope system of haulage was employed. I do not remember that I had to stoop once in this mine, and I am over 6 ft. tall. I used to stand full height above the rail in the room. When it comes to "brushing" roof or lifting bottom to make headroom, we cannot instruct the miners of South Wales. In this mine a man and a boy would load from 70 to 75 cwt. of run-of-mine coal a day. Was it not easier to load four boxes of 18 cwt. each than, say, two boxes of 36 cwt. or one box of 72 cwt.? As a fact, the size of these boxes is estimated from the output expected from each place.

The Underground Haulage

In view of these facts, it needs no argument to prove that "rats of mules or ponies" are not used in those mines. Indeed, no mules are used underground in South Wales. The British mining law is strict in requiring that sufficient height must be maintained on all roads for the passage of horses, and any rubbing of the horses or their harness against the roof or timbers in any part of the mine would mean the conviction of the guilty parties. The type of horses employed in these mines compares favorably with the mules used in any mines in Illinois, and it is safe to say that our operators can take lessons in the stabling, care and treatment of mine animals from the South Wales mines.

Regarding Ventilation

To the best of my knowledge and experience, the "union" does not interfere with the miner with respect to the amount of coal he can load. In regard to the mines of South Wales being extremely "warm," it must be remembered that the coal lies at a greater depth below the surface, where the natural heat of the strata cannot be entirely removed or overcome by a more perfect system of ventilation, were this possible. Welsh mines are equipped with most efficient fans, and the circulation and distribution of the air in these mines are in all respects uptodate. The water gage of 2½ to 3½ in. in those mines is not always the result of long aircourses or restricted area, but is owing to the circulation of air volumes varying from 150,000 to 250,000 cu.ft. per min. As early as 1887, and since then, the mining law of Great Britain has contained the following general rule:

> An adequate amount of ventilation shall be constantly produced in every mine to dilute and render harmless noxious gases, to such an extent that the working places of the shafts, levels, stables and workings of the mine, and the traveling roads to and from those places shall be in a fit state for working and passage therein.

Many miners who have worked in these mines and are now in this country can testify to the fact that, though much gas was generated in the mines, this law was strictly kept. The new mining law goes one step farther and reads as follows:

> An adequate amount of ventilation shall be constantly produced in every mine to dilute and render harmless inflammable and noxious gases, to such an extent that all shafts, roads, levels, stables and workings of the mine shall be in fit state for working and passing therein; and, in particular, that the intake airways, up to within 100 yd. of the first working place at the working face, which the air enters, shall be normally kept free from inflammable gas. . . .
>
> For the purposes of this section, a place shall not be deemed to be in a fit state for working or passing therein if the air contains either less than 19 per cent. of oxygen or more than 1¼ per cent. of carbon dioxide, and an intake airway shall not be deemed to be normally kept free from inflammable gas if the average percentage of inflammable gas found in six samples of air taken by an inspector, in the air current in that airway, at intervals of not less than a fortnight, exceeds ¼ [per cent.]

The law, however, provides for the exemption of a mine liable to spontaneous combustion by order of the Secretary of State on certain specified conditions. In all Welsh mines air leakages are reduced to a minimum. I fail to recall a single instance where less than two substantial wooden doors separated the intake and return airways, and frequently three separation doors would be used at the shaft bottom. The mining law provides that no two doors shall be opened at the same time in the same crosscut. These doors are built into a wall of stone or brick laid in mortar, and brattice cloth is nailed to the bottom of the door to prevent leakage at that point.

ELECTRIC HAULAGE NOT POSSIBLE

Electric haulage in the mines of South Wales cannot be considered, owing to the danger of explosion of gas and dust. In the investigation of the explosion at Senghenydd, it was thought that the use of 9 volts for electric signaling gave too small a margin of safety, since it requires but 13½ volts to produce sparking of the wires. The rope haulage in present use must therefore continue.

I cannot see that the size of railroad cars used in Great Britain has much to do with the output of the mines. In this country the railroads build practically all the cars, and the size of the car is made with respect to the average length of fall. While it is not uncommon in this country to haul a distance of 300 mi., the longest haul in South Wales does not exceed 30 or 35 mi. The operators in that country build their own cars to suit their particular needs. They consider there is an advantage in using a small car with side doors opening outward in the middle of the car, which facilitates the unloading of the car and reduces the amount of breakage of the coal. One can hardly conceive of a car more difficult to unload than the ordinary type of car used in this country. In Great Britain cars that are to be unloaded at the wharfs are provided with end gates, which are most convenient for that purpose. The breakage of the coal is an important feature there, since the price of lump coal is more than double that of screening.

I have worked in coal mines in both countries, and while my output of coal in Great Britain ranged from 2 to 5 tons per day depending one the thickness of the seam. I have loaded 15 tons per day in Illinois, at the same time drilling and shooting the coal and clearing away slate and timbering. This difference of output is evidently not in the mine equipment, for no expense was spared in either case; it is simply owing to the difference in the natural conditions of mining coal in the two countries. It is not for us to boast of our good heritage in this country; instead, let us learn from European operators to demand a fair price for coal and not permit competition to so lower the value of coal at the mines that we are said to give it away. We must acknowledge that operators in foreign countries are as uptodate in most respects as their American brothers. W. L. MORGAN.

East St. Louis, Ill.

"Dont's" for Mine Motormen

In addition to the list of "dont's" for mine motormen given by James Thomas Reynolds, *Coal Age,* Nov. 20, p. 840, and the two suggested by Edward H. Coxe, Dec. 11, p. 984, I want to suggest two very important ones, which are as follows:

Don't get out of your motor while it is in motion and run alongside of it to clean out the sand-pipes. In doing this you may come in contact with some obstruction at the side of the road or have your fingers or jacket caught under the wheels, which might result fatally.

Don't climb over the top of your motor while it is in motion in order to fix or clean your headlight. In doing so you may strike against the roof or come in contact with a low timber or wire and be seriously if not fatally hurt.

California, Penn. WILLIAM THOMAS JENKINS.

Efficient Mine Foremen

Letter No. 14—There seems no end to the practical mining questions discussed in *Coal Age.* I have been much interested in reading the discussion of the "Efficiency of Mine Foremen." The views presented by different ones who have taken part in this discussion agree thoroughly with my own observations. I have had experience with various kinds of mine foremen, and while some were all you could desire or ask, others were slack in discipline and careless and neglectful of their duties. Some drank to such an extent that they lost their positions, yet all of these men retained their certificates of competency.

There are foremen at the present time who are capable of managing mines successfully and yet are seeking work, while others are wholly unfit for the positions they hold. Many foremen expect too much of their assistants and leave too much in their charge that they should attend to personally.

I regret to say that the mine foreman is not generally valued according to his ability to produce results if one might judge from the pay he receives for his services. As has been said, mine foremen are often hindered in the performance of their duties required by law because of the lack of support given them by higher officials of the company. In the rapid advance of mining more is required of mine foremen and firebosses than formerly, as in many cases the territory in their charge is too large for them to give it the attention it should receive. The bituminous mine law of Pennsylvania requires that a second examination of every working place where men are employed shall be made during working hours by the fireboss. But how is this to be done if he is to give proper instruction to the men on his rounds? He is often delayed by assisting someone to lift a car onto the track or to sight an entry or by performing some other service that is needed. A Reader.

Burgettstown, Penn.

Claims Credit for Double Entry

I am pleased to notice the consolidation of the *Colliery Engineer* with *Coal Age,* giving us a weekly mining paper in place of a monthly. I want to refer briefly to an article published in the October issue of the *Colliery Engineer,* page 142, by my old friend, Walton Rutledge, on "Early Mining in Illinois."

In this article Mr. Rutledge shows the old method of single entry used so extensively in those days. A door was placed at the mouth of each room, and when a driver was gathering the cars for a trip, these doors were open half the time. As a result the air short-circuited at that point, passing through the open door, and the faces of the rooms outby on that entry were cut off. It was a miserable system of ventilation.

At that time I was part owner and general manager of mines at Brazil, Ind. In the early eighties I went to Staunton, Ill., to take charge of mines at that place. It was there that I saw the absolute necessity of employing double or triple entries, as the mines were poorly laid out and there was about 30 acres of old workings on fire and sealed with the poorest kind of stoppings. This was the first place where I planned and instituted the double-entry system, which was at once adopted quite generally throughout the state on what was, I believe, known as the "Morris plan." I sold maps of my plans, which were sent broadcast to many mines throughout the country. Many of these maps were sold by the *Colliery Engineer.*

I notice with some regret that Mr. Rutledge failed to give me due credit for the system. The panel system that he described is nothing more than double entries driven in blocks to the boundary line, the blocks being then cut through and the panels worked back, as in longwall retreating. William M. Morris.

Colorado Springs, Colo.

Study Course in Coal Mining

By J. T. Beard

The Coal Age Pocket Book

CONVERSION OF COMPOUND UNITS

In the conversion of compound units from the United States to the metric system, and vice versa, it is more convenient and saves much time and frequently avoids error arising from confusion of terms to employ a single factor. The following are the more common conversion factors:

WEIGHT PER UNIT LENGTH

1 lb. per ft	(0.4536 × 3.28)	= 1.488 kg. per m.
1 lb. per yd	(0.4536 × 1.0936)	= 0.496 kg. per m.
1 ton per mi	(0.9072 × 0.6214)	= 0.5637 tonnes per km.
1 long ton per mi	(1.016 × 0.6214)	= 0.6313 tonnes per km.

WEIGHT PER UNIT AREA

1 lb. per sq.ft	(0.4536 × 10.764)	= 4.882 kg. per m^2
1 ton per sq.ft	(0.9072 × 10.764)	= 9.765 tonnes per m^2
1 ton per sq.yd	(0.9072 × 1.196)	= 1.085 tonnes per m^2
1 ton per acre	(0.9072 × 2.471)	= 2.2417 tonnes per hectare
1 long ton per acre	(1.016 × 2.471)	= 2.5105 tonnes per hectare

WEIGHT PER UNIT VOLUME

1 oz. per cu.in	(28.35 × 0.06102)	= 1.73 g. per cm^3
1 oz. per cu.ft	(0.0283 × 35.3145)	= 1.00 kg. per m^3
1 lb. per cu.ft.	(0.4536 × 35.3145)	= 16.0184 kg. per m^3
1 lb. per cu.yd	(0.4536 × 1.308)	= 0.5933 kg. per m^3
1 ton per cu.yd	(0.9072 × 1.308)	= 1.1866 tonnes per m^3
1 ton per acre-ft	(0.9072 × 8.106)	= 7.3538 tonnes per hectare-m.
1 long ton per acre-ft	(1.016 × 8.106)	= 8.2357 tonnes per hectare-m.

It is worthy of note that **ounces per cubic foot** are equivalent to **kilograms per cubic meter,** or **grams per liter,** since 1 m^3 = 1000 liters.

WEIGHT PER UNIT CAPACITY—LIQUID

1 gr. per gal.—U. S.	(64.8 × 0.264)	= 17.107 mg. per l.
1 oz. per gal	(28.35 × 0.264)	= 7.484 g. per l.
1 lb. per gal	(453.59 × 0.264)	= 119.748 g. per l.
1 gr. per gal.—Gt. Br.	(64.8 × 0.22)	= 14.256 mg. per l.
1 oz. per gal	(28.35 × 0.22)	= 6.237 g. per l.
1 lb. per gal	(453.59 × 0.22)	= 99.790 g. per l.

WEIGHT PER UNIT CAPACITY—DRY

1 lb. per bu.—U. S.	(0.4536 × 28.378)	= 12.872 kg. per stere
1 lb. per bu.—Gt. Bt.	(0.4536 × 27.51)	= 12.479 kg. per stere

PRESSURE

1 oz. per sq.in	(28.35 × 0.155)	= 4.394 g. per cm^2
1 lb. per sq.in	(453.59 × 0.155)	= 70.306 g. per cm^2
1 lb. per sq.ft	(0.4536 × 10.764)	= 4.882 kg. per m^2

WORK

1 inch-pound	(2.54 × 453.59)	= 1152.1 gram-centimeters
1 foot-pound	(0.3048 × 0.4536)	= 0.1383 kilogram-meters
1 ton-pound	(0.3048 × 0.9072)	= 0.2765 tonne-meters

The Coal Age Pocket Book

WORK IN HEAT UNITS

1 B.t.u.—778 ft.-lb.	(778 × 0.1383)	= 107.564 kg.-m.
1 pound-calorie	(107.564 × 1.8)	= 193.615 kg.-m.
1 calorie	(193.615 × 2.2046)	= 426.844 kg.-m.

CALORIFIC OR HEATING VALUE

1 B.t.u. per lb	(0.252 × 2.2046)	= 0.55556 cal. per kg.
1 B.t.u. per lb	5/9 (2.2046)	= 1.22478 lb.-cal. per kg.
1 B.t.u. per cu.ft	(0.252 × 35.3145)	= 8.89925 cal. per m^3
1 lb.-cal. per lb	(0.4536 × 2.2046)	= 1,00000 cal. per kg.
1 lb.-cal. per lb		= 2.20462 lb.-cal. per kg.
1 lb.-cal. per cu.ft	(0.4536 × 35.3145)	= 16.01866 cal. per m^3

POWER

The metric horsepower (force de cheval), which for convenience may be abbreviated **"cheval,"** is the power capable of performing 75 kg.-m. of work per second, or 75 × 60 = 4500 kg.-m. per min.

1 horsepower	(33,000 × 0.1383)	= 4563.9 kg.-m. per min.
1 horsepower	(4563.9 ÷ 4500)	= 1.0142 chevals
1 cheval	(4500 ÷ 4563.9)	= 0.986 hp.

POWER FACTORS

1 sq.ft. per hp	(0.093 × 0.986)	= 0.0937 m^2 per cheval
1 cu.ft. per hp	(0.028 × 0.986)	= 0.0276 m^3 per cheval

FUEL OR WATER CONSUMPTION

1 lb. per hp.-hr	(0.4536 × 0.986)	= 0.4472 kg. per cheval-hr.
1 ton per hp.-hr	(0.9072 × 0.986)	= 0.8945 tonnes per cheval-hr.
1 gal. (U. S.) per hp.-hr	(3.785 × 0.986)	= 3.7320 liters per cheval-hr.
1 gal. (Gt. Bt.) per hp.-hr.	(4.544 × 0.986)	= 4.4804 liters per cheval-hr.

EVAPORATION FACTORS

1 gal. per sq.ft.—U. S.	(3.785 × 10.764)	= 40.7417 l. per m^2
1 gal. per lb. fuel	(3.785 × 2.2046)	= 8.3444 l. per kg.
1 gal. per B.t.u	(3.785 × 3.968)	= 15.0189 l. per cal.
1 gal. per B.t.u	(3.785 × 1.8)	= 6.8130 l. per lb.-cal.
1 gal. per sq.ft.—Gt. Bt	(4.544 × 10.764)	= 48.9116 l. per m^2
1 gal. per lb. fuel	(4.544 × 2.2046)	= 10.0177 l. per kg.
1 gal. per B.t.u	(4.544 × 3.968)	= 18.0306 l. per cal.
1 gal. per B.t.u	(4.544 × 1.8)	= 8.1792 l. per lb.-cal.

EQUIVALENTS IN AIR MEASUREMENTS

Atmospheric pressure, sea level, normal, 14.696 lb. per sq.in.

(14.696 × 0.0703) = 1.033 kg. per cm^2

(14.696 ÷ 0.4911) = 29.925 in. mercury

(29.925 × 25.4) = 760 mm. mercury

$\left(\frac{29.925 \times 13.6}{12}\right)$ = 33.9 ft. water column

(33.915 × 0.3048) = 10.34 m. water column

The specific gravity of mercury (32 deg. F.) being 13.593, 1 in. barometer (standard reading) corresponds to 13.6 in. water gage and, roughly, to (13.6 × 815) ÷ 12 = say 900 ft. air-column.

Inquiries of General Interest

Lifting Power of Hydrogen

(a) I would like to know how much a cubic foot of hydrogen gas will lift at a temperature of 60 deg. F. and a barometer of 30 in., assuming the gas is confined in a bag and disregarding the weight of the bag. (b) Is there any gas lighter than hydrogen? STUDENT.

Enterprise, Iowa.

(a) The lifting power of any gas is equal to the difference between the weights of equal volumes of that gas and air at the same temperature and pressure. Under these conditions a cubic foot of dry air weighs 14.418 times as much as the same volume of hydrogen. Then, since 1 cu.ft. of air at 60 deg. F., barometer 30 in., weighs 0.0766 lb., the same volume of hydrogen, at the same temperature and pressure, will weigh $0.0766 \div 14.418 = 0.0053$ lb. Therefore, the lifting power of hydrogen at this temperature and pressure is $0.0766 - 0.0053 = 0.0713$ lb. per cu.ft. of the gas.

Expressed as a rule, the lifting power of any gas per cubic foot is equal to the density of the air (weight per cubic foot) at the given temperature and pressure, multiplied by one minus the density of the gas referred to air as unity. Applying this rule: The density of hydrogen referred to air as unity is $1 \div 14.418 = 0.06936$. Then, multiplying the weight of one cubic foot of air at the given temperature and pressure by $1 - 0.06936 = 0.93064$, we find for the lifting power of hydrogen at this temperature and pressure, $0.0766 \times 0.93064 = 0.0713$ lb.

(b) No; hydrogen is the lightest gas known.

Wire-Rope Formulas

Referring to the solution of the problem on engine-plane haulage, *Coal Age*, Nov. 13, p. 816, will you kindly explain the method of calculating the size of rope required when hoisting in a shaft or hauling a trip up an engine plane? Is it possible to calculate the diameter of the rope required without referring to wire-rope tables?

In the problem to which I have referred the factor of safety of 5 has been used, and I would like to ask whether this means that the safe working load of the rope is one-fifth of the breaking load or that one-fifth of the breaking load must be subtracted in order to obtain the safe working load of the rope.

D. J. BOWEN.

Lafayette, Colo.

All rope formulas for finding the safe load for any given diameter of rope or the diameter required for any given load are necessarily empirical, being based on actual tests of wire ropes of different kinds and makes. It is impossible to calculate with accuracy the load a wire rope will carry safely for the reason that the strands of the rope and the wires composing the strands are twisted, and the stress in the wires is for the most part not parallel to the axis of the rope.

In the usual makes of rope in this country the wires in a strand form an angle of about 14 deg. with the axis of the strand and the strand makes an angle of 14 deg. with the axis of the rope. Hence, the axial stress in the wire is frequently at an angle of 28 deg. with the axis of the rope. As a result the axial stress permissible in the rope would be equal to the axial stress in the wire at its weakest point multiplied by the cosine of 28 deg. (0.883), which would make the safe load for the rope, say seven-eighths of the safe wire stress calculated for the entire wire cross-section of the rope.

There are, however, other considerations in respect to wire ropes in which the twisted wires are built over a hemp core, which make it impracticable to estimate the strength of the rope except by actual test. The makers of wire rope have made such tests, and the strength of different sizes and kinds of rope is best estimated from the breaking load of a 1-in. rope of the same type.

The following table gives the breaking load of a 1-in. six-strand rope for each kind of wire and style of rope. All ropes used in mining, with few exceptions, have six strands; but haulage ropes, requiring less flexibility and subject to greater wear from exterior abrasion, are generally made of seven wires to the strand, while hoisting ropes, requiring greater flexibility and being less subjected to abrasion, are made of 19 wires to the strand, these wires being of less diameter than those used in haulage ropes:

	Breaking Load of 1-In. Rope (Tons)			
	Iron	Cast Steel	Extra-Strong Cast Steel	Plow Steel
Haulage ropes, 7 wires..	16	32	37	42
Hoisting ropes, 19 wires	17	34	39	44

Two general formulas are used—the first for ascertaining the safe load L for any rope having a diameter d and using any factor of safety f; the second for finding the required diameter d for any safe load L and factor of safety f.

The factor of safety is always the ratio of the breaking load to the estimated safe working load of the rope. Thus when the factor of safety is 5, the estimated safe working load is one-fifth of the breaking load of the rope. The following formulas assume, what is practically true, that the strength of wire rope for the same kind of material and style of rope varies as the square of the diameter of the rope; thus,

$$L = \frac{cd^2}{f} \qquad (1)$$

$$d = \sqrt{\frac{fL}{c}} \qquad (2)$$

In these formulas the load L is in tons, the diameter d in inches, while the rope constant c is taken from the table for the kind and style of rope used. The factor of safety commonly used in mining practice is $f = 5$. However, for hoisting in deep shafts, on steep inclines or when ropes are used under particularly severe conditions of wear or erosion from the acid mine water, a higher factor of safety should be employed.

Examination Questions

Iowa Foremen's Examination, Des Moines, Nov. 9-10, 1915

(Selected Questions)

Ques.—An aircourse in a mine is 5x7 ft. in area and 5,000 ft. long. What horsepower would be required to drive a fan to supply air for 100 men, assuming the air requirement is 100 cu.ft. per man per minute and the fan has an efficiency of 65 per cent. Assume the coefficient of friction $k = 0.000000022$.

Ans.—The volume of air required is $100 \times 100 = 10{,}000$ cu.ft. per min. The sectional area of the airway is $a = 5 \times 7 = 35$ sq.ft., and the rubbing surface $s = 2\,(5 + 7)\,5{,}000 = 120{,}000$ sq.ft. Then, taking the efficiency of the fan as 65 per cent., as stated in the question, the horsepower required to drive the fan is

$$H = \frac{k s Q^3}{0.65 \times 33{,}000\, a^3}$$

$$= \frac{0.000000022 \times 120{,}000 \times 10{,}000^3}{0.65 \times 33{,}000 \times 35^3} = 2.87\, hp.$$

Ques—What advantages has machine mining over shooting off the solid?

Ans.—When mined by machine, a less weight of powder is required to break down the coal than when it is shot off the solid. In the former case the charge of powder is given a better opportunity to perform its work and there is less danger of the occurrence of a blown-out shot. A larger quantity of coal is produced per pound of explosive used. Also a larger percentage of lump is produced by mining the coal.

Ques.—If you were put in charge of a mine that was not properly ventilated although the fan was of ample size to furnish all the air required, what would you do to correct the trouble?

Ans.—First, examine carefully the plan of ventilation and note the course of the air current in its passage throughout the mine. The chief trouble is probably owing to the leakage of air through the stoppings. These should be carefully examined, and air measurements taken in the entry all the way from the foot of the downcast shaft to the last crosscut on each pair of entries or section of the mine. All obstructions should be removed from the airways and crosscuts, and all breakthroughs should be enlarged so that they will have an area at least equal to the sectional area of the airway. Wherever the air current does not sweep the working face, brattices should be built so as to conduct the air forward to the face of the room or the head of the entry. If abandoned places are found to be giving off gas, these should be properly ventilated or sealed off by air-tight stoppings. Wherever practicable, the course of the air current should be shortened and sharp bends and angles in the airway should be avoided.

Ques.—Explain how you would erect a permanent stopping, giving the reason for your selection of the material used in its construction.

Ans.—A permanent stopping should be built of material that will withstand the action of the air current and be sufficiently strong to resist the action of the roof. The choice of material will depend largely on conditions in the mine. Where suitable rock or slate is available, the stopping is often built by erecting a double wall of this material and filling the space between with road dust or other fine material at hand. Where good hard brick can be obtained at a small cost, it is often best to build the stoppings of brick laid in cement mortar. A single wall of brick 18 in. thick when well laid makes a good stopping. In building a stopping, the floor should be cleared so as to provide a level bearing and the ribs should be cut at each side so as to give a good joint. Any loose top should be removed and the stopping carried up to the roof and carefully sealed.

Ques.—If you were put in charge of a small mine and were required to do your own surveying and mapping, explain how you would locate the underground workings with respect to the surface and what system you would employ in putting up sights.

Ans.—The best method to adopt in connecting the underground survey with that on the surface is to use two plumb lines, one in each shaft, connecting these by running a traverse on the surface and underground. If the traverse is properly calculated, it will give the length and direction of the base line joining the two plumb lines, which forms the base line of the survey.

When running the survey underground, an approximate course is determined by observing the needle reading on two or more courses of the survey. The needle bearing is then corrected by the calculated direction of the base line of the survey, and this correction is applied to all the courses of the underground survey.

When it is not practicable to use plumb lines in two separate shafts, the course of the underground survey is found by dropping two plumb lines in the same shaft and determining the direction of the line joining them on the surface, which gives the direction of the same line underground. In the use of this method greater care is required to avoid error, as any slight deviation caused by the swinging of the plumb lines will be greatly exaggerated as the survey is extended in the mine.

Ques.—A fan driven by a steam engine supplies air in a mine through several miles of aircourse. A door is suddenly opened allowing the air to go directly from the air shaft to the escape shaft. Will the opening of this door cause any change in the operation of the fan? Give the reason for your answer.

Ans.—When the air current is short-circuited by the opening of the division door between the main intake and the return airway, the resistance of the mine is cut off, and as a result a larger volume of air at once rushes through the fan. This rush of air causes a greater absorption of work within the fan, and the speed of the fan is reduced, assuming the power applied to the fan shaft remains unchanged.

Coal and Coke News

Washington, D. C.

The opening of Congress has brought with it the usual crop of bills relating to mining of all kinds. Those introduced in the House of Representatives and some of those in the Senate are now available in printed form and include some familiar proposals renewed from past sessions as well as several new ones. Among those now receiving attention are Nos. S. 51, 725, 1772 and H. R. 4669 and 294, providing for the establishment of mining experiment stations at various places, all of which have been referred to the Committees on Mines and Mining. Four bills, H. R. 18, 6043, 5802 and S. 52, call for the creation of a commission to codify and suggest amendments to the general mining laws. Two measures, S. 775 and H. R. 174, relate to mining for radium and its regulation; bills S. 50 and H. R. 671 call for the use of a portion of the proceeds of the sales of public lands to aid the endowment of schools or departments of mines.

Senate bill No. 776 provides for the amendment of the revised statutes so that Sections 2347 and 2348 shall read:

> Section 2347. Every person above the age of 21 years, who is a citizen of the United States, or who has declared his intention to become such, or any corporation organized under the laws of the United States, or of any state, or municipality, or municipal subdivision of any state, shall, upon application to the register of the proper land office, have the right to enter, by legal subdivisions, any quantity of vacant coal lands of the United States not otherwise appropriated or reserved by competent authority, not exceeding 1,280 acres upon payment to the receiver of not less than $10 per acre for such lands, where the same shall be situated more than 15 mi. from any completed railroad and not less than $20 per acre for such lands as shall be within 15 mi. of such road.
>
> Sec. 2348. Any person, or any corporation organized under the laws of the United States, or of any state, or municipality, or municipal subdivision of any state, as above provided, who has opened and improved, or shall hereafter open and improve, any coal mine or mines upon the public lands, and shall be in actual possession of the same, shall be entitled to a preference right of entry under the preceding section, of the mines so opened and improved.

H. R. Bill No. 531 provides for a change in modes of government purchase of coal and reads in part as follows:

> That all wood, coal, oil, gas or other fuel to be purchased and used by any executive department or independent establishment at the seat of government or elsewhere, except necessary emergency purchases in open market, shall be selected, purchased or contracted for in accordance with the recommendations of and under the specifications prepared by the Bureau of Mines.
>
> Section 2. That it shall be the duty of said bureau from time to time to investigate the fuel-burning equipment used by any such department or independent establishment, the methods of purchase and manner of handling, storing and using fuel, and to recommend to such department or independent establishment such changes as will result in the greatest economy to the Government, and to submit a report to Congress, through the Secretary of the Interior, at the beginning of each regular session, setting forth all such recommendations and the results of its operations hereunder.
>
> Sec. 3. That each said department and independent establishment shall, upon request, furnish reports to the Bureau of Mines, in manner and form to be prescribed, relating to fuel consumption, character of fuel-burning equipment, and such other information as may be deemed necessary for the proper and economical selection and use of fuel.

There is as yet no indication of the prospects of these and several other measures, regular and continuous work not having as yet been undertaken by Congress.

HARRISBURG, PENN.

The Reading company and its subsidiaries, comprising the so-called "anthracite coal trust," obtained an appeal on Dec. 18, from Judges Buffington, McPherson and Hunt, in the United States District Court, to the Supreme Court from its decision that certain of the defendants to the action were violating the law.

While the ruling of the court was a victory for the alleged illegal combination, the court found that the business ramifications of the Philadelphia & Reading Coal and Iron Co., the Lehigh & Wilkes-Barre Coal Co. and the Central R.R. of New Jersey were not in accordance with the letter of the law, and ordered the Central company to dispose of its stock in the other concerns. The Government took a general appeal from the entire decision in the anti-trust suit, and the defendants now want the Supreme Court to set aside the finding in so far as it relates to the above concerns.

Insurance Rates Will Probably Be Completed

The State Insurance Fund Board, which has invited representatives of every coal company operating in Pennsylvania to meet its members at the Capitol will probably complete its rates for insurance or coal miners in the state fund within the next week. The officials of the fund have been securing data on accidents in coal mines in this and other states and a number of special investigations have been made with a view of meeting certain phases encountered in some of the larger mines.

The State Compensation authorities have had meetings with representatives of the railroads and the big steel and manufacturing concerns of the state and efforts will be made to secure the hearty coöperation of the coal operators. The State Insurance Fund officials will make efforts to induce some of the coal operators to insure in the state fund instead of carrying their own insurance as the railroads and big steel companies intend to do.

The meeting with the coal operators will bring together men whose operations mean over $100,000,000 in wages and a big effort will be made to win them to the state fund. James W. Leech, chairman of the Compensation Board, and Albert L. Allen, assistant manager of the state fund, will be the speakers, while the counsel for the board will be present.

The rates for insurance in the state fund, which may be made 10 per cent. lower than those of any other insuring agency, are to be issued generally as fast as they can be printed and bound.

The board has formally exempted a number of coal companies from necessity of taking out insurance to cover claims under the provisions of the Compensation Act. All these companies convinced the board of their financial ability to meet any liabilities which might be incurred under the law, the board retaining the privilege of revoking its action at any time.

The coal corporations granted self-insurance are:

United States Steel Corporation (H. C. Frick Coke Co.); W. J. Rainey; Connellsville Coke; Morris Run Coal Mining Co.; Manor Gas Coal Co.; Penn Gas Coal Co.; Westmoreland Coal Co., and the Lehigh & Wilkes-Barre Coal Co.

PENNSYLVANIA

Anthracite

Pittston—The Pittston Mining Institute is this term carrying out a remarkable course of practical demonstrations of the correct and incorrect methods of mining. A series of demonstrations of methods of setting props has been completed and on Monday night the first demonstration of the use of explosives was given. Mine Inspector Samuel J. Jennings, Eighth anthracite district, is conducting the demonstrations and giving the lectures.

In pursuance of its policy to make frequent transfers of officials to acquaint them with conditions existent in different mines, the Pennsylvania Coal Co. is preparing to transfer a number of its mine foremen soon. The list has not yet been completed, Superintendent Jennings stated. Four transfers of colliery superintendents, made Dec. 15, are as follows: John Brown, from No. 14 to No. 6; Benjamin Milton, from No. 6 to Erie; Edgar C. Weichel, from Underwood to No. 14; William Jeffries, from Hoyt colliery to Underwood.

Pottsville—Judge Brum, on Dec. 15, started hearing testimony in the suit of the Home Brewing Co., of Shenandoah, to prevent further undermining of its property by the Thomas Colliery Co. Archbishop Prendergast is also a complainant because the $80,000 church of St. Casimer is threatened. Testimony showed that the Philadelphia & Reading Coal and Iron Co. has also undermined that section.

During a single day recently the Philadelphia & Reading Coal and Iron Co. loaded 1,700 cars of coal, and this number would have been even greater if several collieries had not been shut down for the lack of cars.

Drifton—Erection of a new mine hospital for the Eckley Colliery of the Coxe Brothers & Co., Inc., is now near completion. This mine station for the care of the injured will be fitted up with the latest appliance along this line. The addition to the equipment of the colliery is an excellent one

Lattimer—The fire that broke out in the No. 9 slope of Pardee Bros. & Co. on the night of Dec. 13, has proven more extensive than at first thought, and, on Dec. 18, the Hazleton Fire Department gave the use of firemen's helmets for the men fighting the flames, which are hard to approach. A mine-rescue car is at the colliery and a doctor is on almost constant emergency duty. Twenty-three men were partially overcome on Dec. 17 with gas fumes.

Wilkes-Barre—F. M. Chase, general manager of the Lehigh Valley Coal Co., on Dec. 18, announced plans for the biggest employees' welfare movement ever attempted in the history of anthracite-coal mining. The scope and measure in Mr. Chase's creation are revolutionary in extent and character. It provides for free medical attendance and visits and instructions by professional nurses for 20,000 employees and their families to a total of approximately 100,000 men, women and children. The welfare plan will go into effect on Jan. 1. Its estimated cost is $50,000.

State College—The instruction car of the Bureau of Mines has been here for the past week training the students in the mining-engineering department in rescue work. As a result 19 men have been awarded certificates qualifying them as proficient in mine-rescue and first-aid work. One of the tests to which the men were required to submit themselves was to remain with respirators on in a tunnel filled with poisonous sulphur dioxide gas for over 10 hr.

Shamokin—Finding something wrong with his safety lamp recently, a miner in a colliery of the Susquehanna Coal Co. at this place took it apart and as a consequence the naked flame set fire to a pocket of gas, severely injuring several men.

Shenandoah—All the mines in this region are experiencing difficulty in reaching their maximum capacity in the outturn of tonnage, due to the lack of cars. Recently seven collieries suspended operations for one day from this cause.

Bituminous

Hastings—The Oak Ridge Coal and Coke Co., which lately purchased 1,200 acres of the B, or Miller, vein of coal around its plant here, has already started the sinking of an additional shaft. The coal trade in the northern part of Cambria County has reached such a stage that it is absolutely necessary to open new operations to meet the demand.

Charleroi—One of the largest coal-land deals consummated in western Pennsylvania in many years was recently closed, when the Youghiogheny & Ohio Coal Co. purchased from the Carnegie Coal Co. what is known as the Charleroi plant of the Carnegie company. The purchase price was $1,400,000. The property is situated along the Monongahela River, and consists of 1,100 acres. The Youghiogheny company is one of the largest coal companies in the Pittsburgh district, with extensive holdings in Washington, Green and Westmoreland counties. It also operates in Ohio.

Pittsburgh—Rains in the upper valleys and melting snow has begun to swell the Ohio to a shipping stage, and coal shippers are preparing to take advantage of the expected rise. Coal will be shipped to Louisville and New Orleans to an anticipated total of more than a million bushels provided that the coal shipping stage materializes.

New Carrolltown—The Watkins Coal Co. has completed the installation of a new coal conveyor at its operation between Bakerton and Spangler. This conveyor obviates the dumping of coal by hand and will increase the output of the mine from 100 to 200 tons.

Jeanette—The first train, four cars of coal, from the Delmont Gas Coal Co., was recently hauled over the Delmont spur of the Turtle Creek branch of the Pennsylvania R.R. This new branch of the Turtle Creek road runs within ½ mi. of Delmont into territory operated by the Delmont company and the New York and Cleveland Coal Co.

Uniontown—Dr. S. B. Hess and S. A. Carson were recently appointed receivers for the Harris-Smith Coal and Coke Co. The receivership was granted on the petition of the Browning Coke Co. and Lloyd H. Smith to cover an indebtedness of $30,000, representing a mortgage of the corporation in Franklin Township of Fayette County. The unsecured debtedness is $44,500 and the assets are $3,988.

Connellsville—The production of coke for the Connellsville region recently amounted to somewhat over 450,000 tons per week, being a gain of almost 15,000 tons over the preceding week. Shipments for the week were about 700 tons less than the production.

WEST VIRGINIA

Huntington—Officers of the Raleigh Coal and Coke Co. recently dedicated a handsome new theater building to their employees at Raleigh. This theater was recently completed at a cost of $20,000 and will be used entirely for the benefit and amusement of the company's employees.

Fairmont—Work was recently begun by John M. Kisner & Bro. on the construction of an engine and boiler house and supply house for the Consolidation Coal Co. at its Ida May mine in the Helen's Run field. This engine and boiler house will be 40x90 ft. in dimensions and will be strictly fireproof, while the supply house will be of wood 14x40 ft. with a large loading platform on each side.

Clarksburg—Coal operators who met recently with A. W. Thompson, vice-president of the Baltimore & Ohio R.R., received little encouragement from that official in regard to the car supply. He stated that the company is manufacturing about 100 new cars per day, but this so far has served but little to relieve the shortage.

Charleston—By providing compensation in the cases of families of two of the victims of the Boomer mine disaster within 17 days after the occurrence of the fatalities, the Workmen's Compensation Department recently established a record. The families of the other 21 victims of the explosion will be cared for as rapidly as possible.

Cautionary notices accompanied by a list of the employees killed in the mines of the state during the month of November and the immediate and contributing causes, are included in data being mailed out by Chief Henry of the Department of Mines to every section of the state. Mr. Henry's circular letter calls attention to the accidents during the month of November, when 23 men lost their lives through falls of slate or coal. These, Mr. Henry believes, could have been reduced in number by the exercise of more care by the men and the mine bosses.

KENTUCKY

Lexington—Twenty-nine foremen were given certificates, 19 first-class, 8 second-class and 2 third-class, as a result of the examination recently conducted here at the School of Mines and Metallurgy.

Louisville—The finished draft of the proposed Workmen's Compensation law was considered by the executive committee of the Kentucky Mine Owners' Association at a recent meeting in Louisville, at which it was proposed to call a meeting of the association for the first week in January for further consideration of this and other matters. Members of the Executive Committee generally approve the law which was in part a work of Kenneth U. Meguire, president of the Harlan Coal Co., and C. W. Taylor, of Greenville, who represented the coal interests on the commission. Eight members of the executive committee were in attendance.

OHIO

Columbus—In his campaign to prevent many of the mining accidents in Ohio, J. M. Roan, Chief Deputy and Safety Commissioner of Mines, has issued a pamphlet printed in all languages spoken by Ohio miners, containing excerpts of the mining laws of the state. Stress is being placed on the enforcement of discipline in and about the mines by the mine management. It is the opinion of Mr. Roan that practically every fatal accident could be prevented by the proper obedience to the mine laws.

ILLINOIS

Duquoin—Work is expected to begin in the early spring on the electric line that is to belt the coal districts of Franklin and Williamson counties, in southern Illinois. The proposed line will connect Marion, Johnston City and Herrin in Williamson County with Benton in Franklin County and Harrisburg in Saline County. The enterprise is controlled by the Schott interests of New York, who now have a line in operation between Eldorado and Harrisburg.

Edwardsville—One of the largest personal injury verdicts recorded in years was recently returned by a jury in the Circuit Court here against the Madison Coal Corporation of St. Louis. The judgment is for $15,000, in favor of John Wendzenski, of Glen Carbon, for the loss of his eyes by a premature explosion in the company's No. 2 mine, at Glen Carbon, in October, 1913. Attorneys for the company filed a motion for a new trial.

IOWA

Des Moines—There is a prospect of a new coal field being opened in 1916 in Hardin County. Coal beds of good thickness have been located and a company with ample capital is investigating the field.

Prospectors are at work on the Henry Carlock farm in Indian Creek Township in the hope of locating a vein of coal thick enough to warrant mining. Former prospects showed a good coal bed in that section, but it is not certain the roof is thick enough to withstand propping.

Mine No. 10 of the Phillips Coal Co., in Dallas County which was closed on order of the state mine examiner, is still idle. The company had tunneled under the river to tap a coal field on the other side. The examiner demanded that the operations cease until a new escape shaft was provided on the other side of the stream. The company has not yet complied.

COLORADO

Denver—The state coal-mine inspector reports that not a single fatal accident occurred during November in a Colorado coal mine, this being the first instance of the kind in 17 years. It is attributed to the enforcement of stringent "safety-first" rules and the employers' liability law.

WASHINGTON

Zillah—Two bodies of anthracite coal were discovered recently on the farm of W. M. Ludvig while he was drilling for a well. The first coal bed is 8 ft. thick, under which was found 7 ft. of blue slate clay which separated the two beds of coal. The second measure is 4½ ft. thick. The Northern Pacific R.R. Co. is making an analysis.

Seattle—As a result of the recent accident at the Ravensdale mine, owned by the Northwestern Improvement Co., a subsidiary of the Northern Pacific Ry. Co., in which 31 men were killed by an explosion of coal gas, officials of the company have announced that the ill-fated property will be abandoned. The announcement was made after it had been determined that the mine timbering and machinery had been so wrecked by the explosion and the mine made so generally unsafe that it would cost more to repair the damage than it would to open a new mine. The company has other coal lands in the same section and will start development work at once.

PERSONALS

John S. Healy, former general manager of the Davis Coal and Coke Co., has accepted a position with the Chesapeake & Ohio R.R. Co.

R. P. Curry, who has been a traveling salesman in eastern Kentucky for 26 years, has taken the management of the commissary of the Hazard Coal Co., at Hazard, Ky.

George M. Crokey, of Toledo, Ohio, has been appointed receiver of the Indian Guayan Coal Co., which operates mines in Gallia County, Ohio. The property was ordered sold on Dec. 22.

Oliver H. Hughes, a member of the Ohio Public Utilities Commission, retired recently because of the expiration of his term. Several prominent men are mentioned for the position.

E. A. Purkey, superintendent of the Antler Coal Co.'s mine at Round Bottom, has resigned to take charge of a mine for the Tyrconnell company at Rosemont. He will be succeeded as superintendent at Round Bottom by Bob Pollock.

The Bureau of Mines has appointed Dr. A. F. Knoefel, of Terre Haute, Ind., in charge of the first-aid work of the Indiana bituminous-coal operators' association, as a member of an advisory committee to aid in standardizing first-aid work throughout the country.

Peter McGovern, mine foreman at Warrior Run Colliery, of the Lehigh Valley Coal Co., has resigned, following his appointment as an inspector with the Associated Companies of Workmen's Compensation Insurance. His new position will require him to travel over a large territory inspecting working conditions and safety appliances.

Thomas Madden, a fireboss in No. 9 colliery of the Pennsylvania Coal Co., for an act of heroism performed three years ago, recently received a check for $1,000 from the Carnegie Hero Fund. Mr. Madden, while a fireboss in No. 14 colliery, made his way to a number of men who were overcome by blackdamp following an explosion. He made two trips to the dangerous workings. A short time after the explosion he received a Carnegie Hero medal.

OBITUARY

Col. Michael P. Gannon, aged 72 years, recently died at Westernport, Md. Colonel Gannon was extensively interested in the mining of coal in Maryland and West Virginia, and was also connected with several banking institutions in an official capacity.

Frank Howard Bailie, for 27 years assistant manager of sales for the H. K. Porter Co., died recently after a brief illness from pneumonia. He will be greatly missed by his past employers, and many correspondents who have been his personal friends.

Abraham Overholt Tinstman, one of the oldest coke manufacturers in Pennsylvania died of pneumonia recently at his home in Turtle Creek. Mr. Tinstman was born in East Huntington Township, Westmoreland County in 1834. In 1865 he, with Joseph Rist, purchased 600 acres of coal land in the Connellsville coke region and a short time later, they, together with A. S. M. Morgan, organized the firm of Morgan & Co., erecting 111 ovens at Morgan Mills in Fayette County. In 1870 Mr. Tinstman organized the Mt. Pleasant & Broadford R.R. Co. In 1871, H. C. Frick was engaged by Mr. Tinstman's grandfather, A. Overholt, at Broadford as a bookkeeper. His business ability, however, caused Mr. Tinstman and his partner Mr. Rist to take him into their business. Mr. Tinstman and his partner later organized the Frick Coal and Coke Co., Mr. Frick holding some stock. The company purchased 200 ovens at Broadford and 100 at Mt. Pleasant. In 1873, Mr. Tinstman met with financial difficulties and in 1876 lost everything. Within a year, however, he had obtained an option on 3,500 acres of coal land in the Connellsville district and sold the land at a large profit. He then organized the Connellsville Coal and Iron Co., and in 1880 established the A. O. Tinstman Co., of Pittsburgh. In 1881, he purchased the Mt. Braddock Coke Co. and the Pennsville Coke Co. A few years later he sold all his holdings and engaged in buying and selling coal lands until recently when he retired.

INDUSTRIAL NEWS

War, W. Va.—The Elkhorn Coal and Coke Co. will shortly install an electric plant at its coal mine to cost about $8,000.

Pittsburgh, Penn.—The Concordia Safety Lamp Co., Inc., has recently moved its office to the Fulton Bldg. in Pittsburgh.

Gary, W. Va.—The United States Coal and Coke Co. recently fired up 1,700 ovens, and is now calling for 1,000 men for work on the coke yards and in the mines.

Des Moines, Iowa—Operators report to the state department they are not hampered to any extent by car shortage and have been doing a fine business this fall.

Huntington, W. Va.—It is reported here that a new coal mine will shortly be opened at Glenhayes, Wayne County. It is thought that extensive operations will be begun shortly in that neighborhood.

Fargo, N. D.—The Standard Coal Co., of Beulah, Mercer Co., was recently incorporated with a capital stock of $25,600. The incorporators are George G. Schmidt, Marguerita Schmidt and Phillip Schmidt, all of Beulah.

Hamilton, Ohio—It is stated that the Hamilton Otto Coke Co. with a plant at Cokotto is planning to erect an addition at a cost of $80,000 for the extraction of various by-products, chief among which are light oils.

Indianapolis, Ind.—The Robinson Mining Machine Co. has been organized at Indianapolis with $10,000 capital stock. It will manufacture mining machines. The directors are Lige Robinson, Oliver Williamson, E. M. Shorter.

Beckley, W. Va.—The Prince-Wick Coal Co. has been incorporated here with a capital stock of $100,000, by Prince E. Lilly, Thomas H. Wickham and others. The company has interests in this vicinity, and proposes to open up several mines this spring.

Norfolk, Va.—In October the Chesapeake & Ohio Ry carried 2,176,990 tons of coal, being an increase of 149,112 over the same month of 1914. For the four months ending with October, the road showed an increase of 649,326, or a total coal tonnage of 9,636,309.

Lansford, Penn.—It is the intention of the Lehigh Coal and Navigation Co. to introduce electricity into all its workings in the Panther Creek Valley, both for power and lighting. The equipment is now being arranged for and the power will be supplied from the extensive plant at Hauto.

Grafton, W. Va.—A new electric haulage system will be installed in the T. B. Davis mine at Flemington, recently purchased by Clarence D. Robinson, of Fairmont. This mine has had a capacity of 500 tons daily but it is expected that this will be doubled when improvements are completed.

Washington, D. C.—Ten railroads operating in Pittsburgh territory have filed tariffs with the Interstate Commerce Commission proposing increases in freight rates on bituminous coal from Pittsburgh to points in the Middle West. Increases would become effective Jan. 20, if allowed.

Bluefield, W. Va.—A total of 2,698,706 net tons of coal were carried over the Norfolk & Western R.R. during the month of November, this being a decrease of 328,350 tons as compared with the 3,027,236 tons for October of this year, and an increase of 854,949 tons as compared with November of last year.

Camden, Mo.—A charter has been issued by the secretary of state, to the Riverside Coal and Mining Co., of Camden, Ray County, Mo. The capital stock is $2,880, one-half paid. The incorporators are J. S. Finley, William Parr and B. B. King. The company has been organized to mine and market coal.

Columbus, Ohio—It is reported that less than 3,000 coal miners in Ohio are now out of work as against 20,000 a year ago. Between 43,000 and 44,000 are now working and business is rapidly improving. The few thousands of men who are now unemployed are receiving strike benefits.

Kansas City, Mo.—Recent rains at Abilene, Kan., washed out a deep ditch and uncovered a bed of coal on the farm of R. M. White, 25 mi. south of Abilene. The deposit is apparently of good quality and is several feet thick. Specimens have been sent to the state university at Lawrence for analysis.

Moundsville, W. Va.—The Fort Pitt Coal Co.'s mine, situated across the river in Ohio, will be sold to satisfy creditors on Jan. 6. The sale will be in charge of trustee W. E. Thomas, of Bridgeport. One fourth of the purchase price must be paid in cash and the balance as soon as the sale is confirmed.

Wheeling, W. Va.—Following advances in the price of coal both East and West, it was recently announced that the quotations of run of mine coal in the Fairmont-Clarksburg field have been advanced to $1.75 and $2 per ton. Owing to a shortage, the mines are running only about 85 per cent. of their capacity.

Clarksburg, W. Va.—It is stated that not only will the coal interests in the State of West Virginia fight against any increase in the rates on coal to the West, the tariffs of which were recently filed, but that the State Service Commission and the operators would ask that the Interstate Commerce Commission investigate the rates to the East.

Petros, Tenn.—The mine and property of the Big Brushy Coal Co., which was placed in a receiver's hands a short time ago, was advertised to be sold at public sale, by Charles H. Davis, at the Company's commissary at Petros, Morgan County, Tenn., on Dec. 18, 1915, at 12 o'clock noon, subject to a $5,000 mortgage maturing in 1929.

Charleston, W. Va.—A charter was recently issued to the Pilgrim Coal Co., of Uniontown, Penn., for the purpose of operating coal mines in Ohio County, W. Va. The authorized capital of this firm is $5,000 and the incorporators are Harold Robinson, Allen B. Williams, Elizabeth M. Leonard, Donna B. Van Gilder and Abbey L. Culp, all of Uniontown.

Wheeling, W. Va.—There are many rumors afloat regarding the proposed power plant and other improvements at Beech Bottom, but it appears reasonably certain that some big expenditures are projected. It appears to be the intention to use the coal at the mine to generate power that can be transmitted to all the surrounding mines and towns.

Scranton, Penn.—Disturbances in the workings of the surface vein of the National Mine of the Lackawanna company recently caused Beech St. in South Scranton to settle more than 2 ft. Four dwellings were considerably damaged. The affected area is confined to the 700 block, and is adjacent to the other section which suffered considerably during the past few weeks.

Denver, Colo.—The Crown Tar Works of the Denver Gas and Electric Light Co. has closed a contract with the Nitro Powder Co., Kingston, N. Y., for some 25,000 gal. of naphthalene, to be delivered before Jan. 1. It is a novelty for the West to be supplying the East with this sort of material and is a direct result of the European war, which has curtailed the importations from Germany.

Martinsburg, W. Va.—William T. Coale, general manager of the Georges Creek Coal Co., as receiver for the Franklin Coal Co. of Westernport, recently sold for $11,000 the mining outfit of the latter firm, including a number of houses, mine cars, rails, tipples and other property, to the M. J. Miller's Sons of Westernport. The mines will be operated by John J. Miller and J. O. J. Greene.

Philadelphia, Penn.—Vessel freights to coastwise points, especially New England, have almost reached a record point. This has resulted in increasing the demand for coal all-rail from this territory. Recently a rate as high as $3 per ton from Virginia to Maine was paid, which is the highest known for over fifty years. During the anthracite strikes of 13 years ago the rate reached $2.50 per ton.

St. Marys, Ohio—A 3,000-ton coal heap on fire from spontaneous combustion for the past six weeks was cleaned up a few days ago at the generating plant of the Western Ohio Electric Co. A new fire from the same cause has now broken out in a 5,000-ton heap at the same place. The coal in the smaller fire was found mostly "coked," and not much damaged otherwise after the fire.

St. Louis, Mo.—T. T. Stevenson has closed a conditional deal with a New York syndicate for the sale of 22,000 acres of coal land in Meridian, Brookside, Clement and East Fork Townships, Clinton County, Ill., and papers were recently signed. If tests develop satisfactory beds of coal, the owners will receive $15 per acre, or $330,000. The logs of wells drilled for oil in that territory show good beds, and it is claimed that several mines will be sunk.

Clarksburg, W. Va.—Owing to a sudden and unexpected shortage in the natural-gas supply, which caused the West Virginia Public Service Commission to order the Clarksburg Light and Heat Co. to take steps to relieve the situation for the benefit of domestic consumers, the supply of gas has been withdrawn from nearly 100 industrial concerns using it for fuel. This has caused the temporary shut-down, in whole or in part, of many of these concerns, which have heretofore been able to use gas without limit.

Toledo, Ohio—The Toledo Coal Sales Co., has been incorporated for $10,000 and will continue business at 724 Spitzer building as it has been doing for some time past. There will be no change in the management. The general manager of the concern is D. B. Frisbee and the company handles the output of the "Southern Gem" mine in Kentucky and the "Tug Mountain" mine in West Virginia white ash territory. The incorporation was made to make possible the expansion of the business which has been rapidly growing.

Fairmont, W. Va.—A coal famine, due to a shortage of cars, is anticipated. The Philadelphia & Reading R.R. Co. has called in all its cars from the lines of the Baltimore & Ohio and Western Maryland for the purpose of loading them with anthracite coal and stocking for the future. It is said that car shortages have occurred from time to time but there has never been such a shortage as at present and the reason is traceable to prosperity. Every coal operator is clamoring for cars to fill his orders but he is getting only a few.

Central City, Ky.—Extension of the Kentucky Midland R.R. from its terminus in Muhlenberg County to Dawson Springs via Earlington, is reported to be projected. The road was built three years ago from Central City to Summers, a distance of 12 mi. and now handles the output of the big mines at Summers, via Central City. The distance to Dawson Springs, as the road is projected, is 22 mi. and the line would touch rich coal fields between Earlington and Dawson, now undeveloped. The original construction was standard in all respects.

St. Louis, Mo.—The Misosuri Bureau of Labor Statistics reports the states' production of bituminous coal for the year 1914, as 3,935,980 net tons, with a value of $6,802,325, a decrease of 382,165 or 0.85 per cent. under 1913. Macon County led with 765,703 net tons. For the state as a whole, the coal had an average value of $1.73 per net ton. Nine thousand five hundred and forty-nine miners were employed an average of 179 days. Fatal accidents numbered 19. At the present rate of consumption it is figured Missouri coal deposits are ample enough to last 9,000 years.

St. Louis, Mo.—Officials of railroads operating eastward from Chicago and St. Louis report a volume of freight moving toward the Atlantic seaboard, which is taxing their facilities to the limit. This situation has prevailed for the last two or three weeks, and has resulted in embargoes being placed at many of the terminal points and results in an abnormal situation with regard to the movement of east-bound freight. Officials of Southern lines report tonnage as holding steady at the advances established a fortnight ago. Business throughout the South is steadily improving.

Seattle, Wash.—The Port of Seattle is now considering the erection of a colliery for the benefit of boats on the Sound. After waiting five months for the Port Commission to offer terms for a lease of part of their holdings at Smiths Cove, the United Coal Sales Company has leased a site in West Seattle and will at once erect bunkers, and other facilities. The company asked the commission for a lease in July and renewed its efforts in November. It will prepare to take care of vessels which now have to load from barges alongside or go to British Columbia or Tacoma to coal.

Coal Trade Reviews

General Review

Anthracite supplies short with no indications of any relief in sight. Runaway market on bituminous. Further tightening of railroad congestion will create panic conditions. Some consumers hard pressed to keep their plants going. Middle Western roads stocking heavily but the market is not so tight.

Anthracite—Supplies of hard coal at distributing centers are reduced to a point where daily arrivals are going into immediate consumption, and energetic measures are occasionally necessary to keep consumers from running short. All attention at the moment is concentrated on getting tonnage forward with the utmost dispatch. The railroad congestion is more acute, if anything, and the inadequate car supply has seriously interrupted operations in the mining regions, still further restricting the available tonnage. Buyers are aggressively seeking odd tonnages to fill out their requirements, and it is developing that substantial premiums above contract quotations are occasionally being paid on the steam grades. Some of the railroads have already begun to confiscate coal en route.

Bituminous—The spectacular advance of the past week has caught producing interests, distributors and consumers alike unprepared and the market is beyond control. Speculation is rife, brokers turning over tonnage daily at unprecedented profits, and this condition will persist until the carriers solve the transportation riddle. The abundant supplies at Hampton Roads is the only factor restraining the speculative element from forcing prices up to a panic level.

In spite of the fact that all available vessel tonnage has been pressed into service, arrivals are still inadequate so that shippers are holding customers down to the very smallest tonnage they can keep going on and it is probable that some curtailment may result unless the transportation companies succeed in getting coal forward more promptly. It is practically a runaway market, exaggerated predictions concerning prices made a month or six weeks ago having been more than realized. Quotations are fluctuating in a spectacular manner over a wide range.

Exports—The sharp flurry and anxiety regarding supplies in the domestic market have dispelled all interest in the offshore business. While vessel rates have apparently not increased any further, tonnage is more difficult to obtain, and practically everything in the Coastwise market has been covered. Dumpings over the Hampton Roads pier show some improvement, though they are still substantially below the previous high level.

Ohio Valley—Demand on contracts continue very heavy, with the result that there is little free coal to be picked up in the prompt market. The inquiries which developed from the Seaboard last week have apparently not materialized into actual business, though the regular line demand is stronger and prices stiffer. The warmer weather caused a temporary reaction, but none of serious proportions, dealers seizing upon the opportunity to accumulate as large stocks as possible. The steam demand continues particularly strong; there have been plentiful supplies of this grade so far, but it is reported that some consumers have been encountering difficulty in getting sufficient tonnage to keep going. The heavy rains have interfered with transportation in some quarters.

Middle West—The lowest temperatures of the season, supplemented by the constantly expanding demand from industrial quarters and extra orders from the railroads for stocking purposes, has increased the working schedules and strengthened the market still further. Anything on the order of concessions from list prices has been eliminated and the market is firm all along the line. Transportation is fairly good; no serious difficulties have yet been experienced in this direction but it is felt that the general congestion prevailing throughout the East may spread to this section. Weather conditions in the Northwest have not been so favorable to an active consumption, and the movement out from the upper ports has been relatively light.

A Year Ago—Anthracite consumers becoming urgent about prompt deliveries. Bituminous quiet with sellers concerned mostly about new contracts. Effects of the customary year end curtailment already being felt but colder weather stimulates the domestic trade.

BUSINESS OPINIONS

Iron Age—The embargo laid by all railroads on shipments of iron and steel products to New York for export, while it throws some serious problems on the mills, is a blessing to domestic consumers. While exports of steel have been declining since August, largely because of transportation difficulties, they have amounted to enough to bring measurable relief if diverted into home channels. There is more pressure from consumers to get places on the steel companies' order books for deliveries after July 1, 1916, and the amount of such business taken is increasing, though some mills still insist they are not ready to sell for the second half. The calculations of important manufacturers who work up iron and steel are more and more based on the projection of record consumption and high prices far into next year.

Philadelphia News Bureau—With the closing of the year the conditions are very promising. There is naturally much depression over the European outlook, but so far as the domestic situation is concerned there is every reason for confidence. A very encouraging feature is the remarkable Christmas trade, which is not confined to any one section, but is general over the whole country. People have made big money and they are spending it. When the year-end statistics are published much surprise will be expressed at the position of the United States. It is idle to say that we have discounted all the goods that are coming to us.

Dun—Temporary restriction of operations resulted from the storm, which for a time hampered wire and transportation service and aggravated the congestion of freight. Needed deliveries were further retarded and the strength of certain commodities accentuated, while outdoor work in the East and Great Lakes region was partially suspended. Considerable benefit, however, accrued from the snowfall and lower temperatures, additional stimulus being imparted to the distribution of heavyweight apparel, footwear and fuel. Commercial failures this week, are 381, against 372 last week, 361 the preceding week and 449 the corresponding week last year.

Bradstreet—Sustained activity in a majority of lines, with prospects of still greater growth, typify current trade and industrial conditions. Contrary to precedent, the larger trades do not display the customary pre-holiday characteristics that usually prevail when the time for the taking of inventories arrives. True, there has been a lull in some sections, but by and large activity is so steadily maintained that salesmen are remaining on the road longer than usual at this season, and most reports agree that wholesale, as well as jobbing trade is of large volume.

Winter Wheat Condition—The government report on winter-wheat condition, shows a total area sown this fall of 37,256,000 acres, a decrease of 3,197,000, or 8%, from the area harvested this year, with a condition on Dec. 1 of 87.7, as against 88.3 last year, and a ten-year average of 90.8. The condition shown is the lowest since 1911.

Marshall Field & Co.—Current wholesale distribution of dry goods is far in excess of the corresponding period of a year ago. Seasonable weather, together with the record breaking holiday business that retailers all over the country are doing, is largely responsible for this increase. Road sales for both immediate and spring delivery continue to be larger than the corresponding period for the past few years, and the customers have been in the market in greater numbers. Collections are satisfactory and prices firm.

The Southern Lumberman, though winter weather has now come in earnest, the resulting contraction of building operations has so far in no respect weakened the strong yellow-pine market. The actual volume of business moving is somewhat less this week, and has, in fact, shown gradual decrease for the past three weeks, but production at the mills has been kept at its proper level and the market has continued to rise accordingly. Even more uniformly optimistic reports are being received than have characterized the hardwood market during recent weeks.

ATLANTIC SEABOARD

BOSTON

Hampton Roads accumulations likely to be reduced by car and labor shortage. Situation grows more acute from day to day. Georges Creek shipments light and Pennsylvania grades active at new high levels. Water freights nominal with no tonnage to be had. Anthracite shippers getting farther behind.

Bituminous—The situation in New England gets increasingly grave. Hampton Roads is still the one place where there is a surplus of coal and prices have not changed but it is very likely that the holiday period there will show a marked change. Already a scarcity of cars is noted on certain of the Virginia railroads, particularly those with western connections, and if loaded cars are not released at the piers it will mean a reduced output. The Christmas season is another factor that will tend to reduce accumulations at Hampton Roads. Should steamers and barges be obliged to wait for coal it will mean such a falling-off in the only dependable source of supply for this territory that the market will be in very serious straights.

It is reported $7 has been paid for Pocahontas and New River on cars Providence, and apparently there is nothing to prevent a spectacular advance. Shippers are holding their customers down to actual week to week consumption in many cases and most strenuous efforts are being made to keep plants running.

Georges Creek has shortened up materially in supply at all the loading ports, and deliveries at this end are much hampered by slow movement along the coast. Car supply at the mines is rapidly getting worse and shipments to this territory are likely to be few and far between by Jan. 1. That some of the transportation ordinarily carrying Georges Creek has been loading at Hampton Roads this week is a significant development.

The Pennsylvania grades continue active, although the buying of spot lots is rather spasmodic. Cambrias and Somersets meet with ready sale at prices up to $3.25 f.o.b. mines, while good Clearfields are only 25c. less. The higher volatile coals from Clarion, Indiana, and Armstrong counties have already entered the market, although the freight differential against some of them causes a much lower price at the mines. For this grade as high as $2.50, however, has been paid during the week. There is a good deal of tempering of the market and everybody has coal for sale but actual sales so far are not very heavy.

Water Freights—The only reason that rates are not in excess of $3, Hampton Roads to Boston, is that there are practically no bottoms open to charter that can load under 30 days. Several charters have been made for a series of trips at current rates and the prospect is by no means clear. The situation on small boats for New York loading to points like Providence has not eased up in the least; $1.25 has been paid for trips through March and April.

Anthracite—Shipments are extremely slow, and certainly a bad situation is facing Tidewater New England. An embargo against deliveries all-rail to points on the New Haven R.R. only emphasizes the congestion that prevails on most of the lines. Many of the collieries are on half-time. Certain kinds and sizes of hard coal are also in scant supply and most of the dealers are alarmed over the outlook. Dec. 15 the Boston retailers advanced stove and egg coal to $8 and chestnut to $8,25 per net ton delivered.

Bituminous quotations, f.o.b. loading port at points designated, are about as follows per gross ton:

	Philadelphia	New York	Baltimore	F.o.b. Mine
Clearfields	$3.50@4.25	$3.80@4.55	....	$2.25@3.00
Cambrias and Somersets	3.75@4.50	4.05@4.80	....	2.50@3.25
Georges Creek	....	....	....	....

Pocahontas and New River are still quoted $2.80@2.85 f.o.b. Norfolk and Newport News. On cars at Boston prices are $6.50@6.75, and $6.75@7 at Providence.

NEW YORK

Car shortage affecting anthracite market. Some labor troubles on docks. Steam sizes stiffen. Bituminous prices advance. Some manufacturers may run short.

Anthracite—Lack of supply, due to the freight congestion and an increased consumption have caused a tightening of the hard coal situation at Tidewater. In addition to car troubles some shippers are having labor disturbances among the stevedores and coal handlers but this difficulty promises to be settled shortly.

Shippers have had to exert their best efforts to meet orders. The strong situation is reflected in the opening of bids early this week for supplying city departments with 18,000 tons of buckwheat coal and about 250 tons of egg, there being only one bid on each contract; under ordinary conditions there would have been at least a dozen bidders on each item. Boats continue scarce and freight rates remain around the 35c. mark. Prepared coals are commanding full circular and there are reports of premiums for stove and nut sizes. Line demand for the larger sizes is active. High grade steam coals are practically out of the running. Pea coal is quoted at $3.50 and better. Fair grades of buckwheat are commanding from 10 to 20c. above regular price and barley is quoted at $2.25 f.o.b.

Current quotations, gross tons, f.o.b. follow:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$5.05		$5.10	
Egg	5.30	$5.30@5.30	5.35	$5.35@5.35
Stove	5.30	5.30@5.30	5.35	5.35@5.35
Chestnut	5.55	5.55@5.55	5.60	5.55@5.60
Pea	3.50	3.45@3.50	3.55	3.50@3.55
Buckwheat	2.75	2.45@2.75	2.80	2.45@2.80
Rice	2.25	1.95@2.25	2.30	2.00@2.30
Barley	1.75	1.50@1.75	1.80	1.75@1.80

Bituminous—Failure to get shipments forward and a heavier demand have resulted in further price increases at Tidewater though line prices are a trifle softer. However, some shippers believe the situation is easier but see no hope for much improvement unless the freight congestion improves. During the week hardly any grades of coal could be obtained at less than $4 f.o.b. while most quotations were from $4.25 to $4.50 and higher according to quality. There is practically no coal at Tidewater docks owing to the failure of the transportation companies to get shipments forward. Agencies find it impossible to make any promises as to when they can fill orders. Many boats continue to be held at the docks.

Wholesale houses are unwilling to take on any more contracts, on Monday of this week there was but one bidder on a contract for 5,000 gross tons of bituminous slack for one of the city departments. Contractors are becoming anxious and there are reports that some large manufacturers have said that unless they can secure better deliveries it will be necessary to partially suspend operations at their plants. There is very little free coal to be had; quotations range from $4.25 to $4.50, and as there are plenty of buyers, there is little dickering over prices. Slack is quoted at $1.75 at the mines.

Current quotations, gross tons, f.o.b. Tidewater follow:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$4.30@4.55	$4.30@4.55	$4.30@4.35	$2.75@3.00
Georges Creek Tyson	4.05@4.30	4.05@4.30	4.05@4.30	2.50@2.75
Clearfield:				
Medium	4.05@4.15	4.05@4.15	....	2.50@2.60
Ordinary	3.90@3.95	3.90@3.95	....	2.35@2.40
Broad Top Mountain				2.25@2.50
Cambria County:				
South Forks	4.05@4.30	....	....	2.50@2.75
Nanty Glo	4.05@4.30	....	....	2.50@2.75
Barnesboro	4.05@4.20	....	....	2.50@2.65
Somerset County:				
Quemahoning	....	4.05@4.30	4.05@4.30	2.50@2.75
Medium	4.00@4.15	4.00@4.15	4.00@4.15	2.50@2.65
Latrobe	3.95@4.15	....	....	2.40@2.60
Greensburg	3.95@4.15	....	....	2.40@2.60
Westmoreland	3.75@3.85	....	......	2.00@2.10
West Virginia Fairmont ¾		3.80@3.90	3.80@3.90	2.00@2.10
Fairmont mine-run		3.80@3.90	3.80@3.90	2.00@2.10
Steam		3.80@3.95	3.80@3.95	2.25@2.40
Western Maryland		3.80@3.95	3.80@3.95	2.25@2.40

PHILADELPHIA

Anthracite is extremely brisk with chestnut, buckwheat, and rice the leaders. Car supply outlook serious, with many collieries shut down. Bituminous prices touch the $3 mark, and are advancing almost daily.

Anthracite—Sales agencies have abandoned seeking orders, and are now concentrating their efforts on following up shipments, and rushing the coal forward with the utmost dispatch. Orders are plentiful on practically all sizes, and it is impossible to satisfy the demand. With such active conditions at this time, there is a great deal of concern felt over what the situation will be later. The car supply question continues the chief cause for anxiety, the situation in this respect becoming more acute as the season advances. Production is being severely restricted from this cause, one of the leading anthracite companies having been reduced to half-time working schedule during the past week. Sizes that could not be moved, except at the severest kind of a sacrifice a month ago, are now in active demand, some of them bringing substantial premiums.

The purchasing agents for the large consumers are combing the market for coal, and it has developed that a number of large buyers are paying premiums on buckwheat and rice coal. This is particularly the case with bituminous consumers, who are attempting to supplement their requirements with anthracite coal. A gratifying feature of the situation is the fact that domestic consumers have not yet taken alarm over the situation; the demand from this source continues only on about a normal basis for this season, but even this is sufficient to absorb all the arrivals, and any heavy buying movement would precipitate a runaway market.

The demand for broken shows no abatement. The output could probably be sold at full circular, $3.50 and tax, but the contracts prevent this, as practically all this size is sold that way. Gas companies and iron foundries, which are the principal consumers are endeavoring to stock heavily. Egg is still the weakest size and the companies find it difficult to move at $3.75 and tax, while the individuals show an inclination to shade the price to the extent of 10 or 15c. by omitting the tax. Stove coal is all sold at $4.10 and tax and shippers are unable to supply the demand for this popular size. Chestnut has been the real leader this week, quite a few dealers allowed their stocks of this grade to run down to make room for pea at $2 and tax and they are now suddenly confronted with a great shortage. If the large dealers decide to draw on their storage piles for the prepared sizes, it will relieve the situation provided the inadequate car supply does not interfere.

The rumor of a new price circular at the first of the year grows in strength and it is altogether likely that there will be material changes in all sizes at that time.

The prices per gross ton at mines for line shipment and f.o.b. Port Richmond are as follows:

	Line	Tide		Line	Tide
Broken	$3.50	$4.75	Pea	$2.50	$3.25
Egg	3.75	5.00	Buckwheat	1.50	2.25
Stove	4.00	5.00	Rice	.85	1.75
Chestnut	4.15	5.25	Barley	.50	1.50

Bituminous—Six weeks ago predictions of even $2 coal before Jan. 1 were scoffed, yet that price was reached two weeks ago and we now have $3 coal. Of course this is not on all grades, but numerous sales have been reported at from $2.75 to $3 for coal that a few months ago was considered only ordinary. Price changes have been so rapid that no one cares to venture a prediction. The past week witnessed the biggest advances so far this season, ranging from 70c. down to 25c. or a general average of about 30c. The car supply continues inadequate, with most shippers claiming to receive only 20% to 30% of their requirements.

Prices per gross ton, f.o.b. cars at mines, are about as follows:

Georges Creek Big Vein	$2.75@3.00	Fairmont gas, ¾	$1.90@2.00
South Fork Miller Vein	2.70@2.75	Fairmont gas, mine-run	1.75@1.85
Clearfield (ordinary)	2.50@2.75	Fairmont gas, slack	1.60@1.75
Somerset (ordinary)	2.50@2.75	Fairmont lump, ordinary	1.70@1.80
West Va. Freeport	2.50@2.60	Fairmont mine-run	1.65@1.70
		Fairmont slack	1.60@1.75

BALTIMORE

Trade dominated by many unusual conditions. Low-grade fuels advance rapidly. Hampton Roads coals coming in all-rail.

The trade is dominated by railroad embargoes on general freight, car shortage and excessive vessel freights in such a way that the most unusual conditions have resulted. All consumers, except those suffering from a real pinch, have been practically driven out of the market for the time being. Many lower grade coals have advanced more rapidly than high-price fuels. In such a market it is difficult to quote prices.

An unusual condition was noted here the past week, coals which are usually handled exclusively at Newport News finding their way here by all-rail route for local consumption. This coal was offering at a mine basis of less than $1.50 in many cases in Virginia, and after payment of freights by way of Potomac yards was still delivered here cheaper than some of the steam fuels that are handled through this port regularly. Some effort was made to handle this coal by barge from Newport News, but as rates had jumped to $1.50 a ton compared with the regular barge rate of about 50c. or less, the effort was given up. From $3.50 to $4 is being charged for shipment of coal from this port to Boston, with other New England ports in proportion.

The market is quotable on about the following basis:

	Mines	Balt.*	Fairmont	Mines	Balt.*
Geo. Crk. Big Vein	$3.00	$4.18	Ordinary mine run	$1.75	$3.23
Geo. Crk. Tyson	3.00	4.18	Ordinary ¾	2.00	3.48
Clearfield	2.75	3.93	Ordinary slack	1.65	3.13
South Fork	2.75	3.93	Low sulphur mine-run	Out of market	
Latrobe	2.65	3.83	Low sulphur ¾	Out of market	
Somerset (best)	2.75	3.93	Low sulphur slack	Out of market	
Somerset (good)	2.55	3.73			
Quemahoning	3.00	4.18			
Freeport	2.65	3.83			
Miller Vein	2.75	3.93			

* F. o. b., outside Capes.

HAMPTON ROADS

Some slight increase in demand. Prices unchanged. Government takings fair.

The coastwise and foreign movement has been better the last few days and a fairly large fleet has been loaded. The accumulation at Tidewater has been reduced somewhat although there is still more than the normal supply of coal on hand at this time. Foreign cargoes have nearly all been New River and Pocahontas run-of-mine although some gas coals have been exported. Prices remain unchanged.

The collier "Cyclops" took a large cargo for the government and the Panama R.R. collier "Achilles" took the largest cargo exported during the week. The number of vessels calling here for bunkers was only fair although there was perhaps a slight increase over the previous week's business.

Railroad Tonnages—Dumpings over the local piers for the past five weeks compare as follows:

Railroad	Week Ending Nov. 20	Nov. 27	Dec. 4	Dec. 11	Dec. 18
Norfolk & Western	100,598	118,065	116,450	87,726	104,942
Chesapeake & Ohio	67,209	93,924	81 875	70,535	55,503
Virginian	39,485	54,591	41,386	52,247	61,728
Totals	207,292	266,580	239,711	210,508	222,173

Ocean Charters, Clearances and Freights

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	To	Tons	Rate
Yuma	Mayport	1,400	
I. B. Wiley	Rio Grand	611	$9.00
Isthmian	Rio de Jaeniro	3,463	

BALTIMORE

Vessel	To	Tons	Rate
Claveresk	Cuba	2,441	
Absalom	Egypt	1,352	

BALTIMORE—Continued

Vessel	To	Tons	Rate
Snowden	Buenos Aires	1,035	

VIRGINIA

Vessel	To	Tons	Rate
Platea	River Plate		
Edith	Porto Rico	1,051	$3.75[1]

[1] And port charges.

VESSEL CLEARANCES

The following steamers have cleared from various ports during the week ended Dec. 17:

NORFOLK

Vessel	Destination	Tons
Achilles[1]	Canal Zone	12,021
Thorsa[2]	Kingston	1,450
Vitalia[3]	St. Thomas	1,500
Sousa[4]	Kingston	1,130
Carmine[2]	Genoa	2,074
Patras[5]	Genoa	4,147
Moldegaard[4]	Puertd	3,954
Tabor[2]	Curacao	5,200
R. W. Clark[6]	St. Georges	668
Assunta[6]	Genoa	1,926

NEWPORT NEWS

Vessel	Destination	Tons
Mt. Vernon[7]	Santiago	950

NEWPORT NEWS—Continued

Vessel	Destination	Tons
Sinaloa[7]	Cienfuegos	2,400
Inverkip[8]	Rio de Janeiro	5,300
Francis[9]	Brazilian	2,415

PHILADELPHIA

Vessel	Destination	Tons
Thelma	Cuba	846
Cressey	Gumacoa	1,500
Merrill	Rio Janeiro	
Yuna	Mayport	
Davenport	San Juan	1,813
S. Palmer	Rio Janeiro	3,900
Bast[1]	Scituate	

[1] W. C. Atwater Co. [2] Castner, Curran and Bullitt. [3] Hasler Bros. [4] Smokeless Fuel Co. [5] New River Coal Co. [6] Pocahontas Fuel Co. [7] Berwind White. [8] C. H. Sprague & Son. [9] C. & O. Coal and Coke Co.

OCEAN FREIGHTS

Steamers are even more difficult to obtain than a week ago, although a number of boats have been chartered. Freight rates are at about the same level. We quote rates on coal by steamer as follows:

To	Rate	To	Rate
Havana	$3.00@3.25	Bermuda	$4.00@ 4.25
Cardenas or Sagua	3.50@4.00	Vera Cruz	5.50@ 6.00
Cienfuegos	3.75@4.00	Tampico	5.50@ 6.00
Port au Spain, Trinidad	4.75@5.00	Rio	12.00@12.60
St. Lucia	4 75@5.00	Santos*	12 00@13.20
St. Thomas	4.25@4.50	Montevideo	12.60@13.20
Barbados	4.75@5.00	Buenos Aires or La Plata†	12.60@13.20
Kingston	**4 25**	Rosario	12.00@13.20
Curacao	**4.50**	West Coast of Italy	22.80@24.00
Santiago	4.00@4.25	Barcelona**	21.60
Guantanamo	4.00@4.25	Valparaiso or Callao	12.00@13.00
Demerara	6.50@7.00	Marseilles	21.60@22.80

* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British steamers; neutral steamers are more difficult to obtain and the rates are always higher.

W. W. Battie & Co.'s Coal Trade Freight Report.

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge. 24c. per net register ton per day demurrage."

OHIO VALLEY

PITTSBURGH

Less bidding from Seaboard. Better prices locally for prompt, with contract unchanged. Slack strong.

Not so much is heard this week of high prices bid in the East for Pittsburgh coal but the regular line demand is better and higher prices are obtainable in the territory regularly tributary to this district. The highest prices bid by Eastern buyers a week or 10 days ago were $1.75 per gross ton, equal to $1.56 per net ton, for spot shipment with car numbers given and $2, equal to $1.78, for Pittsburgh coal already in the East. Bids now are not much over $1.50.

Car shortages are in evidence at the majority of mines but no serious curtailment has resulted as yet. With heavy demand on contracts, however, the volume of free coal available is far from large, and prompt lots of mine-run are bringing from $1.25 to $1.35. Pittsburgh No. 8 district has experienced no improvement, however, not having had the stiffening effect of a demand from the East, and quotes $1 to $1.05 for mine-run. Slack is in moderate request and is firmly held, with the prospect that any material increase in demand will send prices quickly up to almost the mine-run level.

There are hardly any negotiations on contracts. We quote prices as follows: Prompt: Slack, $1@1.05; mine-run, $1.25@1.35; ¾-in., $1.35@1.45; 1¼-in., $1.45@1.60; on contract to Apr. 1: Slack, $1@1.10; mine-run, $1.25@1.30; ¾-in., $1.35@1.40; 1¼-in., $1.45@1.50, per net ton at mine, Pittsburgh district.

BUFFALO

Bituminous market very feverish. Prices fairly unquotable. Not coal enough to go around. Buffalo far behind seaboard prices, but improving.

Bituminous—Buffalo is substantially behind the prices paid in the Eastern territory, due for the most part to the fact that the trade Westward is not so active and coal from that direction is coming here; at first it was Panhandle coal and now it is that from No. 8 in Ohio that is keeping this market down. It has developed, however, that all these coals are finding it possible to pay an extra rate to Tidewater territory and still make a profit over Buffalo prices; if this proves lasting there will soon be an end of cheap coal here. It is a long time since so many wild stories of the situation have been heard. Jobbing coal at 50c. a ton profit in large amounts is reported and some mine agents declare that they are getting a full dollar a ton more than it costs them. The market has advanced so rapidly that it has caught both sellers and consumers unprepared. Certain Eastern jobbers and consumers are still pretending that they can get coal at a moderate advance and sometimes make offers at prices much lower than salesmen are asking, but there is never any business done on this basis.

Quotations must therefore be accepted as mere efforts to size up the market in this direction, for, as one jobber puts it, the price goes up between one telephone call and the next. Quotations are:

	Pittsburgh	Allegheny Valley	Penn Smokeless
Lump	$2.90	$2.60	$2.75
Three-quarter	2.75	2.40	.....
Mine run	2.65	2.30	2.50
Slack	2.50	2.15	2.50

Quotations are f.o.b. cars at Buffalo or the Niagara bridges and per short ton except east of Rochester or Kingston, Ont.

Anthracite—The demand is only fair. The consumption does not appear likely to equal that of recent years, so that the lost ground, which seemed certain of being recovered during the winter, may not be made up.

The Lake trade closed on Dec. 12, with season's shipments amounting to 3,863,072 short tons, as against 4,285,228 tons in 1914 and 5,033,696 tons in 1913, which was the banner season.

Prices of anthracite are steady at $5.60 for grate, $5.85 for egg and stove, $6.10 for chestnut and $4.30 for pea, per long ton, f.o.b. cars at Buffalo, with 25c. additional for delivering on board vessels.

TORONTO, CAN.

Market fairly active and movement better. Some price advances.

The market for all grades of coal continues fairly active. Dealers are keeping up stocks and supplies are coming forward more freely owing to improved transportation conditions. A noticeable feature of the season's trade is the considerably increased demand for smokeless semi-bituminous coal due to the more rigid enforcement of the smoke laws. There is some scarcity of this grade at present owing to the demand of the Eastern states. It is quoted wholesale per short ton f.o.b. cars at destination at $4 for lump and $3.75 for slack; retail lump, $5.75. Anthracite was advanced this week, quotations for best grades per short ton being as follows: Retail anthracite, egg, stove and nut $8; grate, $7.75; pea, $6.75. Bituminous retail steam $5.25, screenings, $4.25 to $4.50; domestic lump, $6; cannel, $8. Wholesale f.o.b. cars at destination, three-quarter lump, $3.79, screenings $3.15.

COLUMBUS

The colder weather stimulates the domestic trade still farther. Steam trade active and demands for tonnage increasing. Prices remain firm.

The best feature of the coal trade in Ohio has been the increase in orders for domestic tonnage. The lower temperatures are having their effect and dealers are making an effort to accumulate stocks. The demand is well distributed among the various grades and varieties.

Retail trade has been more active than formerly. Dealers are rushed with many small orders, as usual when the first real cold snap appears. Retailers stocks have been sufficient for the extra demands so far but they are not large. Retail prices are ruling firm at the levels which have prevailed for the past 10 days. All recent advances have been maintained.

With the general expansion in manufacturing the demand for steam fuel is increasing constantly and some consumers have trouble in getting a sufficient tonnage. Premiums are being paid for prompt shipment. Iron and steel plants are especially active. There is a scarcity in the supply of the small sizes and prices have been farther advanced.

The recent slump in Pocahontas has been checked by the colder weather. Considerable tonnage from that district is now going Eastward. There is a considerable demand for steam sizes from the Canadian market and a large tonnage is being shipped across the border.

Anthracite is stronger all along the line and there is a scarcity of chestnut size.

Prices in Ohio fields f.o.b. mines, per short tons, are as follows:

	Hocking	Pomeroy	Eastern Ohio	Kanawha
Re-screened lump	$1.60	$1.65	.....	.....
Inch and a quarter	1.50	1.50	$1.35	$1.50
Three-quarter-inch	1.35	1.40	.....	1.35
Nut	1.25	1.30	.....	1.25
Mine-run	1.15	1.20	1.05	1.10
Nut, pea and slack	.90	.95	.80	.80
Coarse slack	.80	.85	.70	.70

CLEVELAND

Market a little weaker. Receipts fairly liberal, but industrial stocks are light. Holiday curtailment will restrict the demand. The retail trade only fair with buying comparatively light.

Pocahontas remains unchanged at the prevailing low prices of the last two weeks. Retail dealers are holding shipments down to their immediate requirements and the market is not so brisk as it was following the first cold snap of the season.

The high prices in other sections have practically restricted Cleveland buyers to No. 8 coal. Youghiogheny is selling at $1.50 at the mines. West Virginia low sulphur fuels are not selling here and the outlook is for very little coal except No. 8 for some time to come. The supply is low though the demand does not seem to show much improvement.

A few cars of No. 8 coal have been shipped to Tidewater; the price at which it was sold is reported to be $1.75 a gross ton at the mines.

Locally the market is up ten to fifteen cents a ton on No. 8.

Jobbers are paying the following prices f.o.b. Cleveland per short ton:

	Pocahontas	Youghiogheny	Bergholz	Wainwright	No. 8
Freight	$1.45	$1.00	$0.70	$0.70	$0.90
Lump	3.25	.....	.....	.....	.....
Lump, 6 in.	.....	.....	2.30	.....	.....
Lump, 1¼ in.	.....	2.60	2.10	2.30	2.15
Lump, ¾ in.	.....	2.50	2.00	2.10	2.05@2.10
Lump, 3 in.	.....	.....	.....	2.40	.....
Egg	3.25	.....	.....	.....	
Mine run	2.70	2.50	1.90	1.95	2.05@2.10
Slack	.....	2.00	1.90	1.90	1.95

TOLEDO

The colder weather has stiffened up the domestic market somewhat but prices remain practically unchanged. The steam trade is stronger and the prices on slack are firm. None of the large Toledo manufacturing concerns are overstocked and yet there is no dearth of supplies. The car congestion is not so bad as it was but is still a factor to be reckoned with. Practically all the coal on the local docks has been cleaned up and the Lake movement is almost entirely over for the season. Jobbers here are doing a fair business.

DETROIT

Buying of steam coal continues in good volume. Domestic sizes are more popular. Anthracite is sluggish except chestnut. Lake shippers seek tonnage for next season.

Bituminous—Demand for steam coal continues steady. Small sizes are in the best demand and shortest supply. Weather conditions have been more favorable and domestic business is showing a gradually increasing volume. Consignment stock is plentiful, but is causing no serious weakening of prices.

Anthracite—Buying of the larger sizes of anthracite continues in small volume, the market appearing sluggish. Chestnut size is meeting with a ready demand and is occasionally scarce. Some of the shippers have been able to sell chestnut at a premium of 25c. a ton, when they had it. The delivery is sometimes delayed.

Lake Trade—Shippers are making considerable effort to close contracts for vessel capacity to move coal next season. Some business in that line has been done and one shipper is said to have placed a considerable amount under contract not all of which will be moved next season. Vessel owners are confident the carrying rate from Lake Erie to Lake Michigan ports will be advanced at least to 35c., as ore men have bought or placed under charter a large proportion of the independent vessels, with the stipulation in several instances that boats make the upbound trip without cargo to facilitate dispatch.

CINCINNATI

Steam grades strong and prices are stiffer. Heavy rains interfere with movement.

The steam market remains strong. Some nut and slack was selling in Cincinnati during the current week at 90 and 95c., while mine-run in several small quantities brought $1 to $1.10 per ton, and this in face of reports from other Western centers to the effect that mine-run coal is selling for considerably less. Warm weather during the early part of the week brought a temporary lull to the domestic market, but lower temperatures later should bring the domestic market back to the same basis that it has held during the past two or three weeks.

Movement off the Chesapeake and Ohio R.R. may be retarded for 3 or 4 days from Logan County account of heavy slides. This report came from the mines, but has not been confirmed by the railroad.

LOUISVILLE

The market has naturally responded to the stimulus of the colder weather, together with the continued improvement in industrial conditions. It is, however, about a normal market, with prices for block of the eastern Kentucky grades ranging nearer to $2 than heretofore, although the prices at the mines, long-ton basis, are sometimes down to the November level. Nut and slack is stronger and the demand still good, with the supply short.

COKE

CONNELLSVILLE

Prompt furnace coke fluctuating daily. Foundry coke strong. Little interest in contracts. Production increased sharply.

The market for prompt furnace coke has been fluctuating widely. On some days spot furnace coke has sold at $3.50 while the next day the highest bid would be only $3. The total demand has been very limited and the supplies have been correspondingly short. The last sales last week were at $3 and this week no market has been definitely developed, although the usual quotation is $3.50. There are two or three cases of negotiations on contracts for the first three or first six months of next year, and one or two inquiries are out for the second half, from consumers who are already covered for the first half.

Foundry coke continues very strong. At least one maker of high-grade foundry coke has a minimum quotation of $4 for spot foundry, and has been able to effect sales at this figure of single carloads. There are other brands available for less. There does not seem to be much business under negotiation for the first half of the new year. The majority of contracts made last May and June were for the twelve months beginning July 1. The market is quotable approximately as follows: Prompt furnace, $3@3.50; contract, first half, $2.35@2.50; year 1916, $2.25@2.35; prompt foundry, $3.50@4; contract, $3@3.40, per net ton at oven. The H. C. Frick Coke Co. had an option on a large block of coke for delivery over the first half at $2.50 and has allowed it to lapse.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Dec. 11 at 451,896 tons, an increase of 14,645 tons, and shipments at 451,175 tons, a decrease of 6,998 tons.

Buffalo—The market has advanced sharply due to heavy demand and the high price of coal. There are no stocks of account anywhere and the prospect of production exceeding demand is small. As there is no other source of supply here this market has to pay full prices, which rule at $5.25@5.60 for 72-hr. Connellsville foundry, $4.36@4.60 for furnace and $4.10@4.20 for stock, this latter not having advanced as much as other grades.

Chicago—Metallurgical and domestic coke are firm with demand still outstripping the supply. Gas house coke has moved up 25c. per ton. Western byproduct ovens are pushed to the limit of their capacity. Prices per net ton, f.o.b. cars Chicago, are as follows: Byproduct, foundry, $5.25@5.75; byproduct, domestic, $4.75@4.95; Connellsville, $5.25@5.75; Wise County, $5.25@5.50; gas coke, $4@4.25.

St. Louis—The general coke situation is good. A fair volume is moving for domestic use. The industrial consumption is improving with increased operations among the manufactories. Prices per net ton f.o.b. cars St. Louis, are as follows: Byproduct all sizes, $5. Gas house lump and egg, $4.25.

MIDDLE WESTERN

GENERAL REVIEW

Colder weather improves domestic trade. Great activity in steam sizes. Eastern coals fluctuating badly. Anthracite dull.

The weather is without doubt the dominating factor in the domestic markets. The week was ushered in with the lowest temperatures of the season which continued for three days and caused brisk buying by the public. Later in the week the shippers felt the rebound, and domestic orders for re-stocking were much in evidence. Maximum shipments of coarse steam coals continue at high prices, and activity in screenings is unabated. Competitive bidding in several quarters for free tonnage of fine coal has occurred, with the result that some sales have been made very near the mine-run price. Buyers seem more eager to obtain small sizes than coarse steam sizes. The drift of screenings prices is still upward.

The tone of West Virginia smokeless is sluggish, and sales are still being made at indifferent prices. Anthracite buying over the Western country is apathetic, and there is not the snap of other years to the hard-coal market. Adherence to schedule prices generally characterizes Western coals, and as delays in transportation due to snowy weather increase and labor becomes less plentiful, the few concessions that have been made to move surplus domestic sizes are becoming negligible. The car supply at Western mines has been easier, and but little delay has occurred in the movement as a result of the snowy and colder weather.

CHICAGO

Weather favors heavier consumption of domestic sizes. Steam coals still advancing smokeless stronger. Anthracite demand improved.

The Southern Illinois situation has been strengthened during the past week; lump and egg have been moving in much better volume, and screenings are strong at around 85c. Most mines have been running full time this week, and the surplus domestic sizes on track have all been cleaned up. If the present influx of orders for domestic sizes continues, the mines will soon be oversold.

Railroad storage coal is still being shipped heavily from the Springfield district, and screenings are averaging around 75c. Though sales of domestic sizes are not especially large, a marked improvement in the volume of orders from the Chicago district was noticed early in the week.

The demand for all Indiana grades and sizes now exceeds production, and some operators are complaining prices are not as high as they should be; 1¼-in. steam lump is particularly strong, and screenings range from 75c. to 85c. Domestic lump has shown increased vigor by reason of colder weather. Retailers are doing a rushing business, and jobbers are having difficulty in obtaining sufficient tonnage to meet their orders.

The market for domestic sizes of smokeless has improved a little, but it will be another ten days before it is normal. Delayed movement and colder weather had a beneficial effect on lump and egg. Most mine-run has been sold at $1.40. There is evidently too much of a disposition in the smokeless field to cut prices on the slightest pretext, which keeps the buyer uncertain. Pennsylvania smokeless coals are firm, and splint prices are well held.

Hocking prices have been well maintained, 1¼-in. lump realizing from $1.50 to $1.60; 6-in. lump $1.85 to $2, and 3-in. re-screened, $1.75 to $1.85.

Kentucky coals show less varied prices, the higher grades of block selling at about $2 per ton; egg averaging $1.60, and fine coal being strong at around 80c. to 90c.

The movement of anthracite from the mines to this district was interrupted to some extent during the early part of the week, but there was enough coal on hand to meet the spurt of orders due to colder weather. Apparently some of the outlying country dealers have not stored much anthracite, and the cold weather caught them short of stocks. Prices have held close to circular.

Quotations in the Chicago market are as follows: Per net ton f.o.b. cars mines:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump......	$1.60@1.75	$1.50@1.75	$1.60@1.70	$1.50@1.60	$1.45@1.60
Steam lump	1.30@1.40	1.30@1.35	1.30@1.40	1.25@1.35	1.35@1.45
2½ and 3-in. lump.....	....	....	1.40@1.50	1.35@1.45	1.35@1.45
1¼-in. lump.	....	....	1.25@1.35	1.15@1.25	....
Egg.......	1.60@1.75	1.60@1.65	1.15@1.20	1.10@1.20	1.15@1.30
Nut......	1.60@1.75	1.60@1.65	.95@1.10	1.00@1.15	1.00@1.10
No.1washed	1.60@1.75	....	1.50	....	....
No.2washed	1.40@1.50	....	1.40	....	....
No. 1 nut..	1.60@1.75	....	....	....	....
No. 2 nut..	1.40@1.50	....	....	....	....
Mine-run...	1.10@1.15	1.05@1.10	.85@1.00	.95@1.00	1.05@1.10
Screenings..	.85@ .90	.75@ .80	.75@ .85	.75@ .80	.80@ .95

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump......	$1.65@1.75	$1.50@2.40	$1.80@2.00	$1.95@2.00	$1.85@2.00
1¼-in. lump.	1.30@1.40	1.35@1.50	....	....	1.50@1.60
Egg.......	1.60@1.75	1.40@2.00	1.60@2.00	1.95@2.00	1.75@1.85
Nut.......	....	1.25@1.75	1.50@1.75	1.40@1.60	1.30
No. 1 nut..	1.60@1.75	....	....	....	....
No. 2 nut..	1.40@1.50	....	....	....	....
Mine-run...	1.15	1.10@1.15	1.25@1.40	1.25@1.40	1.10@1.20
Screenings..	.80@ .85	.80@ .90	....	....	.75@1.00

ST. LOUIS

Colder weather and improved steam consumption create a better tone in the market. Car supply short.

Increased activity was quite noticeable the past week. Domestic coal moved in better volume, due to slightly colder weather. With constant improvement in the general industrial situation comes a proportionate increase in the factory consumption and there has been some improvement due to the call for storage coal; some of the railroads in this section have commenced to store as well as a few of the industrials. Screenings have held steady without sign of retarding. The car supply is short, more so than it realized, but it is not as yet seriously felt, because mining operations are still somewhat restricted, except in a few instances.

Quotations f.o.b. mines during the past week have ranged on the following basis per short ton:

	Wililamson and Franklin	Staunton and Mt. Olive	Montgomery Co.	Intermediate	Standard
8 in. lump				$1.25	$1.10 @ 1.15
6 in. lump	$1.50	$1.25	$1.25	1.25	1.10 @ 1.15
3 in. lump	1.40	1.15		1.25	
2 in. lump	1.35	1.15		1.20	.90 @ 1.00
1½ in. lump	1.30		1.10	1.10	.90 @ .95
6x3 in. egg	1.40			1.25	1.00 @ 1.10
6x2 in. egg			1.10	1.10	.85 @ .90
6x1½ in. egg	1.30				
No. 1 nut	1.20			1.10	.90 @ 1.00
No. 2 nut	1.10	.75		.90	.75 @ .80
Mine run	1.10	1.00	1.05	1.05	.85 @ .90
Screenings	.75	.65	.65	.65	.60 @ .65
No. 1 washed nut	1.50	1.40		1.40	1.40
No 2 washed nut	1.35	1.25		1.25	1.25
No. 3 washed nut	1.25	1.15		1.15	1.15
No. 4 washed pea	1.25	1.00		1.00	1.00
No. 5 washed slack	.75	.65		.65	.65

DULUTH

Market quiet. Weather continues mild. Navigation closes for the year.

Mild weather for the past three weeks, has caused a rather slow movement of coal. Salesmen report business quiet due to weather conditions and in nearly every instance the country dealers and retailers have supplies to last for the time being or until the arrival of a cold snap. The railroads moved a fair tonnage during the week to interior points.

Navigation has closed and no further coal cargoes are due to arrive this year. Although no tonnage figures have as yet been made public, it is expected that the bituminous arrivals will show a decrease over those of last year, while anthracite will make a slight gain. No change in prices has as yet been announced. Quotations are as follows, per short ton, f.o.b. cars at docks, Duluth.

	Yough	Splint	Hock	Smokeless	Elkhorn
Lump...........	$3.40	$3.40	$3.40	$4.75	$3.75
Dock run........	3.10	3.10	3.10	3.25	3.25
Egg, stove and nut	3.40	3.40	3.40	4.75	3.65
Screenings.......	2.40	2.40	2.25	2.75	2.55

The movement of anthracite during the past week has been very slow, small orders of the minimum car variety prevailing and the disposition of the dealers was to purchase no more than was absolutely necessary. Prices are as follows: Nut, $7.10, egg and stove, $6.85; pea, $5.55 and buckwheat, $4, all per short ton f.o.b. cars at the Duluth docks.

INDIANAPOLIS

Moderate car shortage. Good demand all along the line. Retail prices advanced.

Indiana mines are again feeling the pinch of the short supply of cars. No complaint is heard as yet as the shortage is not seriously handicapping the operators. It is the opinion of the trade that the car congestion in the East is sure to be reflected here, sooner or later, and when the cold weather comes, car trouble may be anticipated.

There is good demand for all grades though domestic grades are easy, due to a lack of wintry weather. In the open market 80 and 85c. can be obtained for screenings, f.o.b. mine; for domestic lump $1.65 for best Nos. 4 and 6 and $1.50 for 2½ in. Retailers have advanced prices of forked Kanawha lump and Ohio Hocking lump 25c. a ton and have made the same raise on prices of Ohio Hocking washed egg, Kentucky lump and chestnut, stove, egg and grate anthracite. The new schedule of prices, in force Dec. 15 is:

Linton No. 4 lump forked.....	$3.25	Pocahontas forked lump......	$6.00
Indiana lump forked..........	3.00	Pocahontas shoveled lump....	5.50
Indiana lump and egg, screened.	2.75	Pocahontas mine run.........	4.50
Kanawha lump, forked........	4.50	Pocahontas, nut and slack....	3.75
Ohio Hocking, lump..........	4.50	Anthracite, chestnut..........	8.50
Ohio Hocking, wash egg.......	4.75	Anthracite, stove and egg.....	8.25
Kentucky lump..............	4.75	Anthracite, grate............	8.00
Ohio Jackson lump, forked....	5.25	Connellsville coke...........	6.00
Blossburg smithing...........	5.50	Indianapolis by-product coke	6.00
Cannel lump................	6.00		

PRODUCTION AND TRANSPORTATION STATISTICS

NORFOLK & WESTERN

Distribution of shipments for October and November follows:

	October			November		
	Shipped	Tipple	Total	Shipped	Tipple	Total
Pocahontas.......	1,620,736	12,436	1,633,172	1,387,567	12,137	1,399,704
Tug River........	375,743	2,788	378,531	339,154	3,474	342,628
Thacker..........	264,619	7,338	271,957	267,961	7,271	275,232
Kenova...........	95,438	10,590	106,028	92,587	10,833	103,420
Totals.........	2,356,536	33,152	2,389,688	2,087,269	33,715	2,120,984

Shipments of coke entirely from the Pocahontas field amounted to 65,836 tons in October and 74,293 in November.

GREAT BRITAIN

Exports—British exports for October and the first ten months of the past three years were as follows:

	October			Ten Months		
To	1913	1914	1915	1913	1914	1915
Russia.....	756,112	19,107	2,890	5,218,772	3,086,032	41,558
Sweden....	503,863	525,357	183,147	3,779,014	3,580,692	2,274,194
Norway....	200,079	197,813	195,514	1,888,628	2,104,903	2,292,189
Denmark...	281,369	313,873	218,143	2,494,585	2,581,185	2,741,093
Germany...	835,839	....	....	7,619,413	5,256,765	....
Netherlands	167,299	108,851	171,094	1,712,193	1,565,953	1,500,333
Belgium....	181,591	82,148	....	1,728,225	1,166,549	....
France.....	1,077,519	1,066,066	1,602,306	10,644,929	10,046,810	14,827,062
Portugal[1]...	94,748	65,434	84,069	1,124,872	988,620	871,491
Spain[4].....	328,971	200,708	167,923	3,074,153	2,659,286	1,719,553
Italy.......	910,513	705,346	559,534	8,060,538	7,262,616	4,962,532
Aus. Hung..	103,433	....	....	899,840	564,362	....
Greece.....	84,033	20,632	16,864	591,284	510,380	296,918
Roumania..	47,864	....	....	197,381	218,218	....
Turkey.....	61,728	12,069	....	246,682	429,506	10,324
Algeria.....	108,422	31,896	66,889	1,060,663	812,523	793,215
Portugal[5]..	10,908	4,166	6,114	200,990	157,452	156,536
Chile	35,310	10,382	385	492,951	370,773	39,040
Brazil......	147,943	71,596	22,274	1,593,692	1,038,214	446,556
Uruguay...	33,612	46,143	18,173	601,754	526,665	270,531
Argentine..	297,148	173,068	36,553	3,022,451	2,535,790	1,325,993
Channel Is..	14,726	12,317	8,924	136,559	139,540	109,384
Gibraltar...	25,311	15,116	26,744	280,102	254,322	296,528
Malta......	42,068	13,193	12,806	548,429	324,234	127,300
Egypt[2].....	229,100	167,770	74,353	2,488,330	2,361,658	1,154,788
Aden[3]......	20,881	16,967	1,476	148,559	135,817	112,365
India......	14,216	12,523	715	140,048	139,784	23,800
Ceylon.....	23,764	16,834	....	198,122	239,871	38,730
Miscell'ous.	101,103	95,122	53,656	1,064,102	1,002,326	512,745
Coke.......	150,955	150,879	113,499	989,010	975,204	798,188
Briquettes..	169,500	56,005	127,024	1,711,865	1,487,943	1,087,660
Total....	7,059,928	4,151,381	3,771,069	63,958,136	54,523,993	38,830,606
Bunker....	1,888,794	1,455,447	1,022,578	17,434,411	16,037,409	11,745,472

[1] Includes Azores and Madeira. [2] Including Anglo-Egyptian Sudan. [3] And dependencies. [4] And Canaries. [5] West Africa.

Note—The figures in the above table do not include Admiralty and certain other shipments.

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

+Indicates contracts regarding which official information has been received.

Recast

In the following table we give a list of all old contracts coming up for consideration during the ensuing week. The table gives our contract number, the name of the purchaser, city tonnage and page on which the detail notice appeared.

No.	Purchaser	City	State	Tonnage	Page
1603	Springfield Lake San.,	Krumroy Sta.,	Ohio,	15,000	737
1654	Chester Tube Co.,	Chester,	Penn.		911
1655	Chester Brewing Co.,	Chester,	Penn.	600	911
1656	Caledonia Mills,	Clifton Hgts.,	Penn.		911
1659	Tilden-Morris Co.,	Eddystone,	Penn.		911
1661	Scheidt Brewing Co.,	Norristown,	Penn.		911
1662	Wapakoneta Elec. & Water Wks.,	Wapakoneta,	Ohio	4,000b	911
1664	Hotel Dennis,	Atlantic City,	N. J.	4,000a	911
1678	Hahnemann Hospital	Philadelphia,	Penn.	3,000a	912
1680	G. P. Pilling & Sons,	Philadelphia,	Penn.	2,500a	912
1681	Spreckles Sugar Refining Co.,	Philadelphia,	Penn.	20,000a	912
1685	Union Cap. Life Ins. Co.	Cincinnati,	Ohio	5,000a	957
1685	Union Cap. Life Ins. Co.,	Cincinnati,	Ohio	200b	957[1]
1686	Alton Steel Hoop Co.,	Alton,	Ill.	250	957[2]
1687	Local Elec. Lt. Plant,	Millvalle,	Penn.	30,600b	957
1692	Advance Compressor Co.,	Battle, Creek,	Mich.	400b	957[3]
1693	Indus. Stor. & Warehouse Co.,	Philadelphia,	Penn.	6,000b	957[2]
1694	T. Devlin Mfg. Co.,	Philadelphia,	Penn.	4,300a	957
1694	T. Devlin Mfg. Co.,	Philadelphia,	Penn.	5,500b	957
1694	T. Devlin Mfg. Co.,	Philadelphia,	Penn.	900c	957
1698	Dept. Public Works	Milwaukee,	Wis.	2,000b	958
1704	Counties Gas & Elec. Co.,	Norristown,	Penn.	5,000	958
1705	Dourte-Hessell Mfg. C.,	Colo. Springs,	Colo.	500b	958
1712	W. Green Blower Co.,	Pottstown,	Penn.	600	998
1713	McClintic-Marshall Construction Co.,	Pottstown,	Penn.	1,200	998
1715	Water and Light Dept.,	Austin,	Tex.	60b	998[1]
1716	Reading Hardware Co.,	Reading,	Penn.	5,000	998
1718	Robesonia Iron Co.,	Robesonia,	Penn.	35,000	998
1719	Taubell, Inc.,	Riverside,	Penn.	8,000	998
1720	Gaynor Glass Works	Salem,	N. J.	4,000	998[3]
1722	Quenelda Graphite Co.,	Quenelda,	Ala.	1,560 130	998
1723	Lt. & Power Dept.,	Russellville,	Ky.	2,880b	998[3]
1724	Elec. Short Line Ry.,	Minneapolis,	Minn.	2,200	998
1725	Wolf Co.,	Chambersburg,	Penn.	2,250b	998[2]
1729	Abernathy Furniture Co.,	Kansas City,	Mo.		999[2]
1733	Peerless Cement Co.,	Union City,	Mich.	45,000	999[1]
1734	De Queen Ice & Light Co.,	De Queen	Ark.	2,000b	999
1735	Borough Lt. Plant	Tarentum,	Penn.	3,000b	999
1736	Lt. & Water Plant,	So. Whitley,	Ind.		999
1766	Link-Belt Co.,	Philadelphia,	Penn.	1,500a	1044
1767	Southwark Mfg. Co.	Camden,	N. J.	2,500a	1044
1769	Baldt Steel Co.,	New Castle,	Del.		1044
1770	Struse & Sons,	Philadelphia,	Penn.	2,000	1044
1773	Ames Shovel & Tool Co.,	Cheltenham,	Penn.	1,500a	1044
1774	Amer. Laundry Co.,	NewOrleans,	La.,	25,000	1044
1777	Western Penitentiary Penn.,	Pittsburgh,	Penn.		1044

a Indicates anthracite coal. b Indicates bituminous. c Indicates coke.

[1] Per day. [2] Per week. [3] Per month.

Notes and Awards

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

1029—Kansas City, Mo.—This contract (p. 115), which provides for furnishing the local branch of the Cudahy Packing Co. with its winter's fuel supply, involving approximately 200 tons per day, has been awarded to the **Cherokee Fuel Co.** The contract will expire in June. Address Purchasing Agent, Cudahy Packing Co., Kansas City, Mo.

1179—Kansas City, Mo.—Experiments are being conducted on this contract (p. 244), which provides for furnishing the Kansas City Terminal Ry. Co. with approximately 250 tons of coal per day, and the contract will probably be concluded early next month. Address Pur. Agt. A. J. Stewart, Kansas City Terminal Co., Union Station, Kansas City, Mo.

1515—Saratoga Springs, N. Y.—This contract (pp. 577, 660), was awarded to the **Saratoga Coal Co.,** at $6.90 for egg, and $6.37 for grate. The contract provides for 100 tons for immediate delivery, and 100 tons to be delivered later. Address Comr. Michael J. Mulqueen, Saratoga Springs, N. Y.

+1525—New Hampton, Iowa—This contract (p. 616), which provides for furnishing the County Government with approximately 200 tons of coal has been awarded to the **Merchants Coal and Coke Co.** of Chicago, at $4 per ton for Brazil block coal. There were two other bids on the business. Address Audr. P. E. McGinn, New Hampton, Iowa.

+1537—Le Mars, Iowa—This contract (p. 617), which provides for furnishing the Haynes County Court House, Jail and County Poor with coal during the ensuing year, has been awarded to the **M. A. Moore Co.** on Lincoln Springfield lump at $4.68 per ton in car lots, and $5.18 delivered. Address County Audr. J. M. Hayes, Le Mars, Iowa.

1653—East St. Louis, Ill.—Purchases on this contract (p. 911), which provides for furnishing the requirements of the Granby Smelting and Mining Co., will be confined to the open market for at least another month. Address Supt. Ross Boles, Granby Smelting and Mining Co., East St. Louis, Ill.

+1674—Erie, Penn.—Proposals on this contract (p. 912), which provides for furnishing the fuel requirements of the City Government, will not be received until January, at which time they will be acted upon by a new council. Address Supt. Frank E. Pelow, Dept. of Parks and Public Property, Erie, Penn.

1677—Chicago, Ill.—Bids have been received on the contract for furnishing the City Government with coal (pp. 912, 1043), as follows, the prices given being those computed by the city government as the actual cost in heat units according to analysis submitted per ton:

Pumping Stations: Bickett Coal and Coke Co., Chicago Ave., $2.46; 14th St., $2.43; Harrison St., $2.02; 68th St., $1.62. E. Puttkammer Coal Co., Springfield Ave., $2.05; 22d St., $2.12 and $1.72; Central Park, $1.96 (11,000 tons of mine-run also the same on 35,200 tons of nut). Ender Coal and Coke Co., Roseland, $1.60; Central Park, $1.95 on 11,000 tons of mine-run and $2 on 35,200 tons of nut. J. J. Conners, Rogers Park, $2.71; Lake View, $2.49.

Bureau of Engineering: Consumers Coal Co., $3.97 on 1,400 tons of lump "A" and $5.345 on 5,675 tons of lump "B." Pilsen Coal Co., $3.705 on 1,400 tons of lump "A" and $5.246 on 5,675 tons of lump "B"; in District No. 4, Consumers Coal Co. $5.375 on 3,500 tons of lump "B"; Pilsen Coal Co. $4.308 on 3,500 tons of lump "B."

Fire Department: Consumers Coal Co., $6.97 on 899 tons of range or chestnut; $3.50 on 883 tons of bituminous lump; $3.50 and $3.378 on 1,617 tons of lump; $7.35 and $6.85 on 916 tons of anthracite egg; $7.47 and $6.97 on 944 tons of range or chestnut; $4 and $3.50 on 2,165 tons of bituminous lump; $4 on 1,419 tons of lump. Pilsen Coal Co., $3.345 and $2.50 on 1,617 tons of bituminous lump. Bickett Coal and Coke Co., $2.52 and $2.17 on 6,640 tons of mine-run; $2.62 on 9,000 tons of bituminous nut.

Department of Police: Consumers Coal Co., $4.075 on 850 tons of mine-run; $3.956 on 1,145 tons of mine-run.

Department of Health: Consumers Coal Co., $4.076 on 925 tons of mine-run; $1.75 on 600 tons of screenings. Pilsen Coal Co., $3.85 on 3,070 tons of mine-run; $1.655 on 26,000 tons of screenings; $1.75 on 900 tons of bituminous screenings. Ender Coal Co., $4.10 on 3,070 tons of mine-run; $1.57 on 26,000 tons of screenings.

As a rule only bids on contracts involving 1,000 tons or more are given in the above, although in a few instances tonnages somewhat less are noted. Address City Engr. John Ericson, Bureau of Engineering, Department of Public Works, Chicago, Ill. (No. 312, Vol. 7, pp. 488, 666, 748, 915.)

+1746—New York, N. Y.—Only one bid has been received on this contract (p. 999), which provides for furnishing the Department of Docks and Ferries with approximately 22,000 gross tons of anthracite and bituminous coal. This bid, which was submitted by Pattison & Bowns, was: Buckwheat No 1, $4.97; bituminous slack, $4.97; buckwheat No. 3, $4.69. Address Comr. of Docks R. A. C. Smith, Pier "A," Battery Place, New York (No. 1583, Col. 8, pp. 700, 828.)

1747—New York, N. Y.—Only one bid was received on this contract (p. 1043), which provides for furnishing approximately 3,500,000 lb. of anthracite coal for the Asphalt Plant, this bid being submitted by Charles E. Norton & Co. at $1.41½ per thousand pounds for buckwheat and $2.90 for egg. Address Borough Pres. Marcus M. Marks, Municipal Bldg., New York, N. Y. (No. 605, Vol. 7, pp. 795, 918.)

1764—New York, N. Y.—No bids were received on this contract (p. 1044), which provides for furnishing approximately 700 tons of anthracite coal for various public buildings in the Borough of Richmond, S. I. It is understood that the business will be readvertised again. Address Pres. Calvin D. Van Name, Room 18, Borough Hall, New Brighton, Staten Island.

New Business

Volume and page number in parenthesis at the end of an item indicate where the previous announcement, bids and awards on that contract may be found.

1783—Atlantic City, N. J.—The Somers Brick Co. at this place usually send out inquiries for its annual coal contracts about Feb. 1, and concludes the business on Mar. 1. They require about 800 tons. The plant is located at Bakersville, N. J. Address Purchasing Agent, Somers Brick Co., Atlantic City, N. J.

1784—Bridgeport, Conn.—The Diamond State Fibre Co. usually send out inquiries on its annual fuel contract about Feb. 1, and conclude the business on Apr. 1. They require approximately 30,000 tons, and deliveries are made by Philadelphia & Reading and Pennsylvania railroads. Address Pur. Agt. Yates, The Diamond State Fibre Co., Bridgeport, Conn.

1785—Bridgeport, Conn.—The A. H. March Packing Co. usually send out inquiries for its annual fuel requirements about Feb. 1, and conclude the contract on Apr. 1. Deliveries are made by Philadelphia & Reading Ry. Address Pur. Agt. March, The A. H. March Packing Co., Bridgeport, Conn.

1786—Chester, Penn.—A. P. Musselman usually sends out inquiries for his annual fuel requirements, involving approximately 600 tons on Feb. 1, and the business is concluded on Apr. 1. Address A. P. Musselman, Chester, Penn.

1787—Chicago, Ill.—The requirements of the Hirsh, Stein & Co., involving about one car per day of Illinois and Indiana lump coal, will be purchased in the open market. Address Pur. Agt. J. Tecka, Hirsh, Stein & Co., 2841 S. Ashland Ave., Chicago, Ill.

1788—Philadelphia, Penn.—The S. J. Creswell Iron Works is in the market for its annual fuel supply, involving approximately 2,000 tons of steamboat and rice coal. The contract becomes effective Jan. 1. Address Secretary, The S. J. Creswell Iron Works, 23rd and Race St., Philadelphia, Penn.

1789—Coatesville, Penn.—Worth Brothers at this place usually send out inquiries on their annual contract, involving approximately 13,500 tons about Feb. 1, and conclude the business on Apr. 1. Deliveries are made by Philadelphia & Reading and Pennsylvania railroads. Address Pur. Agt. Cairnes, Worth Brothers Co., Coatesville, Penn.

1790—Coatesville, Penn.—J. Shallcross & Son usually send out inquiries on their annual fuel requirements about Feb. 1, and conclude the business on Apr. 1. Deliveries are made by Pennsylvania R.R. Address Purchasing Agent, J. Shallcross & Son, Coatesville, Penn.

1791—Conshohocken, Penn.—J. Wood Brothers & Co. at this place usually send out inquiries for its annual fuel requirements, involving approximately 40,000 tons, about Feb. 1, and conclude the contract about Apr. 1. Deliveries are made by the Philadelphia & Reading and Pennsylvania railroads. Address Pur. Agt. Wood, J. Wood Bros. & Co., Conshohocken, Penn.

1792—Chicago, Ill.—The contract of C. F. Claussen & Co., at this place will be negotiated about Feb. 1. Approximately 28 cars of washed nut coal will be required. Address Pur. Agt. H. D. Claussen, C. F. Claussen & Co., 5147 S. Western Ave., Chicago, Ill.

1793—Camden, N. J.—The Southwark Steel Co. at this place usually send out inquiries for its annual fuel contracts, involving approximately 35,000 tons of bituminous and coke about Feb. 15, and conclude the business on Mar. 1. Address Pur. Agt. Hanson, Southwark Steel Co., Camden, N. J.

1794—Camden, N. J.—The West Jersey Paper Manufacturing Co. usually send out inquiries for its annual fuel contracts involving approximately 5,000 tons on Feb. 1 and conclude the business on Apr. 1 Deliveries are made by water. Address Pur. Agt. Stafford, West Jersey Paper Manufacturing Co., Camden, N. J.

1795—Harrisburg, Penn.—The Harrisburg Pipe and Pipe Bending Co. at this place usually send out inquiries for its annual fuel requirements about Feb. 1 and conclude the business about Apr. 1. The company requires about 50,000 tons of gas coal and 250,000 tons of low volatile bituminous. Deliveries are made by the Pennsylvania R.R. Address Pur. Agt. W. P. Hildrup, Jr., Harrisburg Pipe and Pipe Bending Co., Harrisburg, Penn.

1796—Mays Landing, N. J.—The Atlantic Brick Manufacturing Co. at this place usually send out inquiries for its annual contract involving approximately 5,000 tons on Feb. 1 and conclude the business on Apr. 1. Address Pur. Agt. T. LaRue, Bartlett Building, Atlantic City, N. J.

1797—New York City, N. Y.—The Warren Manufacturing Co. at this place usually send out inquiries for its annual fuel contracts about Feb. 15, and conclude the business on Apr. 1. The company uses Lehigh rice and buckwheat coal. Address Pur. Agt. R. G. Spencer, Warren Manufacturing Co., 41 Park Row, New York City.

1798—New York, N. Y.—The Cuneo Importing Co. usually send out inquiries for its annual fuel requirements about Feb. 15, and conclude the business on Apr. 1. The company has boats at both New York and Philadelphia, and require about 20,000 tons at the former and 100,00 tons at the latter place. The New York point of delivery is at Pier 10, North River. Address Pur. Agt. Spado, Cuneo Importing Co., Pier 10, North River, New York City.

1799—Plymouth, Penn.—The American Magnesia Covering Co., usually send out inquiries for its annual fuel contracts about Feb. 15, and concludes the business about Apr. 1. Address Pur. Agt. Crabbs, American Magnesia Covering Co., Plymouth, Penn.

1800—Philadelphia, Penn.—The Girard Iron Works at this place is in the market for its annual fuel supply, involving approximately 800 tons of anthracite rice coal. Address Purchasing Agent Girard Iron Works, 22nd and Allegheny Ave., Philadelphia, Penn.

1801—Upland, Penn.—The Chessaqua Silk Co. usually send out inquiries on their annual fuel contract, involving approximately 2,000 tons on Feb. 1 and the contract is concluded about Mar. 1. The company requires about 2,000 tons, and deliveries are by Philadelphia & Reading Ry. Address Pur. Agt. Thomas, Chessaqua Silk Co., Upland, Penn.

1802—Westchester, Penn.—The Westchester I. & C. S. Co. usually send out inquiries for its annual coal contract involving approximately 2,500 tons about Feb. 1, and the business is concluded in Apr. 1. Deliveries are by Philadelphia & Reading Ry. Address Purchasing Agent, Westchester I. & C. Co., Westchester, Penn.

1803—Westchester, Penn.—The Westchester Gas Co. usually sends out inquiries for its annual fuel contract involving approximately 600 tons about Feb. 1, the business being concluded on Apr. 1. Deliveries are by Philadelphia & Reading Ry. Address Pur. Agt. Samson, Westchester Gas Co., Westchester, Penn.

1804—Allentown, Penn.—The American Steel and Wire Co. at this place usually send out inquiries for its annual coal contract about Feb. 1, the business being concluded on Apr. 1. They require about 24,000 tons of buckwheat No. 2 and 12,000 tons of gas slack. Deliveries are made by Lehigh Valley R.R. Address Pur. Agt. E. E. Stone, American Steel and Wire Co., Cleveland, Ohio.

1805—Allentown, Penn.—The National Silk Die Works at this place usually send out inquiries for its contracts involving approximately 100,000 tons of coal, about Feb. 1. Deliveries are made by Lehigh Valley and Central Railroad of New Jersey. Address Pur. Agt. Lotte, National Die Works, Allentown, Penn.

1806—Allentown, Penn.—The Allentown Flint Bottle Works usually send out inquiries for its annual contract about Feb. 1, and the business is concluded about Apr. 1. The contract involves approximately 50,000 tons of low sulphur gas coal, and deliveries are made by Lehigh Valley Ry. Address Purchasing Agent, Allentown Flint Bottle Works, Allentown, Penn.

1807—Ambler, Penn.—The Keasbey & Mattison Co. at this place usually send out inquiries on its annual coal contract about Feb. 1, and conclude the business in Apr. 1. Deliveries are made by Philadelphia & Reading Ry. Address Purchasing Agent, Keasbey & Mattison Co., Ambler, Penn.

+1808—Easton, Penn.—The City Government is receiving bids for furnishing the electric-light station with approximately 1,500 gross tons of buckwheat, 90 tons of stove for the central fire station and four other engine houses, and 70 tons of stove for the municipal building. Bids must be submitted on blank forms, which may be obtained on application, and must be accompanied by certified check for $100. Address City Clerk, Easton, Penn.

1809—Jackson, Mich.—The Peninsular Portland Cement Co. will negotiate its annual contract, involving approximately 40,000 tons of coarse slack coal, some time in February. Deliveries are made by railroad, in equal monthly proportions. Address Pur. Agt. G. V. Cody, Peninsular Portland Cement Co., Jackson, Mich.

1810—Cumberland, Md.—Bids will be received until 9 a.m., Dec. 27, for furnishing the local electric-light plant with mine-run coal as may be required during the ensuing year. Bids should be on a long-ton basis and both in car lots, f.o.b. Smith's siding, and delivered in boiler room. Address Comr. J. S. Schriver, Water and Light Dept., Cumberland, Md.

1811—St. Louis, Mo.—The Jack Daniels Distilling Co. will begin testing out various grades of 2-in. lump coal preparatory to negotiating its annual fuel requirements, involving about 130 tons per month, on Jan. 1. Address Pur. Agt. Harry Newsham, Jack Daniels Distilling Co., St. Louis, Mo.

1812—Buffalo, N. Y.—The Morlook Collieries Co. at this place is in the market for a tonnage of Pocahontas and New River Smokeless coal for prompt shipment. Address the Morlook Collieries Co., 876 Ellicott Sq., Buffalo, N. Y.

+1813—Greenfield, Ind.—Bids are being received for furnishing the County Heating Plant and Poor Farm, with approximately 800 tons of mine-run, 1¼-in. lump and egg coal. This contract is usually let through a local dealer. Address Purchasing Agent, County Poor Farm, Greenfield, Ind.

1814—Homestead, Penn.—Bids will be received until Jan. 1 for furnishing the local Water-Works with slack coal as may be required during the ensuing year. Bids should be made f.o.b. cars at the water-works siding. Address Borough Clk. Frank Trautman, Homestead Water-Works, Homestead, Penn.

+1815—Moose Jaw, Saskatchewan, Can.—Bids will be received until noon, Dec. 30, for furnishing the City Power Plant with its annual fuel supply, involving approximately 12,000 tons of coal. Address Comr. Jas. Pascoe, City Comr., Moose Jaw, Saskatchewan, Can.

1816—St. Louis, Mo.—The Mine La Motte Co. is in the market for its annual fuel supply, involving approximately 1,500 tons of 1½-in. screenings and 1,200 tons of mine-run per month, deliveries to be made by Iron Mt. R.R. to Mine La Motte, Mo. Address Gen. Mgr. A. J. Meier, Mine La Motte Co., St. Louis, Mo.

1817—Toledo, Ohio—The Big Four Coal Co. is in the market for two cars of ¾-in. lump or egg coal per month, deliveries to continue until Apr. 1. Address General Manager The Big Four Coal Co., Toledo, Ohio.

1818—Chicago, Ill.—The Midland Linseed Products Co. will purchase its annual fuel requirements, involving approximately 5,000 tons Indiana screenings, in the open market. Address Pur. Agt. P. A. Brett, Midland Linseed Products Co., 927 Blackhawk St., Chicago, Ill.

1819—Chicago, Ill.—Byrne Brothers Dredging and Engineering Co. will contract for its annual fuel requirements, involving approximately 5,000 tons, some time during the early part of the year. Illinois lump coal is required. Address Pur. Agt. Schumaker, Byrne Bros. Dredging and Engineering Co., Chicago, Ill.

+1820—Somerset, Penn.—The Town Council will receive bids until 2 p.m., Dec. 28, for furnishing and delivering coal as may be required for the local pumping station and municipal building, during the ensuing year. Mine-run coal is required. Address Secy. C. E. Pile, Town Council, Somerset, Penn. (No. 467, Vol. 7, pp. 628, 750).

1821—Decatur, Ill.—The Staley Manufacturing Co. is receiving bids for furnishing its annual fuel requirements, involving approximately 150 tons of screenings per day. Address Supt. A. E. Chamberlain, Staley Mfg. Co., Decatur, Ill.

+1822—Williston, N. D.—Bids will be received until 8 p.m., Dec. 31, for furnishing the library building with lignite coal as may be required during the ensuing year. A certified check for $50 must accompany each bid, and the successful bidder will be required to furnish a bond for $200. Address Secy. H. G. Hanson, Library Bd., Williston, N. D.

+1823—Canton, Ohio—Bids will be received until noon, Dec. 30, for furnishing the local pumping station with No. 8 Pittsburgh nut and slack coal as may be required during the ensuing year. Bids must be made f.o.b. pumping station, and must be accompanied by a certified check for $200. All bids must be submitted on blank forms, which may be obtained on application. Address Dir. Z. W. Kent, Pub. Ser., Canton, Ohio.

1824—St. Louis, Mo.—The St. Louis Smelting and Refining Co. is in the market for its annual fuel requirements at the Collinsville, Ill., plant. About one or two cars per day of mine-run, lump and screenings are needed. Address Secy. J. A. Caselton, St. Louis Smelting and Refining Co., International Life Bldg., St. Louis, Mo. (No. 427, Vol. 7, p. 568).

1825—Willimantic, Conn.—Max Pollock & Co. at this place usually contract for its annual fuel requirements, involving approximately 60 tons per month, some time in February. The company has storage capacity for 400 tons, and deliveries are made by railroad and wagon. Address Purchasing Agent Max Pollock & Co., Willimantic, Conn.

1826—Chicago, Ill.—The Illinois Improvement and Ballast Co. will purchase its requirements, involving five or six cars of Indiana 4th and 5th vein lump, Montgomery and Marion County, Ill., lump per month, in the open market. Address Pur. Agt. C. E. Celes, Illinois Improvement and Ballast Co., 298 S. La Salle St., Chicago, Ill.

1827—Conshohocken, Penn.—The Alan Wood Iron and Steel Co. is in the market for its annual fuel supply, involving approximately 500 tons of broken coal, deliveries to begin Jan. 1. Address Pur. Agt. A. D. Wood, The Alan Wood Iron and Steel Co., Widener Bldg., Philadelphia, Penn.

1828—Kansas City, Mo.—The Ford Laundry Co. at this place has abandoned the use of oil, and will require approximately 100 tons of coal per month. No permanent contract has as yet been negotiated. Adress purchasing Agent The Ford Laundry Co., Kansas City, Mo.

1829—Philadelphia, Penn.—The St. Timothy's Hospital is receiving bids on its annual fuel contract, involving approximately 1,000 tons of pea coal, deliveries to begin Jan. 1. Address Secy. J. V. Merrick, St. Timothy's Hospital, Wissahickon, Philadelphia, Penn.

1830—Ft. Wayne, Ind.—The Evans Coal Co. at this place is in the market for approximately 150 cars of 4-in. or 6-in. Ohio, West Virginia or Kentucky mine-run coal, delivery to be made between Jan. 1 and Apr. 1. Address Purchasing Agent The Evans Coal Co., Ft. Wayne, Ind. (No. 1670, Vol. 8, p. 912).

1831—Philadelphia, Penn.—The Philadelphia Warehouse and Cold Storage Co. is in the market for its annual fuel supply, involving approximately 8,500 tons of buckwheat coal, delivery to be made during the year beginning Jan. 1. Address Secretary Philadelphia Warehouse and Cold Storage Co., Delaware Ave. and Noble St., Philadelphia, Penn.

1832—Wilmington, Del.—The Lobell Car Wheel Co. is in the market for its annual fuel supply, involving approximately 2,000 tons of broken coal per annum, deliveries to be made during the year beginning Jan. 1. Address Purchasing Agent, Lobell Car Wheel Co., Wilmington, Del.

1833—Kansas City, Mo.—The Speth's Domestic Laundry will return to the use of coal on Jan. 1, and will be in the market for tonnage equivalent to 500 bbl. of oil monthly. Address Purchasing Agent Speth's Domestic Laundry, Kansas City, Mo.

1834—Philadelphia, Penn.—The Wabash Mills Co. is conducting a series of tests with a view to substituting anthracite buckwheat coal for bituminous, which they have been using for a number of years past. If satisfactory results are obtained from the tests, about 1,000 tons of coal will be required which will be purchased on a contract, becoming effective Jan. 1. Address Purchasing Agent Wabash Mills Co., Manayunk, Philadelphia, Penn.

+1835—Philadelphia, Penn.—The City Government will receive bids until Dec. 29 covering its annual fuel requirements during the year beginning Jan. 1. Address Dir. Herman Loeb, Dept. of Supplies, City Hall, Philadelphia, Penn. (No. 22, Vol. 6, p. 933; No. 1516, Vol. 8, pp. 577, 660; No. 1573, Vol. 8, pp. 699, 828; No. 1650, Vol. 8, p. 871).

1836—New Castle, Del.—The American Manganese Steel Co. is in the market for its annual fuel requirements, involving approximately 1,000 tons of broken coal, deliveries to begin Jan. 1. Address Pur. Agt. N. C. Peebles, American Manganese Steel Co., McCormick Bldg., Chicago, Ill.

1837—Philadelphia, Penn.—The Kingan Provision Co., packers, usually contract for its fuel requirements, involving approximately 1,200 tons of anthracite buckwheat coal per annum, about Jan. 1. Address Purchasing Agent Kingan Provision Co., 8th and Willow St., Philadelphia, Penn.

+1838—Fort Benton, Mont.—The Choteau County Commissioners will receive bids until 10 a.m., Jan. 3, for furnishing coal as may be required at the Court House and Jail during the ensuing year. Address Clk. Lester M. Bond, Bd. of County Comrs., Fort Benton, Mont.

1839—Graniteville, S. C.—The Graniteville Manufacturing Co. usually contracts for its annual fuel requirements, involving approximately 500 tons of Pocahontas mine-run steam coal per month in February. Deliveries are made by railroad, and the company has a storage capacity for 1,500 tons. Address Supt. W. A. Giles, Graniteville Manufacturing Co., Graniteville, S. C.

1840—Philadelphia, Penn.—Hance Bros. & White, manufacturer of drugs, is in the market for its annual fuel supply, involving approximately 1,000 tons of anthracite buckwheat and rice coal. Address Purchasing Agent Hance Bros. & White, Willow and Marshall St., Philadelphia, Penn.

1841—Kansas City, Mo.—The Ideal Laundry at this place has abandoned the use of fuel oil, and will require approximately 100 tons of coal per month. It is understood that there is no permanent contract as yet. Address Purchasing Agent The Ideal Laundry, Kansas City, Mo.

1842—Philadelphia, Penn.—The Niles-Bement-Pond Co., machine manufacturers, will contract for its annual fuel supply, involving approximately 900 tons of steamboat coal, about Jan. 1. Address Purchasing Agent Niles-Bement-Pond Co., Nicetown, Philadelphia, Penn.

1843—Gloucester, N. J.—The Welsbach Co., manufacturer of gas mantles, will contract for its annual fuel requirements, involving approximately 1,000 tons of anthracite broken coal, about Jan. 1. Address Purchasing Agent Welsbach Co., Gloucester, N. J.

1844—Philadelphia, Penn.—Collins & Aikman Co., paper manufacturer, will contract for its annual fuel requirements, involving approximately 1,500 tons of buckwheat coal, about Jan. 1. Address Purchasing Agent Collins & Aikman Co., Manayunk, Philadelphia, Penn.

+1845—Omaha, Neb.—The City Government will receive bids until 10 a.m., Dec. 28, for furnishing approximately 2,000 tons of Cherokee Kansas nut, 1,000 tons of steam, and several other grades in smaller amounts, deliveries to be made both by wagon and carloads, and to begin Jan. 1. Address City Clk. T. J. O'Connor, Omaha, Neb.

1846—Princeton, Ind.—The Gibson County Commissioners will receive bids until Dec. 27 for furnishing the fuel requirements for the county during the ensuing year. Address Aud. W. T. Roberts, Gibson Co., Princeton, Ind.

1847—Mare Island, Calif.—The Navy Department is in the market for 300 tons of coke for delivery at the Navy Yard at this place. The purchase is being negotiated under schedule No. 9147. Address Paymaster General of the Navy Samuel McGowan, Washington, D. C.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

1660—East St. Louis, Ill.—This contract (p. 911), which provides for furnishing the Obear-Nester Glass Co. with its annual fuel requirements, involving a total of about 400 tons per week, has been awarded to the **E. F. Wickham Coal Co.;** the contract for the steam coal, involving about 100 tons per week has been sublet to the **Lenz Coal Co.** The coal for the gas producer, about 300 tons per week, will be supplied from the Wickham mine at Duquoin. Address Supt. Jos. Nester, the Obear-Nester Glass Co., East St. Louis, Ill.

+1667—Ironton, Ohio—The readvertisement for bids on this contract (pp. 912, 998), which provides for furnishing the coal requirements for the local pumping station during the ensuing year, brought out the following bids: **Andrew Geil**, clean lump, $1.90; lump, nut and pea, $1.70; mine-run, $1.50. Wm. W. Sites, clean lump, $1.84. The contract was awarded to **Andrew Geil** on his bid of $1.70 for lump, nut and pea coal. Address Clk. F. A. Ross, Public Service, Ironton, Ohio.

1668—St. Louis, Mo.—This contract (p. 912), which provides for furnishing the St. Louis Car Co. with approximately 125 tons of nut coal per week, has been awarded to the **Devoy & Kuhn Coal Co.** The contract will expire on Apr. 1. Address Pur. Agt. E. B. Meissner, St. Louis Car Co., St. Louis, Mo.

1691—St. Louis, Mo.—This contract (p. 957), which provides for furnishing the American Paper Products Co. with its annual coal supply, involving approximately 200 tons of 1¼-in. screenings per month, has been awarded to the **Mt. Olive & Staunton Coal Co.** It is understood that an extra supply of storage coal will be furnished to the company under this contract to provide against a suspension of mining operations Apr. 1. Address Pur. Agt. Pollock, American Paper Products Co., St. Louis, Mo.

+1696—Elmira, N. Y.—This contract (p. 957), which provides for furnishing the local Water Board with approximately 2,000 tons of bituminous mine-run during the ensuing year has been awarded to the **Ralston Coal Co.,** at $2.25 per ton. Address Gen. Mgr. H. M. Beardsley, Water Board, Elmira, N. Y.

1726—Elkhart, Ind.—This contract (p. 999), which provides for furnishing the Elkhart Bristol Board and Paper Co. with approximately 3,500 tons of mine-run coal, has been awarded to the **Wyatt Coal Co.** Address Pres. C. E. Frye, Elkhart Bristol Board and Paper Co., Elkhart, Ind.

1756—Delphos, Ohio—The contract of the Delphos Gas Co. (p. 1043), is covered until Dec. 1, 1917. The contract involves 2,500 tons per annum instead of 600 tons as previously noted. Address Pur. Agt. W. M. Moran, Delphos Gas Co., Delphos, Ohio.

Contract Notes

East St. Louis, Ill.—Carter Brothers have contracted with the **Lumaghi Coal Co.** for 350 tons of "Cantine" 6-in. lump per month.

St. Louis, Mo.—The Thos. Ryan Coal Co. has contracted with the Southern Coal, Coke and Mining Co. for a tonnage of New Baden lump coal.

St. Louis, Mo.—The Weisenborn Coal Co. has awarded the **Searles Coal Co.** a contract covering its requirements of Illinois high grade McClintock coal.

Belleville, Ill.—The Belleville coal dealers have announced that no more coal will be sold on credit, due to the heavy losses that have been sustained from this cause.

St. Louis, Mo.—The Missouri Can Co. have contracted with the **Taylor Coal Co.** for 250 tons of "Energy" screenings per month. Address Pur. Agt. F. M. Payne, The Missouri Can Co., St. Louis, Mo.

St. Louis, Mo.—The Vanadlia R.R. Co. has begun storing 20,000 tons of lump coal at the Rose Lake yard in East St. Louis. The coal is being furnished by the **Lumaghi Coal Co.,** and the **Consolidated Coal Co.**

Chester, Penn.—The Keystone Plaster Co., at this place is experimenting with fuel oil and if successful they will discontinue the use of anthracite coal. Address Pur. Agt. Keystone Plaster Co., Chester, Penn.

Charleston, W. Va.—Press reports state that the Imperial Coal and Coke Co. and the Christian Colliery Co. have closed a contract with a Middle Western manufacturing concern, involving 120,000 tons, deliveries to be made during the year beginning Apr. 1.

Cincinnati, Ohio—The Peters Cartridge Co. has contracted with the **Wyatt Coal Co.** for 5,000 tons of West Virginia egg coal for delivery at the Kings Mill plant during the ensuing year. Address Pur. Agt. G. W. Collins, Peters Cartridge Co., Cincinnati, Ohio.

Granite City, Ill.—The contract of the National Stamping and Enameling Co., will be filled on 2 in. screenings instead of 1½ in. as previously announced (p. 959). Address Pur. Agt. R. C. Lutton, National Enameling and Stamping Co., Granite City, Ill.

Louisville, Ky.—The contract of the Louisville Ry. Co. (p. 1,045), involving over 100,000 tons of pea and slack coal per annum, does not expire until March, 1917. Address Supt. of Motive Power, F. H. Miller, Louisville Ry. Co., 326 W. Jefferson St., Louisville, Ky.

Harrisburg, Ill.—The Southern Illinois Railway and Power Co. consumes approximately 10,000 tons of special nut coal per annum. The company has a six-year contract and deliveries are made daily over their own lines. Address Pur. Agt. C. F. Richardson, Southern Illinois R.R. and Power Co., Harrisburg, Ill.

Baltimore, Md.—Press reports are to the effect that the Elkhorn Coal Corporation has concluded a deal with the United States Steel Corporation involving between 5,000,000 and 7,000,000 tons of coal for the steel company's plant at Gary, Ind. Deliveries are to be made during the next three years or more.

St. Louis, Mo.—The contract for furnishing the New Standard Adding Machine Co. with approximately 100 tons of coal per month has been awarded to the **Polar Wave Ice and Fuel Co.** on Standard 2 in. lump coal. Deliveries are made by wagon. Address Pur. Agt. J. M. Anderson, New Standard Adding Machine Co., St. Louis, Mo.

Selma, Ala.—The Selma Lighting Co. consumes approximately 6,000 tons of nut and slack and 3,000 tons of No. 2 in. lump coal per annum, deliveries being made by railroad at the rate of about 700 tons per month. The company has storage capacity for 1,500 tons. Address Pur. Agt. R. L. Ellis, Selma Lighting Co., Selma, Ala.

Moncton, N. B., Can.—The Moncton Tram Electric and Gas Co. consumes about 7,500 tons of screened nut coal per annum, deliveries being made by railroad at the rate of approximately 600 tons per month. Purchases are confined to the open market and the company has a storage capacity of 1,000 tons. Address Pur. Agt. A. B. Coryell, Moncton Tram Electric and Gas Co., Box 23, Moncton, N. B., Can.

Eagle Pass, Tex.—The Olmos Coal Co., has received a number of large orders for coal to be delivered in various parts of Mexico. Deliveries have recently been impossible due to the revolution but conditions are now being rapidly restored to normal. It is understood that the company has orders for at least 50,000 tons. The Carranza Government has announced that no import duty will be charged on coal.

CO

COAL AGE

With which is Consolidated The Colliery Engineer

Volume 8, No. 26
Issued Every Saturday
Hill Publishing Company

NEW YORK, DECEMBER 25, 1915

Price, Ten Cents
Contents, First Page
Advertising Index, Last Page

Glad to Hear
This Interested You

BELOW will be found brief answers to some of the questions asked during the meeting of the Coal Mining Institute held at Fairmount, W. Va., Dec. 8 and 9, 1915.

This Locomotive Operates on an 18% Grade.

WHY two trolley poles? Using polyphase currents require two poles and a ground.

Does it consume more power than an ordinary locomotive? Conditions being the same the power consumed would be less, because this locomotive weighs less than any kind of wheel traction locomotive.

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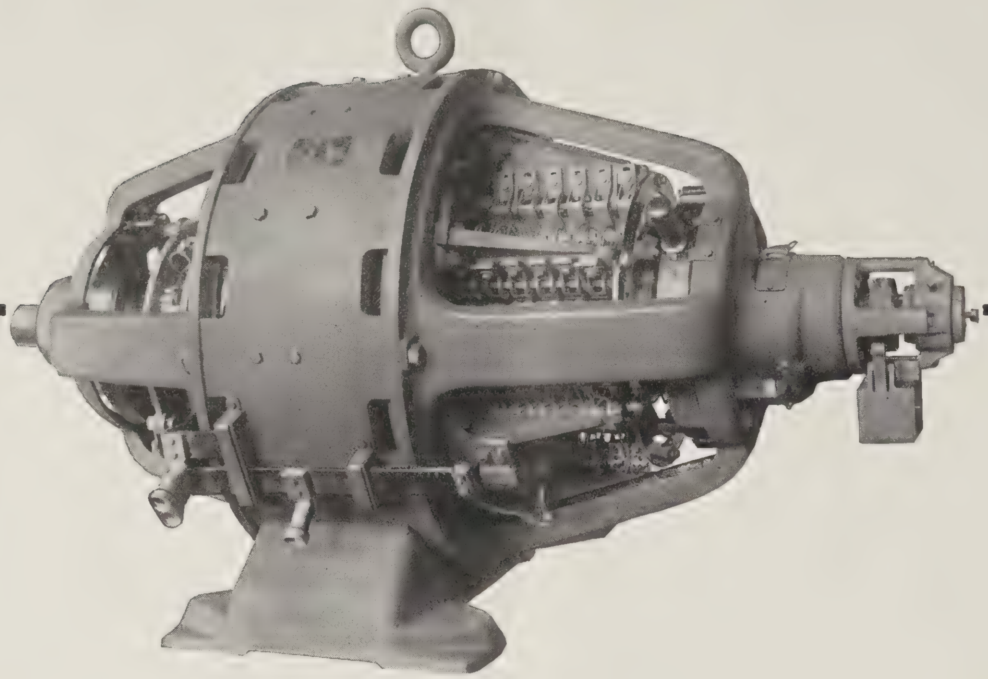

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Combine absolute reliability with the highest efficiency ever obtained on rotary converters of equal capacities. They are built especially for mining service, and will hang to the load in spite of violent fluctuations and will avoid delays due to shutdowns.

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COAL AGE

FLOYD W. PARSONS, *Editor*

Published Weekly by HILL PUBLISHING COMPANY
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NUMBER OF COPIES PRINTED THIS ISSUE, 12,300

None sent free regularly, no returns from news companies, no back numbers.

THE WEEKLY ROUND TABLE

By The Ad Editor

THAT *Happiness*
and Prosperity
may be yours during
1916 *is the Christmas*
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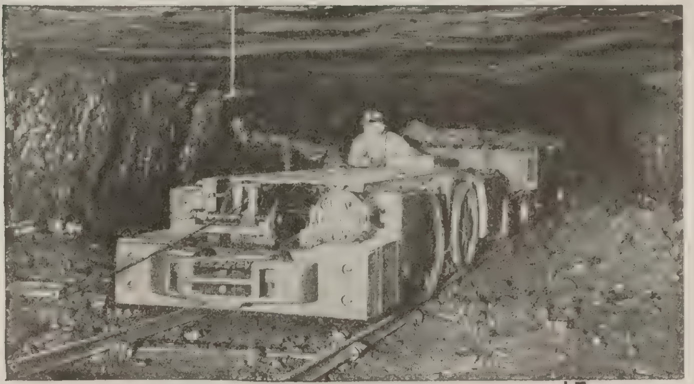
How Are Your Haulage Conditions?

Are your expenses for men and mules shooting skyward? Are your workings congested? Do you feel that your present motor haulage is costing too much?



If there is any question in your mind as to whether your haulage conditions could be bettered, consult with the Jeffrey Engineers. Put the problem squarely up to them and learn whether or not we could help reduce the cost of your output.

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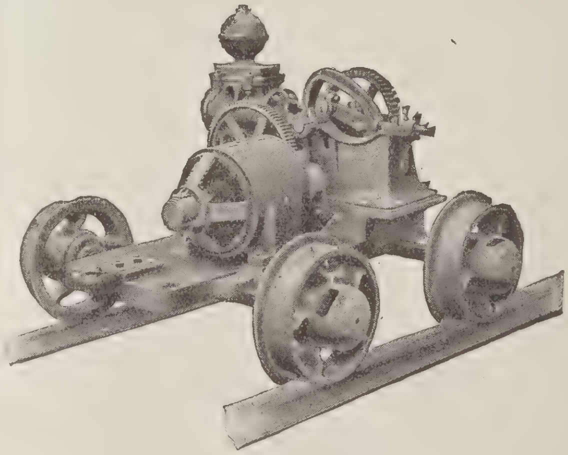

Other facts too, make this particular pump of vital importance to you. Write for bulletin No. 13.

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Fairmont - - - - - West Virginia

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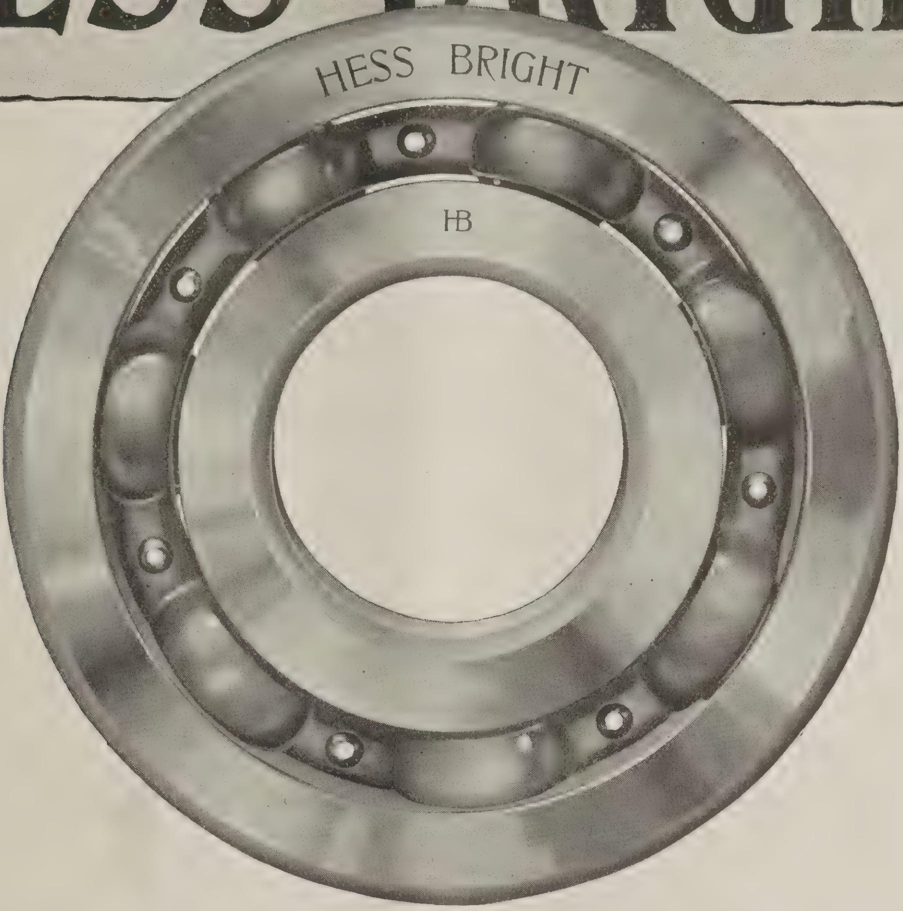

It is unjust to the expensive design, material and workmanship of a mine locomotive to equip it with inferior bearings. Inferior bearings put the whole locomotive in a bad light —increase its upkeep, decrease its reliability. Wherefore the importance of choosing HESS-BRIGHTS.

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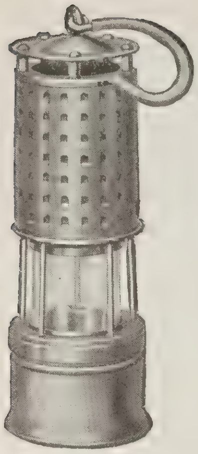

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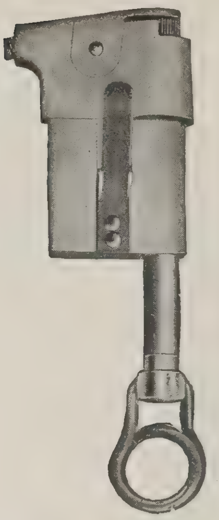

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Koehler Manufacturing Co., Marlboro, Mass.

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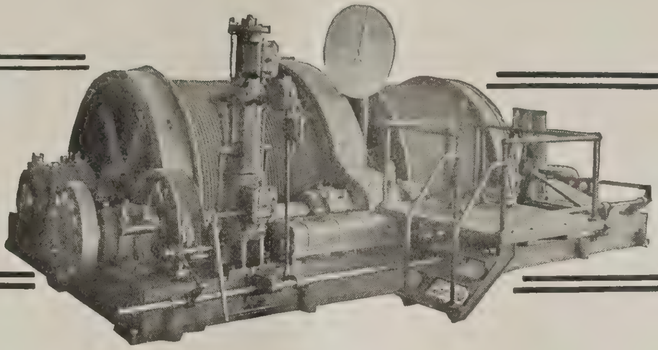


Buying Hoists is Buying *Transportation*

Suppose you are going from Someplace, N. Y. to Somewhere, Cal., and have five routes from which to choose.

Naturally, you want the very best route and train service, with a reputation for speed, punctuality and reliability. When you have satisfied yourself, you'll probably buy your transportation over the route that looks best to you.

Some people defer their choice to the last minute, and then rush up to the Slow & Lonely's ticket window, and dash for the train, without even knowing whether or not there's a diner.

Pretty much the same condition—only in a larger sense—confronts a man buying hoists; for hoists are transportation.

Any old last-minute hoist won't do in the long run. It's more than just a question of enough power.

Rather start earlier and investigate among the reputable builders.

Our engineering department will gladly assist in this investigation, and prepare special designs if necessary.

Do this—you'll get there faster in the end.

VULCAN IRON WORKS

1730 Main Street
New York

Wilkes-Barre, Pa.
Chicago

Vulcan Hoists

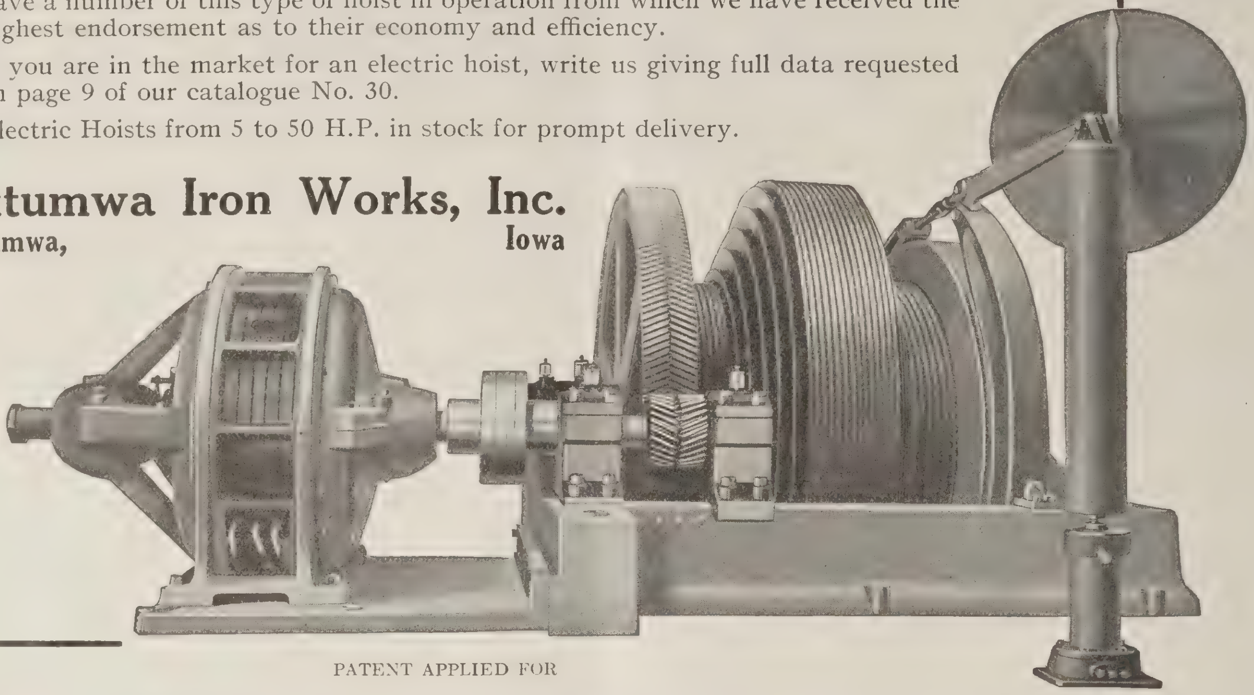
OTTUMWA High Efficiency Electric Hoists

You can reduce your power cost by this design of Electric Hoist. It also reduces first cost by making possible a smaller motor, consequently reducing the maximum demand charge. The brake is operated by oil under pressure, and is equipped with overwinding device, and automatic emergency application. We have a number of this type of hoist in operation from which we have received the highest endorsement as to their economy and efficiency.

If you are in the market for an electric hoist, write us giving full data requested on page 9 of our catalogue No. 30.

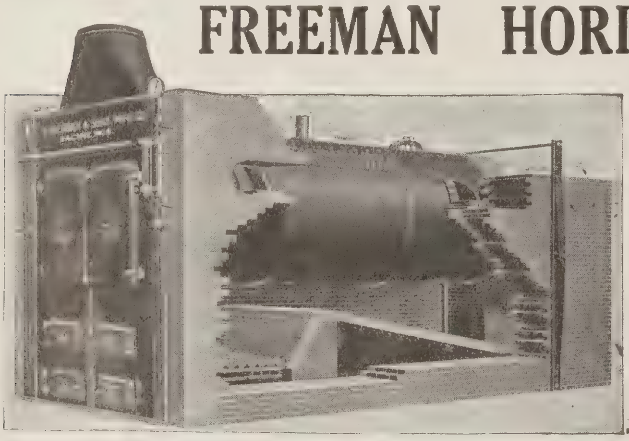
Electric Hoists from 5 to 50 H.P. in stock for prompt delivery.

Ottumwa Iron Works, Inc.
Ottumwa, Iowa



PATENT APPLIED FOR

FREEMAN HORIZONTAL TUBULAR BOILER



The product of master boiler builders. Our 48 years' experience in boiler building is at your service.

Bulletin 47 mailed on request.

Write for it now.

The S. Freeman & Sons Mfg. Co.
Established 1868
General Office and Works: Racine, Wis.
Chicago Office: 530 Monadnock Building

A CHOICE OF HOISTS

For mining, contracting, pile driving or lumbering, the choice of a hoist should not be made until all requirements are carefully considered.

Under severe conditions FLORY HOISTS are demonstrating their staying qualities.

For very strenuous duty, specify the WERNER PATENTED BAND FRICTION and you get not only the best, but the simplest and most easily-operated friction.

Flory hoists are fully guaranteed. Write for complete details.

S. FLORY MFG. CO.
BANGOR PENNA.

HOISTING ENGINES - FANS

"Crawford" Lead-Lined Pump Steam Electric

Highest Grade Equipment. Newest Improved Designs. Modern New Shops.

GET BULLETINS.

CRAWFORD & McCRIMMON CO., Est'd 1869 Brazil, Ind., U.S.A.

WATERBURY
WIRE ROPE

of Standard and Armored Construction. Manila and Sisal Cordage. Fibreclad Wire Rope. We make Ropes for every purpose. **Write for prices.**

WATERBURY COMPANY
63 Park Row New York
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"PATENTSTEEL" ROPE

The Extremely Flexible Rope

Patentsteel—the ideal wire rope for coal mining haulage and lifting problems where sharp turns are to be navigated or where the rope is wound around small drums.

Service is built in every foot of this rope—service in which you need not fear trouble from unwarranted wearing out or loss of elasticity.

Patentsteel Wire Rope is built to serve.

Catalog 10 will tell more—write for your copy.

Broderick & Bascom Rope Co.
809 No. Main Street, St. Louis, Mo.
Branches—Seattle, New York

"119"
KEYSTONE
GREASE
for mine car wheels

NO. 119 KEYSTONE GREASE is made especially for the lubrication of mine car wheels and shows wonderful efficiency under all working conditions, winter or summer.

It furnishes lubrication for every turn of the wheels—absolutely without waste. It will save more in wheels and axles than **all** your lubrication costs you now.

Here's what we propose to do for you

We will ship enough No. 119 Keystone Grease to furnish the lubrication for a given number of your cars for 60 days from date of installation. We will arrange the co-operation of our mechanical department in making the installation, and guarantee at least 10% saving over the present method of lubrication, labor considered.

Keystone Lubricating Company

New York
Boston
Pittsburgh
Chicago
Savannah

Executive Offices and Works:
Philadelphia, Pa.
Established 1884

New Orleans
St. Louis
Denver
San Francisco
Minneapolis

General European Office and Warehouse, Manchester, Eng.

226

This
trade-mark
the Guarantee of
Excellence on
Goods Electrical

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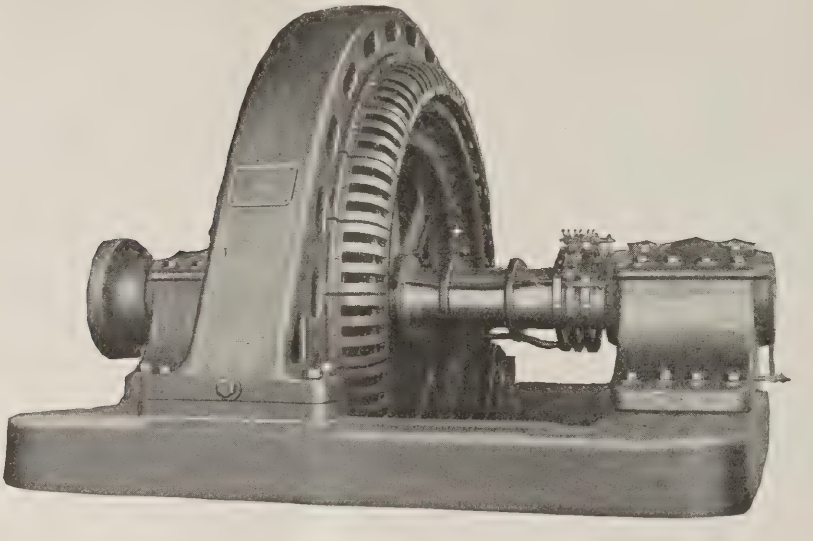
For Michigan business refer to General Electric Company of Michigan, Detroit, Mich.

For Texas, Oklahoma and Arizona business refer to Southwest General Electric Company (formerly Hobson Electric Co.), Dallas, El Paso, Houston and Oklahoma City.

For Canadian business refer to Canadian General Electric Company, Ltd., Toronto, Ont.

Motor Agencies in all large cities and towns.



Over twice as large as any A. C. hoist motor in America

An 1800 h. p. G-E alternating current hoist motor and control equipment has been ordered by the Tennessee Coal, Iron and Railroad Co. for the following duty:

Hoist unbalanced.	
Length of haul (maximum)...............	5280 ft.
Angle between shaft and horizontal (average) approx..............................	40 per cent.
Weight of skip or cage..................	13440 lbs.
Weight of ore per trip..................	26880 lbs.
Size of rope............................	$1\frac{3}{8}''$
Diameter of drum.......................	12 ft.
Average rope speed in feet per minute.....	2700 R.P.M.
Time for acceleration.....................	15 sec.
Time for constant running (5280 ft. level)..	106 sec.
Time for retardation.....................	8 sec.
Rest period (loading)....................	30 sec.
Number of tons (long) per hour (max.)....	150
Number of tons (long) per hour (average)..	100

Complete bulletins describing mine hoist equipment will be sent on request

General Electric Company

General Office: Schenectady, N. Y. 5727

CORE CALYX DRILLS

5-inch cores from a 1400′ borehole made by a Colorado Coal Prospector.

Mr. Julius K. Monroe, Chief Engineer of Morgantown & Kingwood Railroad Co., wrote as follows:

"*We have been paying from $2.00 to $2.25 per foot for diamond drill work with very unsatisfactory results. Since we have been operating the drill (Calyx Class F-1) ourselves, cost will run from $1.00 to $1.15 per foot, including fuel, water, expense of moving, shot, etc. Quite a saving.*

The drill referred to above was used for coal prospecting at Kingwood, W. Va. It cut about 20 feet per day through sandstone and from 10 to 15 feet in very hard quartz conglomerate. Mr. Monroe purchased also two other "Calyx" Drills, for making soundings for a hydroelectric plant."

CALYX DRILLS REDUCE CORE DRILLING COST

The "Calyx" Core Drill produces perfect cores even when penetrating broken rock and crevices.

No substance is too hard for the "Calyx" Drill. Granite, taconite, jasper and even corundum rock has been cored successfully with the "Calyx." It employs chilled shot for cutting hard rock.

Among the softer materials which have been cored with this drill are clay, shale, coal, slate, sandstone, limestone and marble. A multiple-toothed steel bit is used for the softer materials.

The secret of its economy lies in the speed with which the "Calyx" Drill penetrates the ground and the low cost of sharpening cutters and replacing worn shot.

The "Calyx" Drill gives a double record—the solid core and the cuttings, which are retained in a suitable condition for assay purposes.

The "Calyx" Core Drill is made in a complete range of sizes, styles and for various modes of drive to cut cores from $1\frac{1}{2}$ to 19 inches in diameter and from all depths to 4000 feet.

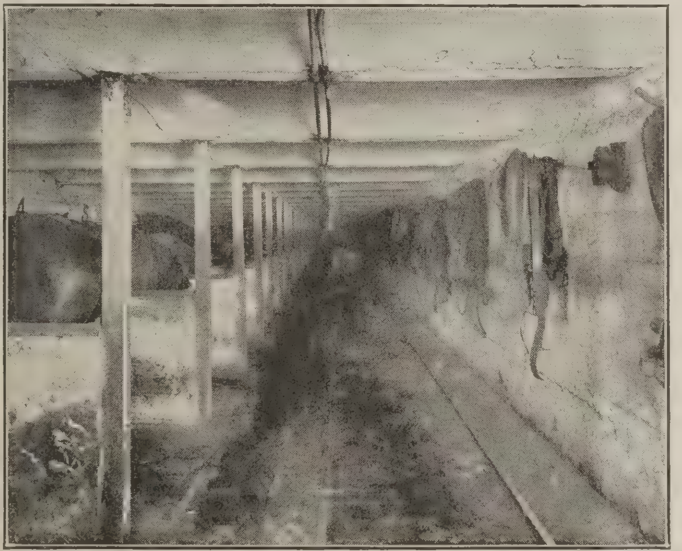
If interested in core drilling, you should not fail to send for a copy of New Catalog No. 9201. It contains a fund of information on this subject.

INGERSOLL-RAND COMPANY

New York **Offices the World Over** **London**

9-CD

Steel for Service



When a mine owner pays high prices for horses and mules it is proper for him from economic considerations as well as for their own sakes to provide them with good quarters.

The photograph shows an underground stable in the construction of which

Steel Mine Timbers

were used. It will be in good condition when the mine is finally abandoned.

Safety and welfare always go hand in hand with economic expenditure when scientific mine operation leads the way.

The mark of quality CARNEGIE It protects the user

Carnegie Steel Company

PITTSBURGH, PA.

701

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Employment Agencies
Labor Bureaus
Business Opportunities
For Sale

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Miscellaneous
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RATES: Positions Wanted, 3 cents a word, minimum charge 50 cents an insertion, payable in advance. Other advertisements, 5 cents a word, minimum charge $1.00. Count 4 words for blind address care of our New York or Chicago offices. Advertisements for bids $3.60 an inch.

ANSWERS addressed to us at 10th Ave. and 36th St., New York or 1144 Monadnock Block, Chicago will be forwarded without charge (excepting circulars or similar literature).

IMPORTANT: Original letters of recommendation or other papers of value should not be enclosed to unknown correspondents—send copies. Advertisers' names will not be furnished under any circumstances. Copy received until 10 A.M. Monday for following Saturday's issue. A

POSITIONS WANTED

DESIRE OPPORTUNITY for further advancement; now managing branch office selling electrical machinery; have technical education and eight years' general experience; can qualify for advertising manager, purchasing agent or other responsible position. PW507—Coal Age.

MINING ENGINEER open for proposition as manager or general superintendent for large coal-mining interest; extensive experience with large coal and coke operations in several states; references; can make small investment. PW504—Coal Age.

POWER PLANT ENGINEER OR ASSISTANT—Licensed man, thoroughly understanding—through experience—the care and operation of engines, boilers and auxiliary equipment; immediately available; location immaterial. PW499—Coal Age.

AS MECHANICAL ENGINEER, thoroughly experienced in the mechanical engineering of coal mines; ten years' experience in the design and operation of power plants and mining machinery. The combustion and selling of steam coals are my specialties. PW501—Coal Age.

MISCELLANEOUS

INVESTORS REPORTS a specialty; will advise on any mine work. Thomas C. Farus Worth, Civil Engineer, Sydney Mines, Nova Scotia.

BUSINESS OPPORTUNITIES

FOR SALE OR LEASE 240 acres, Cambria County Coal Lands near Patton Field. Further information on application. Signed, Samuel Heilner, Land Title Building, Philadelphia, Penn.

FOR SALE OR LEASE—Fully equipped domestic coal mine now operating capacity 250 tons; on G. T. P. Ry. at Three Hills, Alberta; nearest mine to Calgary; exceptional opportunity for practical coal operator. Union Coal Co., Limited, Three Hills, Alberta, Canada.

WE LOOK INTO THE EARTH by using diamand core drills

We test Coal & Ore land in any part of North or South America.

THE PENNSYLVANIA DRILLING CO.

formerly

THE J. A. BRENNAN DRILLING CO.

No. 30 Carson St.,
Pittsburgh, Pa.
Phone Hemlock 305

2623 Whitehall Bldg.
New York.
Phone Rector 993

For Sale

Second Hand Equipment

Rates: Less than 4 insertions 55 cents per line—4 to 11 insertions 50 cents per line—12 or more insertions 45 cents per line.

Equipment Wanted items appear at the end of this list.

ADVERTISERS' NAMES are abbreviated in most of these items. Complete names and addresses are as follows:
NEW RIVER Co., The, Macdonald, W. Va.

AIR COMPRESSORS

2 Laidlaw-Dunn-Gordon duplex 2 stage and 3 Norwalk tandem 2 stage, capacities 900 to 2100 cu.ft.—NEW RIVER.

FANS

Ventilating from 20x9 down to 10x4, d.c. to steam engines Clifford, Capell, Robinson and Bullock.—NEW RIVER.

1 Heavy construction, full housed mine fan, top horiz. discharge, overhung 10′ dia. wheel, complete with pedestal, thrust and outboard bearings and flywheel pulley; cap. 70,000 cu.ft. at 350 R.P.M.; as good as new and a bargain.—Aluminum Ore Co., East St. Louis, Illinois.

GENERATING UNITS

Generator sets direct current, 250 volt and 550 volt, direct connected and belted, capacities up to 250 kw.—NEW RIVER.

HAULAGE ENGINES

Tail rope and endless rope haulage engines.—NEW RIVER.

HOISTING ENGINES

Bargain—16x24 double cylinder, single drum direct-acting mine hoist; capacity 9,000 lb. at 750 ft. per minute; practically new.—Mead-Morrison Mfg. Co., 108-10 West Park Way, N. S., Pittsburgh, Penn.

LOCOMOTIVES

Electric—11 Baldwin-Westinghouse and Goodman, weights from 4 to 8 tons; 40″ and 44″ gauge.—NEW RIVER.

2 H. K. Porter dinkeys, 8½ and 10 tons, standard gage, good condition.—Jamison Coal & Coke Co., Oliver Bldg., Pittsburgh, Penn.

MINING MACHINES

Sullivan longwall, equipped with two 7x7 air engines, gage 40″, feed chain $\frac{9}{16}$x65′. In first-class condition and as good as new. Immediate delivery.—NEW RIVER.

4 Jeffrey, 27 B, 250 volt, 36″ gauge, self-propelling machines. Ten Pneumelectric 250-volt machines.—Reading Iron Co., Kimmelton, Pa.

PUMPS

High head. General service and boiler feed.—NEW RIVER.

RAILS

New and second-hand, all sections on hand for immediate shipment.—M. K. FRANK, Frick Bldg., Pittsburgh, Penn.

WANTED

One 3-ton, 250-volt mining locomotive, 36″ gage, outside wheels, side trolley pole connection, center bumper; one mile trolley wire with hangers; bonds for one-mile track.—W508—Coal Age.

ARE YOU SINKING A SHAFT?

If so, don't place your order for hoisting engines until you see what we offer for shafts up to 680 ft. deep, engines 22″ x 36″ up to 24″ x 48″. *Write for full list of equipment.*

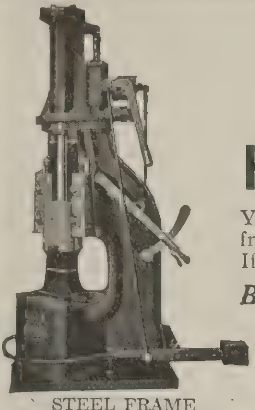
THE NEW RIVER COMPANY
Equipment Sales Department
MacDonald West Virginia

Orvis C. Hoffman **Leon H. Hoffman**

DIAMOND CORE DRILLING
—CONTRACTORS—
HOFFMAN BROS.
PUNXSUTAWNEY, PA.
(Our Specialty—Testing Bituminous Coal Lands)
Up-To-Date Equipments Expert Drill Runners Inquiries Solicited

HANS OLSON, Pres. JNO. A. FISHER, Sec'y.

Punxsutawney Drilling and Contracting Company
DIAMOND DRILL CONTRACTORS
Testing Bituminous Coal Lands a Specialty.
Weber Bldg. PUNXSUTAWNEY, PA.



STEEL FRAME
COMBINED TYPE

BELL
STEAM
HAMMERS

You can buy one out of a year's saving from even a single blacksmith's fire. If you write us we will tell you how.

Built in all types and sizes

Buffalo Foundry & Machine Co.
No. 8 Winchester Ave.
Buffalo, N. Y.
New York Office:
1432 Whitehall Bldg., 17 Battery Place

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4 Ft. Hole At One Setting

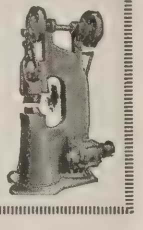
A quick adjustment and a 7 ft. hole with

The Scranton Rotary Drill
Scranton Electric Construction Co.
Scranton, Pa.

The **Little Giant Power Hammer,** (with or without individual motor drive), equipped with **Little Giant Combination Chisel Bit** and **Pick Point Dies,** will save many men and pay for itself several times each year.

Sold by your jobber, or from our factory, on 30 days' free trial.

MAYER BROS. CO., 102 Rock St., Mankato, Minn., U. S. A.



CHROMOLINE
TEMPERING COMPOUND

For Mine Machine Bits. Increases life of Bits, increases machine capacity, increases profits. One pound tempers 2000 bits. Investigate.

CROCKWELL MINE & MILL SUPPLY CO.
707 New Bank of Commerce Bldg. St. Louis, Mo.

DRILL BITS LIKE THIS—

Clean, uniform, effective, are made, by hammering, on the SULLIVAN SHARPENER

Bulletin 72 C.

Sullivan Mach'y Co.,
122 So. Michigan Ave., Chicago

When It's

Diamond Core Drilling

you want, write or wire us.

Birdsboro Steel Foundry & Machine Co.
Birdsboro, Pa.

THEW SHOVELS

Are made in seven sizes, with from ½ to 2-yard dipper capacity and for operation with steam, electricity, gasoline or compressed air. Write for Circular C and other interesting data.

THE THEW AUTOMATIC SHOVEL CO. LORAIN, OHIO

Marion
COAL STRIPPING SHOVELS

EXPERIENCED Coal Strippers often run into a piece of overburden a whole lot harder than their drilling showed. Such a condition cannot be foreseen, and can only be guarded against by providing shovel equipment that will stand up under emergency load.

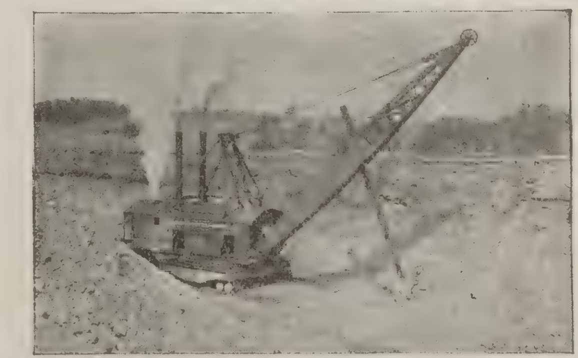
The illustration below shows just what we mean by "emergency load." The Witch Hazel Coal Company, Youngstown, Ohio, owners of this Marion, will tell you that

It's Easy to Dig Ordinary Dirt—But it Takes a Marion to "Make" Hard Shale and Limestone

This particular operation is near Piney Fork, Ohio—just a few miles from the Ohio River. The upper part of the overburden, as the illustration clearly indicates, is of hard shale and the bottom solid limestone. Material such as this furnishes a real test of steam shovel service, and we are proud of the performance of this Marion.

To meet just such conditions, to solve the many problems in the constantly widening field of surface coal mining has been our aim—and will be. What we have accomplished, and what we can accomplish, *for you* is interestingly told in our little booklet, "Stripping Coal with Economy and Speed." Glad to send it to you if you ask for Catalog 91-L.

THE MARION STEAM SHOVEL COMPANY
Established 1884
Manufacturers of Excavating Machinery of Every Description
Station L, MARION, OHIO
ATLANTA CHICAGO NEW YORK SAN FRANCISCO SEATTLE



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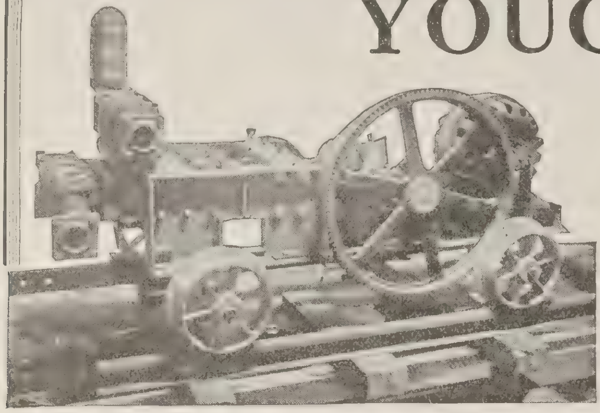


YOUGH Has All the Qualities the Mine Superintendent Wants

Because these Triplex Single Acting Portable Electric Driven Mine Pumps are **practically** built. For instance the **Water End is sectional,** instead of one-piece, eliminating the necessity of throwing the pump away when repairs are made. Built especially for dip heading and sump work, taking up little head room. But why not get all the points? Our latest bulletin gives them. **Send for it now.**

BOYTS, PORTER & CO.
Connellsville, Pa.

GOULDS PUMPS
FOR EVERY SERVICE
THE GOULDS MANUFACTURING CO. SENECA FALLS, N.Y.

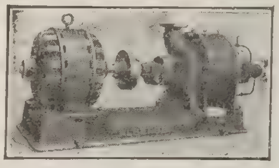
THE JOHN H. McGOWAN CO.
BUILDERS
McG PUMPING MACHINERY McG
IN ALL TYPES FOR ALL USES
CINCINNATI OHIO

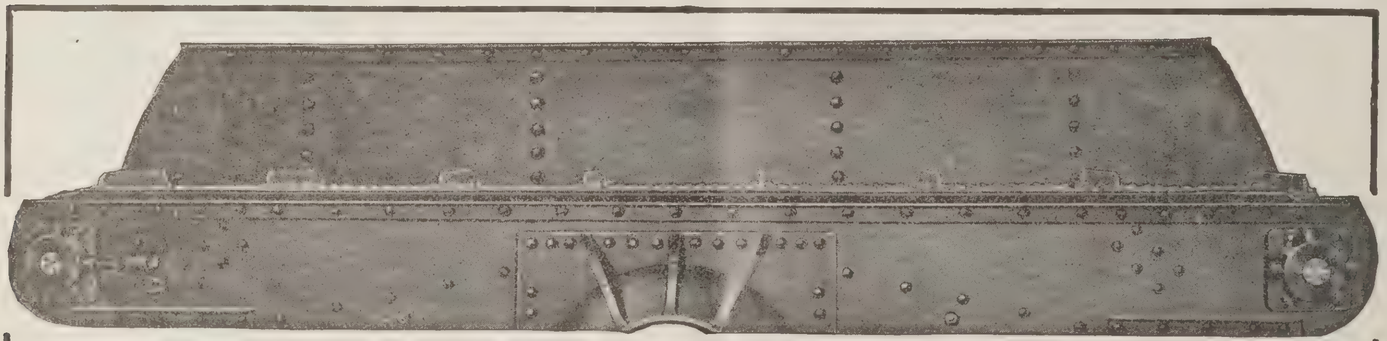
ALBERGER
MINE PUMPS

With Centrifugal Pumps, whether of the Turbine or Volute Type, the name of Alberger is a guarantee of maximum service and minimum operating expense.

Write for Bulletins.

Alberger Pump & Condenser Company, 140 Cedar St., New York
Atlanta Boston Chicago St. Louis Pittsburgh San Francisco New Orleans





Our **Superior Loader** carries coal full length of this long reversible conveyer, gives perfectly loaded product, is durable and has large capacity.

CHRISTY BOX CAR LOADER CO.
DES MOINES, IOWA

SKF
Ball Bearings
Double Row—Self-Aligning
S K F BALL BEARING CO.
50 Church Street, New York

Let Us Improve Your Haulage System

by a thorough study of your particular requirements by our expert engineering staff, who will gladly cooperate with you in the selection of the **right**

TRACK EQUIPMENT

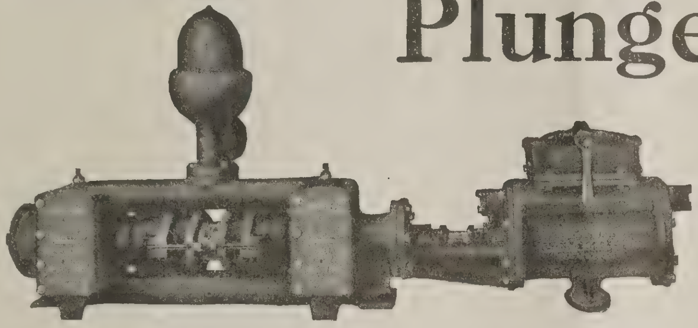
for your mine. Our unsurpassed facilities enable us to fill your order promptly. **Write for our interesting catalog today.**

The
CINCINNATI FROG & SWITCH COMPANY
MANUFACTURERS OF
TRACK EQUIPMENT
FOR STEAM AND ELECTRIC RAILROADS
MINES AND MILLS
CINCINNATI

The Slogan of the Cameron—"Character: The Grandest Thing"

Withstands the Wear of Gritty Water
Readily Accessible—Simple—Durable

Cameron Outside Packed Plunger Pump



Cameron Pump have stood the most severe tests, working successfully under the hardest conditions. You will find they'll give you splendid service.

More durable than a piston pump—the water-end has no wearing parts except the packing in the stuffing boxes which can be instantly adjusted from the outside. There are no rods, arms or working parts exposed to rust or damage. The plunger is supported in stuffing boxes and cannot sag or get out of line at the end of the stroke.

Many types of Cameron Pumps are described in Bulletin No. 104. *It's free*

A. S. Cameron Steam Pump Works

11 Broadway, NEW YORK 1225 Offices the World Over

SOUTHWARK
Centrifugal Pumps

You might as well take advantage of the low initial cost of Southwark Centrifugal Pumps, especially when their efficiency is higher than any high-priced pumps.

Write for Bulletin CA

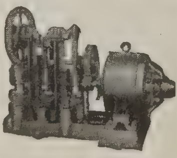
Southwark Foundry & Machine Co.
Home Office and Works, Philadelphia, Pa.
1328 Broadway, New York. Frick Bldg., Pittsburgh. Old Colony Bldg., Chicago. Brown-Marx Bldg., Birmingham.

PLATT
MAKERS OF
PLATT CENTRIFUGAL AND TURBINE PUMPS
Single and Multi-Stage
SMITH-VAILE STEAM AND POWER PUMPING MACHINERY
STILWELL FEED WATER HEATERS AND PURIFIERS
SMITH-VAILE FILTER PRESSES AND OIL MILL EQUIPMENT
VICTOR-FRANCIS TURBINE WATER, WHEELS
SMITH-VAILE AIR COMPRESSORS
Steam and Power Driven

PLATT PRODUCTS

are known wherever economy and efficiency are matters of first importance. That's why you will find so many coal mines equipped with

Smith-Vaile "Triplex" Pumps



Built in a great variety of sizes—**and built right.** Any lining you need to protect your pump from acid-bearing waters.

Write for Bulletins on Platt Products.

Platt Iron Works, Dayton, Ohio

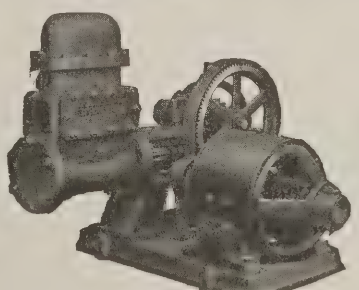
Branch Offices in All Principal Cities

If You Strike a Water Pocket

A pump like this will cost little, but will do much. For the small price of this pump you can not afford to endanger your workings. When you strike a water pocket and one of your regular pumps gives out, *then what would you give for a reserve pump?* This

DEMING
"Ajax" Gathering Pump

is good for 150 ft. head and has a capacity of 75 gallons per minute. Gears are carefully guarded; valves are very accessible. Can be mounted on a mine car and taken instantly to the danger point. Write for details.



Large Stocks of Deming Mine Pumps Are Carried in Pittsburgh, Chicago and Denver.

The Deming Company, Salem, Ohio

General Distributing Houses:
Chicago: Henion & Hubbell.
Pittsburgh: Harris Pump & Supply Co.
Denver: Hendrie & Bolthoff Mfg. & Supply Co.

The Open Cap Truck

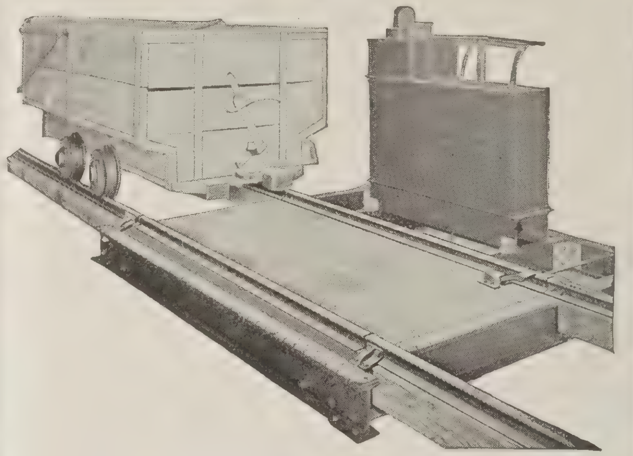
(Guaranteed)

IN this Truck are combined all the essentials that go to make up a first-class Mine Car Truck. It can be lubricated with either grease or oil with long service from each lubrication—is thoroughly dustproof—runs with very little friction—has a full-floating axle with visible linch pins which can be easily replaced, and is guaranteed against internal wear.

Selected by the Atlantic Refining Co. to demonstrate, at the American Mining Congress in Philadelphia, the highest development of a self-oiling wheel using their lubricant. We'll send you details.

Phillips Mine and Mill Supply Co.
Pittsburgh Penna.

Weigh Your Tipple Cars in Motion



The Streeter-Amet Weight Recorder

makes this method absolutely accurate.

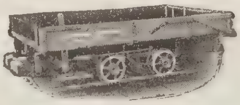
Eliminates the loss of time and money due to stopping each car on the scale.

Furnishes an absolute and indelible printed record of the weight of each car as it passes over the scale. Makes careless weighing impossible. Assures you that your tipple receives every ton of coal you pay for.

Your descriptive literature is now ready.

Streeter-Amet Weighing & Recording Co.
4101-05 Ravenswood Ave., Chicago, Ill.

"Automobile"



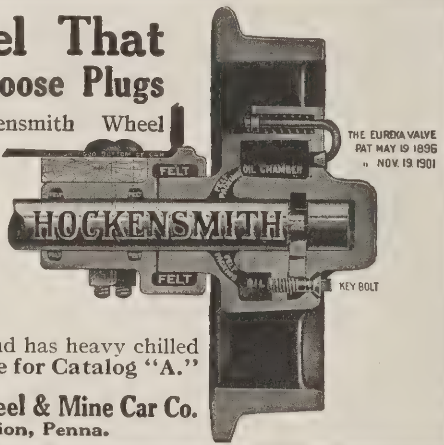
Mr Sanford-Day

Whitney Roller Bearing Wheels

"Trucks for cars now in use, or complete new cars will be furnished equipped with "Whitney" roller bearing wheels with the floating automobile type of axle. Your cars will then run from six to eighteen months one greasing. They will coast on a grade of one half of one per cent. By actual test in 20 car trips 58% of the electric haulage power is saved while doubling the speed of haulage. Used in a thousand mines, this Pioneer roller bearing wheel hasn't had a single worn out roller reported in the past seven years. It is absolutely fool proof and requires no attention. It has no cotters, gaskets, packing, key blocks, washers, or other parts requiring renewal. It will outlast two wheels of any other design or make. All wearing parts covered by written guarantee. Largest coal mines using them. Get our 160-page loose-leaf catalog No. 25 of wheels, cars, sheaves, dumps, tipples, switches and other mine equipment."

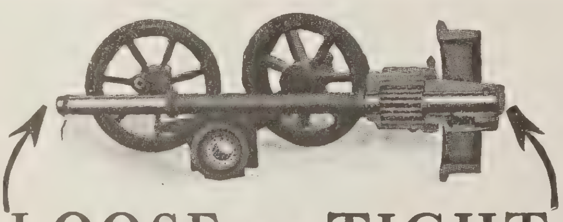
Sanford-Day Iron Co.
Knoxville, Tenn.
See Big Ad. Dec. 4

A Wheel That
Eliminates Loose Plugs



This new Hockensmith Wheel has solid closed Hub and Spring Valve Oiler. Note the straight spokes conforming to our usual high quality product. Wheel is thoroughly annealed and has heavy chilled tread. **Write for Catalog "A."**

Hockensmith Wheel & Mine Car Co.
Penn Station, Penna.



LOOSE or TIGHT

Why choose? Use both and derive the advantages of both with none of the disadvantages of either. Equip with Lobdell Tight and Loose Wheel Equipment with either Iron, Brass or "Hyatt" Bearings.

Full particulars on request

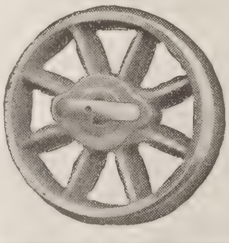
Lobdell Car Wheel Co., Wilmington, Del.

A Different Wheel

Here's a wheel that's easy to oil—that holds a large amount of oil—that is easily put on and taken off.

A wheel that gives real service.

Irwin Mine Car Wheel

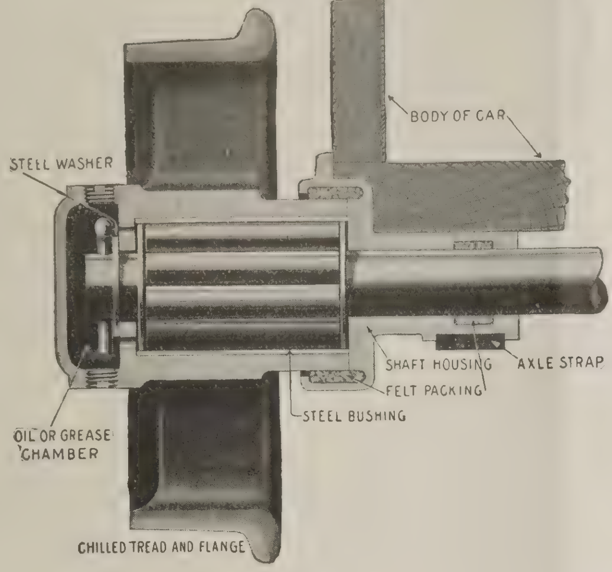


In this wheel the oil hole is located on center, the oil chamber is large. Features that mean ease of oiling and long time running on one oiling. The linch pin is always accessible—No trouble to remove wheel.

This wheel means smaller maintenance costs—better service. GET DETAILS TODAY.

Irwin Foundry & Mine Car Co.
Irwin, Pa.

"Ottumwa" Roller Bearing Car Wheels

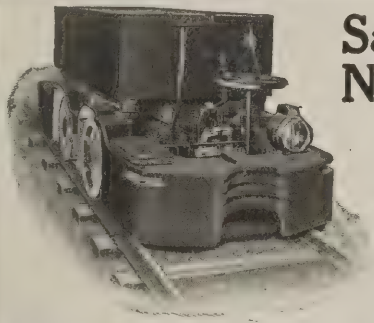


"Ottumwa" Roller Bearing Car Wheels represent the highest efficiency in modern car wheel development. They are so designed, and the iron is of such chemical analysis, that wheel breakage is almost unknown. Every wheel is fully guaranteed.

Cars equipped with the "Ottumwa" Roller Bearing Wheels will take 50% less power to pull them on a level track than is required for the ordinary style self-oiling wheels. They will require oiling only once or twice a year (no other attention is necessary) so that you save your oil bill, also the oiler's time.

Let us quote you on your next requirements. When ordering, give wheel diameter, track gauge and wheel base (distance from center to center of axle); also give the weight of the car and material.

OTTUMWA IRON WORKS, Inc., Ottumwa, Iowa



Save $2,000 Next Year

How? By sending your mules out to work on hillside farms and equipping your mine—above and below ground with

The Storage Battery Mule

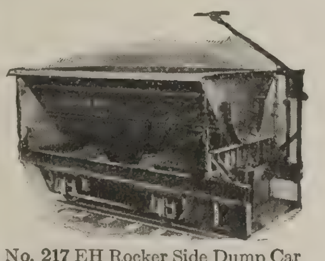
Every one you buy may save $2,000 a year. No need for bonding rails or trolleys. Take our "Mule" to the working level and put it on the job. Its self-contained power will take it anywhere in your mine. That's all.

More details? We'll be glad to send them.

Storage Battery Locomotive Co., 1942 Railway Exchange Bldg., St. Louis, Mo.

Coal Haulage Made Economical

Our engineers will tell you how, without obligation.



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ATLAS
Cars and Electric Locomotives
are distinctly superior in every detail. Built to meet your exact requirements.

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The Atlas Car & Mfg. Co.
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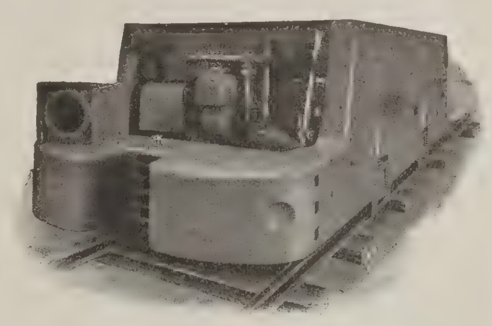

The Safe Gasoline Mine Motor —The Whitcomb

Whitcomb Gasoline Mine Motors are built so that no gasoline need ever be brought into the mine except in the heavy sheet-steel storage tanks provided with the motor. Any mine which lives up to the law provides enough ventilation to handle the exhaust so that there can be no objection to it.

Since Whitcomb Motors **can't** harm your mine and since they **will** save you money on your coal handling—

Why not go into the matter thoroughly? Write us for full details.

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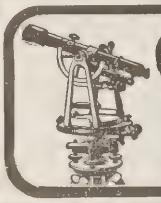

BUFF Mining Transits And Levels

The "Buff" is the result of 50 years of instrument study by our Mr. Geo. L. Buff—our present manager.

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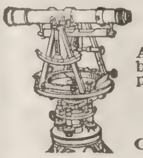

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are back of the forty-three years' success of
H. & B. Transits

All graduations are upon inlaid, solid sheet silver; every bearing is bronze against hard bell metal; all instruments are protected by complete sets of dust and rain guards.

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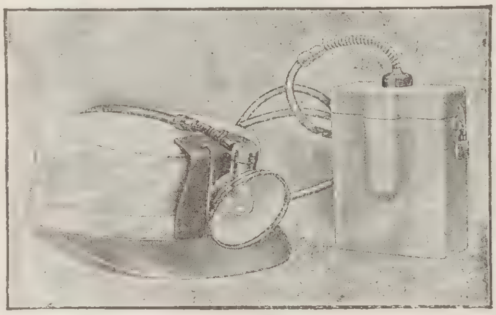
Wico Safety Electric Mine Lamp
Practically Indestructible



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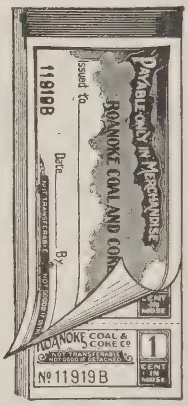

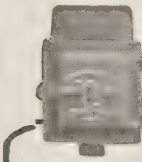

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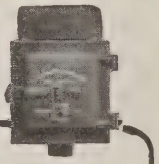
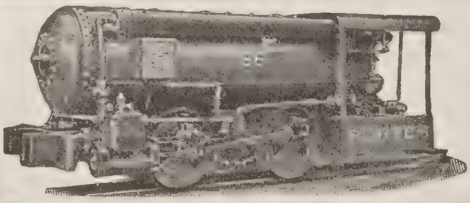
An unfailing system that puts every man in your mine within reach of your voice.
Write for Bulletin 2600.
STROMBERG-CARLSON TELEPHONE MFG. CO. ROCHESTER, N. Y. CHICAGO, ILL.





Specialist Mine Locomotive

That means—built in a plant where nothing but locomotives are made. That's why PORTERS are best.

H. K. Porter Co.
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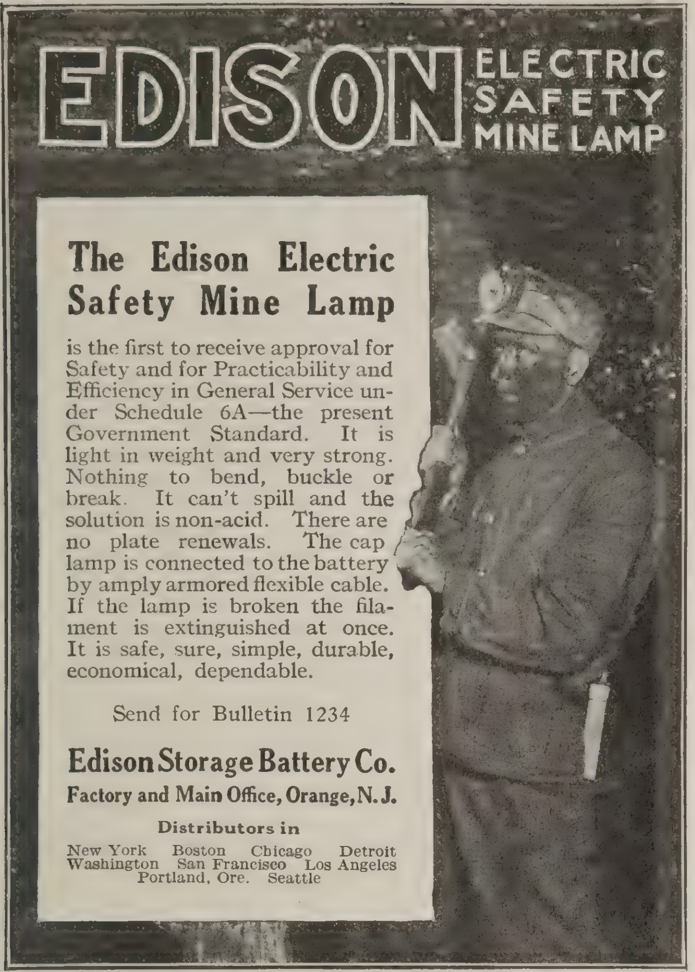
Pittsburgh, Pa.

RAILS FOR COAL MINES
Standard Sections, All Sizes.
Your Inquiries Solicited.
SWEET'S STEEL COMPANY
Williamsport, Pa.



EDISON ELECTRIC SAFETY MINE LAMP

The Edison Electric Safety Mine Lamp

is the first to receive approval for Safety and for Practicability and Efficiency in General Service under Schedule 6A—the present Government Standard. It is light in weight and very strong. Nothing to bend, buckle or break. It can't spill and the solution is non-acid. There are no plate renewals. The cap lamp is connected to the battery by amply armored flexible cable. If the lamp is broken the filament is extinguished at once. It is safe, sure, simple, durable, economical, dependable.

Send for Bulletin 1234

Edison Storage Battery Co.
Factory and Main Office, Orange, N. J.

Distributors in
New York Boston Chicago Detroit
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Valuable Information For Your Coal Mine

Every mine manager, superintendent and foreman should read this little booklet on Insulation. A careful perusal of its contents may lead to a longer life for your mine cables and electric machinery.

P & B Insulating Tape

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Write for this interesting Booklet now.

The Standard Paint Co.
Woolworth Building
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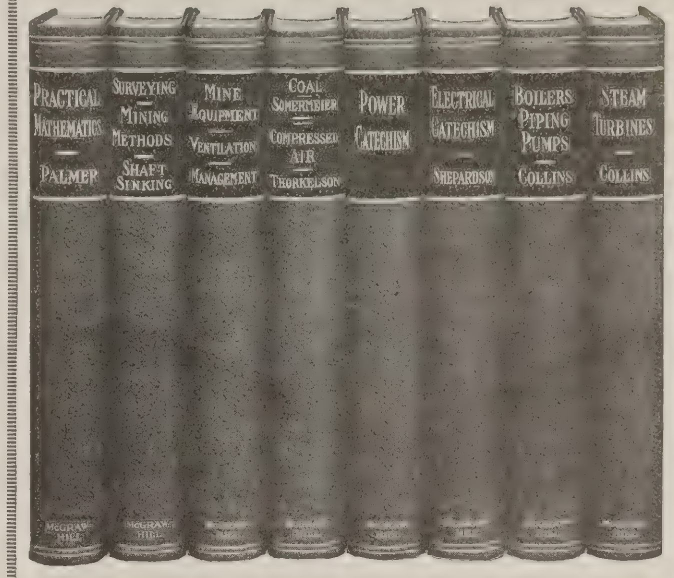

"This handy grouping of interesting information bearing on coal-mining plant operation will be of interest to every mining man.* * *

"From the earliest days we have taken geology as the fundamental study of mining and harrowed our minds with all the freakish developments of a plant out of gear. But it is refreshing to see a book which realizes that the mine is a machine shop and not a classroom for field geology. The books mark an era—the passing of the mining man who regarded himself as a brother to the civil engineer and his replacement by one who looks at coal mining largely as a mechanical problem.

Chief Study in Mining is Machine Operation

"In fact it is time for mine managers to put aside the misconceptions fostered by early association and training and to treat the mining problem as a study of mining and not of coal hunting, surveying and mine gases, though these subjects have their value. But there is nothing so likely to keep us back in development as to have too large a stress laid in our training on the less essential elements."

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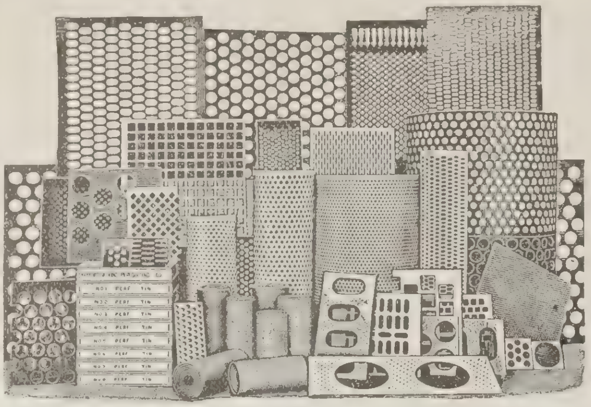

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For Coal and Coke, Crushed Stone, Phosphate Rock, Gravel, Sand, etc.

¶ Cylindrical Screen sections rolled to diameter lap or butt joints, and fastened with clips, bolted or riveted —segments for Taper Screens rolled to diameter with bolt holes in margins.

¶ Flat screen plates of any dimensions to 10x20 feet to one inch thick for heavy work.

¶ Standard sizes of Round, Oblong and Square holes—special sizes made to suit.

¶ Manganese Bronze or Monel Metal screens for acidulated or sulphurous mine waters.

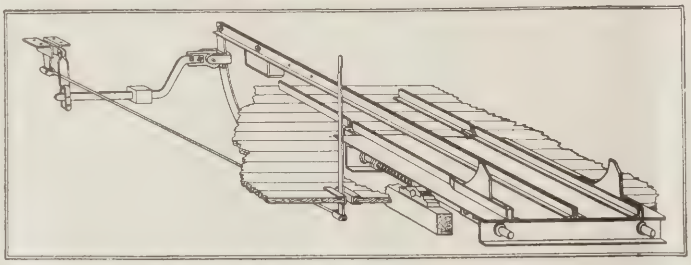
OUR sizes are standard centers (distance apart) but we can give you closer or wider spacing if required—in other words *you get what you want.*

The screens are made with care, exact to details of size, thickness and dimensions—in point of material and workmanship the best of their kind.

Please send detail specifications with your order or inquiry.

THE HARRINGTON & KING PERFORATING CO.
628 North Union Ave., CHICACO, ILL.
New York Office: 114 Liberty Street

You Can Dump Your Cars Rapidly



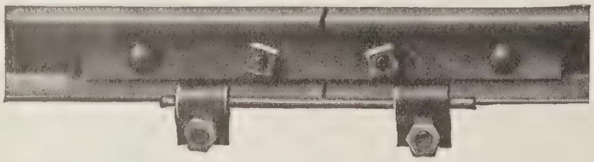
if your system includes

Ridge Spring Kick Back Dumps

A remarkable time-saving device that automatically pushes the dumped car back on the empty track with little effort on the part of the operator. Spring actuated. Makes it easy to dump the heaviest mine cars.

Very sturdy in construction. A necessity for the modern mine. **Write us for full particulars today.**

The Mineral Ridge Manufacturing Company, Mineral Ridge, Ohio



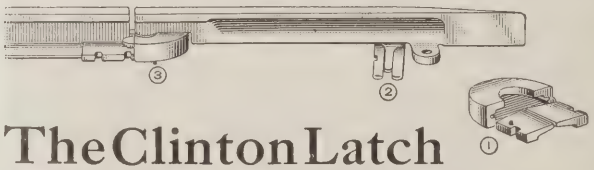
The ECONOMY Rail Bond

will end excessive rail drop in your mine by providing a highly efficient means of increasing the conductivity of the joints without the necessity of welding or soldering.

Gives over 6 square inches of copper to steel contact and may be attached and detached by unskilled labor. Used in many of the largest coal mines in the country.

May we send you full facts? Write for Bulletin now.

The Economy Rail Bond Co., Huntsville, Mo.



The Clinton Latch

A Good Latch, and we are ready to *prove* it. We first proved it to the General Manager of a western coal company, whose electric mine was suffering from track trouble. He ordered his men to get *good* latches—the kind that would stand up under his heavy haulage. They could not be found, **so the Clinton Latch was made**—so strong, so simple, so *good* that you cannot afford to be without it, even if your haulage isn't the heaviest. The Clinton Latch will save you money. **Ask us about it.**

Clinton Switch Company, CLINTON, IND.

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Beams, Channels, Angles, Etc.
Carnegie Steel Co., Pittsburgh, Penn. Export Representatives: United States Steel Products Co., New York, N. Y.

Bearings, Ball and Roller
Hess-Bright Mfg. Co., Front St. and Erie Ave., Philadelphia, Pa. Cable Address: "Hessbright." Manufacturers and distributors of Hess-Bright (HB-DWF) ball bearings. Hess-Bright ball bearings have continuous and uninterrupted raceways for the travel of the balls; they are self-aligning to the extent that they are applicable to all properly constructed machinery and shafting, but not to the extent of interfering with great radial and end thrust load capacities. Sizes and capacities, as well as list prices, cheerfully furnished upon application.
Irwin Fdry. & Mine Car Co., Irwin, Penn.
S K F Ball Bearing Co., 50 Church St., N. Y. C. Cable Address: "Skayef," New York.
All commercial sizes; capacities given by tables in catalog.
"S K F" are Swedish steel ball bearings, made at Gothenburg, Sweden. They are self-aligning bearings, permitting the shaft upon which they are mounted to deflect without binding the bearings. These bearings have a double-row construction, two rows of balls to each bearing, the balls being held in staggered relation in the raceways.
Sanford-Day Iron Works, Knoxville, Tenn.

Belt Dressing
Keystone Lubricating Co., Philadelphia, Penn.

Belts, Transmission
Gandy Belting Co., 734 W. Pratt St., Baltimore, Md. Branch Office: 36 Warren St., New York.
Link-Belt Co., Chicago, Ill.
Webster Mfg. Co., Tiffin, Ohio.

Bins, Coal and Coke
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.
Link-Belt Co., Chicago, Ill.

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Mayer Bros. Co., Mankato, Minn.
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Sullivan Machinery Co., Chicago, Ill.

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Crockwell Mine & Mill Supply Co., 707 New Bank of Commerce Bldg., St. Louis, Mo.
Pittsburgh Knife & Forge Co., Pittsburgh, Penn.

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General Electric Co., Schenectady, N. Y.
Ridgway Dynamo & Engine Co., Ridgway, Penn.
Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa.

Boilers
Freeman & Sons Mfg. Co., S., Racine, Wis. Branch Office: Chicago, Ill. Agencies in principal cities.

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Allison Coupon Co., Indianapolis, Ind.

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McGraw-Hill Book Co., 239 W. 39th St., N. Y. C.

Boosters
General Electric Co., Schenectady, N. Y.
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Fairmont Mining Machinery Co., Fairmont, W. Va.
Rotary type for all fine materials.
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Link-Belt Co., Chicago, Ill.
Vulcan Iron Works, Wilkes-Barre, Penn.
Wilmot Engineering Co., Hazleton, Penn.

Briquetting Machinery
Malcolmson Briquet Engr. Co., Chicago, Ill.
Mashek Engr. Co., 90 West St., New York.

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Gifford-Wood Co., Hudson, N. Y.
Hendrick Mfg. Co., Carbondale, Penn.
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.
Link-Belt Co., Chicago, Ill.
Webster Mfg. Co., Tiffin, Ohio.

Cableways
Flory Mfg. Co., S., Bangor, Penn.

Cages
Link-Belt Co., Chicago, Ill.
Ottumwa Iron Works, Ottumwa, Iowa.
Phillips Mine & Mill Supply Co., Pittsburgh, Pa.
Scottdale Machine & Mfg. Co., Scottdale, Penn.

Car Hauls
Fairmont Mining Machinery Co., Fairmont, W. Va.
Up or down hauls—chain or cable.
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.
Link-Belt Co., Chicago, Ill.
Webster Mfg. Co., Tiffin, Ohio.

Car Hitchings
Irwin Foundry & Mine Car Co., Irwin, Penn.
Pittsburgh Knife & Forge Co., Pittsburgh, Penn.

Car Loaders
Christy Box Car Loader Co., Des Moines, Iowa.
Link-Belt Co., Chicago, Ill.
Webster Mfg. Co., Tiffin, Ohio.

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Atlas Car & Mfg. Co., Ivanhoe Road, Dept. O, Cleveland, Ohio.
Fairmont Mining Machinery Co., Fairmont, W. Va.
Hockensmith Mine Car Co., Penn Station, Penn.
Irwin Foundry & Mine Car Co., Irwin, Penn.
Lobdell Car Wheel Co., Wilmington, Del.
"Lobdell" high carbon heat treated solid steel locomotive wheels.
Ottumwa Iron Works, Ottumwa, Iowa.
Phillips Mine & Mill Supply Co., Pittsburgh, Pa.
Sanford-Day Iron Works, Knoxville, Tenn.
Stine Co., J. C., Tyrone, Penn.
Stine, S. B., Box H, Osceola Mills, Penn.

Cars, Steel Mining
Hendrick Mfg. Co., Carbondale, Penn.
Sanford-Day Iron Works, Knoxville, Tenn.

Castings
Boyts, Porter & Co., Connellsville, Penn.
Buffalo Fdry. & Mach. Co., Buffalo, N. Y.
Covington Machine Co., 84 Wall St., New York.
Fairmont Mining Machinery Co., Fairmont, W. Va.
Hockensmith Mine Car Co., Penn Station, Penn.
Irwin Foundry & Mine Car Co., Irwin, Penn.
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.
Link-Belt Co., Chicago, Ill.
Lobdell Car Wheel Co., Wilmington, Del.
Chilled iron for jaw plates, rolls and other crusher parts. Sprockets, sheave wheels.
Sanford-Day Iron Works, Knoxville, Tenn.
Stine Co., J. C., Tyrone, Penn.
Webster Mfg. Co., Tiffin, Ohio.

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Smooth-On Mfg. Co., Jersey City, N. J.
In 1-, 5-, 10- and 25-lb. cans.
"Smooth-On" iron cements, metallize ,and become part of metal to which applied.

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Link-Belt Co., Chicago, Ill.
Phillips Mine & Mill Supply Co., Pittsburgh, Pa.
Sanford-Day Iron Works, Knoxville, Tenn.
Scottdale Machine & Mfg. Co., Scottdale, Penn.
Webster Mfg. Co., Tiffin, Ohio.

Chutes, Box Car Loading
Hendrick Mfg. Co., Carbondale, Penn.

Coal Cleaners
Pennsylvania Crusher Co., Philadelphia, Penn.

Coal Dock Bridges
Link-Belt Co., Chicago, Ill.
Roberts & Schaefer Co., Chicago, Ill.

Coal Mining Plants
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.
Malcolmson Briquet Engr. Co., Chicago, Ill.
Roberts & Schaefer Co., Chicago, Ill.

Coal Storage and Rehandling Machinery
Christy Box Car Loader Co., Des Moines, Iowa.
Gifford-Wood Co., Hudson, N. Y.
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.
Link-Belt Co., Chicago, Ill.
Phillips Mine & Mill Supply Co., Pittsburgh, Pa.
Roberts & Schaefer Co., Chicago, Ill.
Webster Mfg. Co., Tiffin, Ohio.

Coke Oven Drawing and Leveling Machines
Covington Machine Co., 84 Wall St., N. Y. City.
Sizes to meet requirements; capacity, 4 to 6 ovens per hr. For "Beehive" ovens.

Coke Ovens
Link-Belt Co., Chicago, Ill.
Scottdale Machine & Mfg. Co., Scottdale, Penn.

Compressors, Air
Chicago Pneumatic Tool Co., 1032 Fisher Bldg., Chicago, Ill.
Fuel oil, gas, steam power driven.
General Electric Co., Schenectady, N. Y.
Goulds Mfg. Co., Seneca Falls, N. Y.
Ingersoll-Rand Co., 11 Broadway, New York City.
Branches: Boston, Birmingham, Butte, Cleveland, Chicago, Denver, Duluth, El Paso, Knoxville, Los Angeles, Philadelphia, Pittsburgh, St. Louis, Seattle.
'Imperial,' 'Ingersoll-Rogler,' 'Turbo.' All sizes. Portable elec. driven mine car outfits.
Southwark Foundry & Machine Co., Phila., Pa.
Sullivan Machinery Co., Chicago, Ill.
Steam, belt and motor driven; portable motor driven units for use underground.

Concrete Reinforcement
Carnegie Steel Co., Pittsburgh, Penn. Export Representatives: United States Steel Products Co., New York, N. Y.

Condensers
Alberger Pump & Condenser Co., New York City.
Cameron Steam Pump Works, A. S., N. Y. City.
Ingersoll-Rand Co., 11 Broadway, New York City.
Southwark Foundry & Machine Co., Phila., Pa.
Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa.

Consulting Engineers (See Alphabetical Index)

Controllers
General Electric Co., Schenectady, N. Y.
Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa.

Converters, Rotary, Electric
Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa.

Conveyors, Belt
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.
Link-Belt Co., Chicago, Ill.
Webster Mfg. Co., Tiffin, Ohio.

Conveyors, Cable Flight
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.
Webster Mfg. Co., Tiffin, Ohio.

Conveyors, Chain Flight
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.
Link-Belt Co., Chicago, Ill.
Webster Mfg. Co., Tiffin, Ohio.
Wilmot Engineering Co., Hazleton, Penn.

Conveyors, Coal
Fairmont Mining Machinery Co., Fairmont, W. Va.
All types to meet any conditions.

Gifford-Wood Co., Hudson, N. Y.
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.

Conveyors, Pan or Apron
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.
Webster Mfg. Co., Tiffin, Ohio.

Conveyors, Screw
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.
Link-Belt Co., Chicago, Ill.
Webster Mfg. Co., Tiffin, Ohio.

Conveyors, Trough
Hendrick Mfg. Co., Carbondale, Penn.
Webster Mfg. Co., Tiffin, Ohio.

Cooling Towers
Alberger Pump & Condenser Co., New York City.

Couplings
Fairmont Mining Machinery Co., Fairmont, W. Va.
Hockensmith Mine Car Co., Penn Station, Penn.

Coupon Books
Allison Coupon Co., Indianapolis, Ind.
For commissary stores; samples on request.

Cranes
Link-Belt Co., Chicago, Ill.

Crossings (See Switches, Frogs and Crossings)

Crushers, Coal
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.
Link-Belt Co., Chicago, Ill.
Pennsylvania Crusher Co., Philadelphia, Penn.
Scottdale Machine & Mfg. Co., Scottdale, Penn.
Webster Mfg. Co., Tiffin, Ohio.
Williams Patent Crusher & Pulverizer Co., Old Colony Bldg., Chicago, Ill.

Crushing Plants, Coke
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.
Link-Belt Co., Chicago, Ill.
Scottdale Machine & Mfg. Co., Scottdale, Penn.
Webster Mfg. Co., Tiffin, Ohio.
Williams Patent Crusher & Pulverizer Co., Old Colony Bldg., Chicago, Ill.

Cut-Outs, Electrical
Flood City Mfg. Co., Johnstown, Penn.

Diamond Core Drill Contracting
Birdsboro Steel Fdry. & Mach. Co., Birdsboro, Pa.
Hoffman Bros., Punxsutawney, Penn.
Punxsutawney Drilling & Contracting Co., Punxsutawney, Penn.
Sullivan Machinery Co., Chicago, Ill.

Diamonds for Core Drills
Byron & Hall, 116 Broad St., New York.

Dock Hoists
Flory Mfg. Co., S., Bangor, Penn.

Doors, Automatic Mine
(See Mine Doors, Automatic)

Drafting Materials
(See Eng. Instruments and Supplies)

Dredging Machinery
Marion Steam Shovel Co., Sta. K, Marion, Ohio.
Thew Automatic Shovel Co., Lorain, Ohio.

Drills, Air
Ingersoll-Rand Co., 11 Broadway, New York City.
Jackhamer for boring coal, shaft sinking, ditching, etc. Leyner-Ingersoll for development work.
Sullivan Machinery Co., Chicago, Ill.
Hammer drills and rock drills, all styles.
Whitcomb Co., Geo. D., Rochelle, Ill.

Drills, Core
Ingersoll-Rand Co., 11 Broadway, New York City.
"Calyx"—Cores 1½-18⅝"; depths to 4,000 ft.
Sullivan Machinery Co., Chicago, Ill.

Drills, Electric
Ingersoll-Rand Co., 11 Broadway, New York City.
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.
Scranton Electric Construction Co., Scranton, Pa.

Drills, Hammer
Chicago Pneumatic Tool Co., Chicago, Ill.

Drills, Power
Fairmont Mining Machinery Co., Fairmont, W. Va.
For mounting on all types of under-cutting machines; gear or chain drive from machine motor.

Drives, Silent Chain (See Chain, Silent)

Dumps, Cross-Over
Fairmont Mining Machinery Co., Fairmont, W. Va.
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.
Link-Belt Co., Chicago, Ill.
Phillips Mine & Mill Supply Co., Pittsburgh, Pa.
Sanford-Day Iron Works, Knoxville, Tenn.
Sullivan Machinery Co., Chicago, Ill.

Dynamite and High Explosives
Aetna Explosives Co., 2 Rector St., N. Y. City.

Dynamos (See Generators)

Elevators
Gifford-Wood Co., Hudson, N. Y.
Webster Mfg. Co., Tiffin, Ohio.

Engineering and Technical Books
McGraw-Hill Book Co., 239 W. 39th St., N. Y. C.

Engineering Instruments and Supplies
Buff & Buff Mfg. Co., Jamaica Plains Sta., Mass.
"Buff" transits and levels.
Heller & Brightly, Cor. Spring Garden St. and Ridge Ave., Philadelphia, Penn.

Engineers and Contractors
Malcolmson Briquet Engr. Co., Chicago, Ill.
Roberts & Schaefer Co., Chicago, Ill.

Engines, Gas and Gasoline
Webster Mfg. Co., Tiffin, Ohio.

Engines, Steam
Chuse Engine & Mfg. Co., Matoon, Ill.
Ridgway Dynamo & Engine Co., Ridgway, Penn.

Excavating Machinery
Marion Steam Shovel Co., Sta. K, Marion, Ohio.
Thew Automatic Shovel Co., Lorain, Ohio.

Card lists of Equipment are hard to keep, they won't correct themselves. this list will

Fans, Ventilating
American Blower Co., Detroit, Mich. Cable Address: "Ventilator, Detroit"; "Amblowco," New York. Branches: New York, Rochester, Philadelphia, Pittsburgh, Chicago, St. Louis, Atlanta, Minneapolis, Kansas City, Seattle, San Francisco, Los Angeles, Indianapolis, Boston, Columbus, Dallas, Grand Rapids.
General Electric Co., Schenectady, N. Y.
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.
Ottumwa Iron Works, Ottumwa, Iowa.
Stine Co., J. C., Tyrone, Penn.
Stine, S. B., Box H, Osceola Mills, Penn.
Sullivan Machinery Co., Chicago, Ill.
High speed, all steel, double inlet ventilators with reversible steel hood.
Vulcan Iron Works, Wilkes-Barre, Penn.
Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa.

Fittings, Wire Rope (See Rope, Wire)

Founders and Machinists
Buffalo Foundry & Mach. Co., Buffalo, N. Y.

Fuses, Electrical
Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa.

Gages, Water, Boiler and Locomotive
Lunkenheimer Co., Cincinnati, Ohio.

Gage Cocks
Lunkenheimer Co., Cincinnati, Ohio.

Gears
Falk Co., Milwaukee, Wis.
General Electric Co., Schenectady, N. Y.
Link-Belt Co., Chicago, Ill.
Webster Mfg. Co., Tiffin, Ohio.

Generators
Chuse Engine & Mfg. Co., Matoon, Ill.
General Electric Co., Schenectady, N. Y.
Ridgway Dynamo & Engine Co., Ridgway, Penn.
Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa.

Graphite, Lubricating, Boiler and Polishing
Dixon Crucible Co., Joseph, Jersey City, N. J.

Greases
Dixon Crucible Co., Joseph, Jersey City, N. J.
Keystone Lubricating Co., Philadelphia, Penn.
Sanford-Day Iron Works, Knoxville, Tenn.

Hammers, Pneumatic
Sullivan Machinery Co., Chicago, Ill.

Hammers, Steam
Buffalo Foundry & Mach. Co., Buffalo, N. Y.
Mayer Bros. Co., Mankato, Minn.
"Little Giant" power hammer with or without individual motor drive.

Hangers (See Pulleys)

Heaters, Feed Water
Alberger Pump & Condenser Co., New York City.

High Explosives (See Dynamite)

Hoists, Electric
Crawford & McCrimmon Co., Brazil, Ind.
Flory Mfg. Co., S., Bangor, Penn.
General Electric Co., Schenectady, N. Y.
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.
Ottumwa Iron Works, Ottumwa, Iowa.
All sizes from 5 to 1,500 hp.
Stine Co., J. C., Tyrone, Penn.
Vulcan Iron Works, Wilkes-Barre, Penn.

Hoists, Portable
Ingersoll-Rand Co., 11 Broadway, New York City.

Hoists, Steam
Flory Mfg. Co., S., Bangor, Penn.
Ottumwa Iron Works, Ottumwa, Iowa.
Both geared and first motion.
Stine, S. B., Box H, Osceola Mills, Penn.
Sullivan Machinery Co., Chicago, Ill.
Vulcan Iron Works, Wilkes-Barre, Penn.

Hydraulic Machinery
Southwark Foundry & Machine Co., Phila., Pa.

Igniters, Lamp
Koehler Mfg. Co., Marlboro, Mass. Sales Office: 541 Fourth Ave., Pittsburgh, Penn.
"Pyro" igniters fit all safety lamps. See Koehler Mfg. Co. under heading "Lamps, Safety."

Incline Plane Machines
Sanford-Day Iron Works, Knoxville, Tenn.
Stine Co., J. C., Tyrone, Penn.

Injectors and Ejectors
Lunkenheimer Co., Cincinnati, Ohio.

Insulating Material, Electric
Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa.

Insulators, Feeder Wire
Flood City Mfg. Co., Johnstown, Penn.

Insulators, Section
Flood City Mfg. Co., Johnstown, Penn.

Jigs
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.
Link-Belt Co., Chicago, Ill.
Webster Mfg. Co., Tiffin, Ohio.

Lamps, Acetylene
Milburn Co., Alex., Baltimore, Md.
Simmons Co., John, 110 Center St., New York.
"Baldwin" and "Zar" carbide lamps, cap and hand styles; from 3- to 12-hour capacity.

Lamps, Arc and Incandescent
General Electric Co., Schenectady, N. Y.
Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa.

Lamps, Electric
Edison Storage Battery Co., Orange, N. J.
Approved by Bureau of Mines under Schedule 6A.
General Electric Co., Schenectady, N. Y.
Westinghouse El. & Mfg. Co., E. Pittsburgh, Pa.
Witherbee Igniter Co., Springfield, Mass.

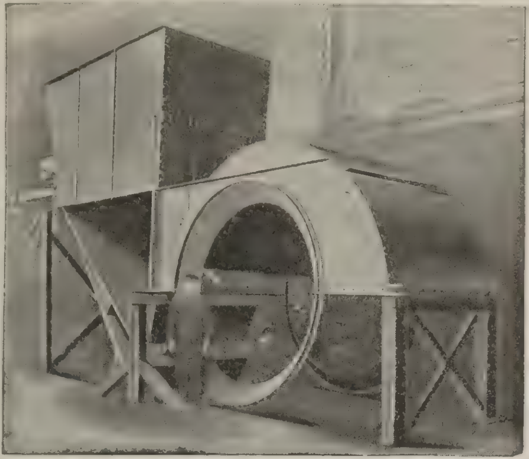
Lamps, Safety
Amer. Safety Lamp & Mine Sup. Co., Scranton, Pa.
Hughes Bros., 420 N. Main Ave., Scranton, Penn.
Koehler Mfg. Co., Marlboro, Mass.
Sales Office: 541 Fourth Ave., Pittsburgh, Penn. "Koehler" safety lamps are flame safety lamps approved by U. S. Bureau of Mines, approval No. 20. Gold medal awarded at San Francisco Exposition, 1915. Will burn 16 hours at a time; instantly relighted, if extinguished, by one twist of the "Pyro" igniter. Made in various sizes.
Wolf Safety Lamp Co., New York City.

Lamps, Safety Cap
Edison Storage Battery Co., Orange, N. J.
Electric; approved by Bureau of Mines.
Witherbee Igniter Co., Springfield, Mass.

Larries, Coke Oven
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.
Link-Belt Co., Chicago, Ill.
Phillips Mine & Mill Supply Co., Pittsburgh, Pa.
Watt Mining Car Wheel Co., Barnesville, Ohio.

Loaders, Box Car (See Box Car Loaders)

Loading Booms
Fairmont Mining Machinery Co., Fairmont. W. Va.
Equipped with special "Fairmont" power hoist:
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.
Webster Mfg. Co., Tiffin, Ohio.



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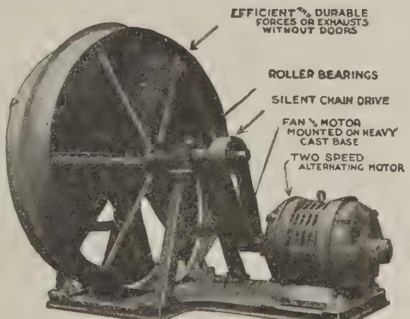

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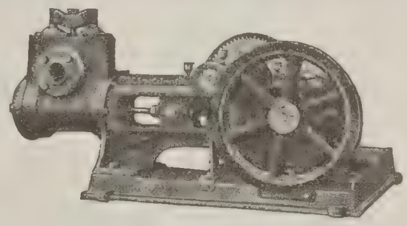

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Porter Co., H. K., 410 Wood St., Pittsburgh, Pa.
Vulcan Iron Works, Wilkes-Barre, Penn.

Locomotives, Electric
Atlas Car & Mfg. Co., Ivanhoe Road, Dept. O, Cleveland, Ohio.
Baldwin Locomotive Works, Philadelphia, Penn
Electric Carrier Co., 220 Broadway, New York.
General Electric Co., Schenectady, N. Y.
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.
Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa.

Locomotives, Gasoline
Vulcan Iron Works, Wilkes-Barre, Penn.
Whitcomb Co., Geo. D., Rochelle, Ill.

Locomotives, Steam
Baldwin Locomotive Works, Philadelphia, Penn.
Porter Co., H. K., 410 Wood St., Pittsburgh, Pa.
Vulcan Iron Works, Wilkes-Barre, Penn.

Locomotives, Storage Battery
Atlas Car & Mfg. Co., Ivanhoe Road, Dept. O, Cleveland, Ohio.
Edison Storage Battery Co., Orange, N. J.
General Electric Co., Schenectady, N. Y.
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.
Storage Battery Locomotive Co., 1942 Railway Exchange Bldg., St. Louis, Mo.
Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa.
Whitcomb Co., Geo. D., Rochelle, Ill.

Lubricants, Graphite
Dixon Crucible Co., Joseph, Jersey City, N. J.

Lubricators
Keystone Lubricating Co., Philadelphia, Penn.
Lunkenheimer Co., Cincinnati, Ohio.
Whitcomb Co., Geo. D., Rochelle, Ill.

Mechanical Draft Apparatus
American Blower Co., Detroit, Mich. Cable Address: "Ventilator, Detroit"; "Amblowco, New York." Branches: New York, Rochester, Philadelphia, Pittsburgh, Chicago, St. Louis, Atlanta, Minneapolis, Kansas City, Seatle, San Francisco, Los Angeles, Indianapolis, Boston, Columbus, Dallas, Grand Rapids.

Mine Doors, Automatic
American Mine Door Co., Canton, Ohio.

Miners' Lamps (See Lamps)

Mine Timbers, Steel
Carnegie Steel Co., Pittsburgh, Penn. Export Representatives: U. S. Steel Products Co., N. Y.

Mining Machines, Chain and Puncher
Ingersoll-Rand Co., 11 Broadway, New York City.
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.
Sullivan Machinery Co., Chicago, Ill.
Ironclad, Longwall and Room-and-Pillar.
Whitcomb Co., Geo. D., Rochelle, Ill.

Motors
General Electric Co., Schenectady, N. Y.
Goodman Mfg. Co., Chicago, Ill.
Ridgway Dynamo & Engine Co., Ridgway, Penn.
Stine Co., J. C. Tyrone, Penn.
Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa.

Oil and Grease Cups
Keystone Lubricating Co., Philadelphia, Penn.
Lunkenheimer Co., Cincinnati, Ohio.

Paints, Preservative
Dixon Crucible Co., Joseph, Jersey City, N. J.
Highland Chemical Products Co., Connellsville, Pa.
Standard Paint Co., Woolworth Bldg., New York.

Perforated Metals
Chicago Perforating Co., Chicago, Ill.
Cross Engineering Co., Carbondale, Penn.
Harrington & King Perforating Co., 628 North Union Ave., Chicago, Ill. Branch Office: 114 Liberty St., New York City.
Screens, flat and cylindrical, of steel, manganese bronze or "Monel" metal, with round, oblong or square holes, for satisfactorily screening and sizing coal, stone and ore.
Hendrick Mfg. Co., Carbondale, Penn.

Permissible Powders
Aetna Explosives Co., 2 Rector St., N. Y. City.

Picking Tables
Fairmont Mining Machinery Co., Fairmont, W. Va.
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.
Link-Belt Co., Chicago, Ill.
Roberts & Schaefer Co., Chicago, Ill.
Webster Mfg. Co., Tiffin, Ohio.

Piling, Steel Sheet
Carnegie Steel Co., Pittsburgh, Penn. Export Representatives: U. S. Steel Products Co., N. Y.
"United States" and "Friedstadt" steel sheet piling.

Pipe, Cast Iron
Hockensmith Mine Car Co., Penn Station, Penn.

Pipe Covering
Highland Chemical Products Co., Connellsville, Pa.
Standard Paint Co., Woolworth Bldg., New York.

Pipe, Wood Lined
Boyts, Porter & Co., Connellsville, Penn.

Powder, Blasting
Aetna Explosives Co., 2 Rector St., N. Y. City.

Power Transmission Machinery
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.
Link-Belt Co., Chicago, Ill.
Webster Mfg. Co., Tiffin, Ohio.

Pulleys, Shafting and Hangers
Hess-Bright Mfg. Co., Front St. and Erie Ave., Philadelphia, Penn.
Webster Mfg. Co., Tiffin, Ohio.

Pulverizers, Coal and Coke
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.

Pump Plungers
Lobdell Car Wheel Co., Wilmington, Del.
Chilled iron for boiler feed or any plunger pump.

Pumps, Air Driven
Boyts, Porter & Co., Connellsville, Penn.
Cameron Steam Pump Works, A. S., N. Y. City.

Pumps, Air Lift
Ingersoll-Rand Co., 11 Broadway, New York City.

Pumps, Boiler Feed
Boyts, Porter & Co., Connellsville, Penn.
Cameron Steam Pump Works, A. S., N. Y. City.
Goulds Mfg. Co., Seneca Falls, N. Y.
Platt Iron Works, Dayton, Ohio.

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Pumps, Centrifugal
Alberger Pump & Condenser Co., New York City.
Cameron Steam Pump Works, A. S., N. Y. City.
Goulds Mfg. Co., Seneca Falls, N. Y.
McGowan Co., J. H., Cincinnati, Ohio.
Morris Machine Works, Baldwinsville, N. Y.
Platt Iron Works, Dayton, Ohio.
Southwark Foundry & Machine Co., Phila., Pa.
Stine Co., J. C., Tyrone, Penn.
Stine, S. B., Box H, Osceola Mills, Penn.

Pumps, Power
Boyts, Porter & Co., Connellsville, Penn.
Cameron Steam Pump Works, A. S., N. Y. City.
Crawford & McCrimmon Co., Brazil, Ind.
Deming Co., The, Salem, Ohio. Cable Address: "Deming."
Capacities from 300 to 60,000 gal. per hour. Hand and power pumps for all uses and for all pumping conditions; portable and stationary types; vertical or horizontal; for operation by any power; gathering pumps, sump pumps, pumps for deep and shallow wells, etc.
Fairmont Mining Machinery Co., Fairmont, W. Va.
Portable electric for gathering purpose.
General Electric Co., Schenectady, N. Y.
Goulds Mfg. Co., Seneca Falls, N. Y.
McGowan Co., J. H., Cincinnati, Ohio.
Platt Iron Works, Dayton, Ohio.
Stine Co., J. C., Tyrone, Penn.

Pumps, Sinking
Boyts, Porter & Co., Connellsville, Penn.
Cameron Steam Pump Works, A. S., N. Y. City.

Pumps, Vacuum
Alberger Pump & Condenser Co., New York City.
Boyts, Porter & Co., Connellsville, Penn.
Buffalo Foundry & Mach. Co., Buffalo, N. Y.
Cameron Steam Pump Works, A. S., N. Y. City.
Goulds Mfg. Co., Seneca Falls, N. Y.
Ingersoll-Rand Co., 11 Broadway, New York City.

Purifiers, Feed Water
Scaife & Sons Co., Wm. B., Pittsburgh, Penn.

Rail Benders
Link-Belt Co., Chicago, Ill.

Rail Bonds
General Electric Co., Schenectady, N. Y.

Retarders, Railroad Car
Fairmont Mining Machinery Co., Fairmont, W. Va.
For controlling railroad cars under tipple.

Rope, Manila and Jute
Broderick & Bascom Rope Co., 809 N. Main St., St. Louis, Mo.
Waterbury Co., 80 South St., New York City.

Rope, Transmission
Broderick & Bascom Rope Co., 809 N. Main St., St. Louis, Mo.
Waterbury Co., 80 South St., New York City.
Webster Mfg. Co., Tiffin, Ohio.

Rope, Wire
Broderick & Bascom Rope Co., 809 N. Main St., St. Louis, Mo.
Waterbury Co., 80 South St., New York City.

Scales
Streeter-Amet Weighing & Recording Co., 4101-4105 Ravenswood Ave., Chicago, Ill.

Screens and Perforated Sheeting
Chicago Perforating Co., Chicago, Ill.
Harrington & King Perforating Co., 628 North Union Ave., Chicago, Ill. Branch Office: 114 Liberty St., New York City.
Screens, flat and cylindrical, of steel, manganese-bronze or "Monel" metal, with round, oblong or square holes, for satisfactorily screening and sizing coal, stone and ore.
Hendrick Mfg. Co., Carbondale, Penn.
Jeffrey Mfg. Co., 912 N. 4th St., Columbus, Ohio.
Link-Belt Co., Chicago, Ill.
Roberts & Schaefer Co., Chicago, Ill.
Scottdale Machine & Mfg. Co., Scottdale, Penn.
Webster Mfg. Co., Tiffin, Ohio.
Williams Patent Crusher & Pulverizer Co., Old Colony Bldg., Chicago, Ill.

Second-Hand Equipment (See Alphabetical Index for For Sale Ads.)

Shafting (See Pulleys, Shafting and Hangers)

Shearing Machines
Ingersoll-Rand Co., 11 Broadway, New York City.
"Radialaxe," air driven, column mounted.

Sheaves and Rollers
Link-Belt Co., Chicago, Ill.
Ottumwa Iron Works, Ottumwa, Iowa.
Sanford-Day Iron Works, Knoxville, Tenn.
Webster Mfg. Co., Tiffin, Ohio.

Shovels, Steam
Marion Steam Shovel Co., Sta. K, Marion, Ohio.
All sizes and types for stripping and mining coal.
Thew Automatic Shovel Co., Lorain, Ohio.

Signals, Mine
Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y.

Sprocket Wheels
Webster Mfg. Co., Tiffin, Ohio.

Steel, Drill
Ingersoll-Rand Co., 11 Broadway, New York City.

Stokers, Mechanical
Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa.

Storage Batteries
Edison Storage Battery Co., Orange, N. J.
Non-acid; made of steel; nickel and iron elements.
Storage Battery Locomotive Co., 1942 Railway Exchange Bldg., St. Louis, Mo.

Surveying Instruments (See Engineering Instruments and Supplies)

Switchboards, Power
General Electric Co., Schenectady, N. Y.
Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa.

Switchboards, Telephone
Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y.

Switches, Frogs and Crossings
Cincinnati Frog & Switch Co., Cincinnati, Ohio.
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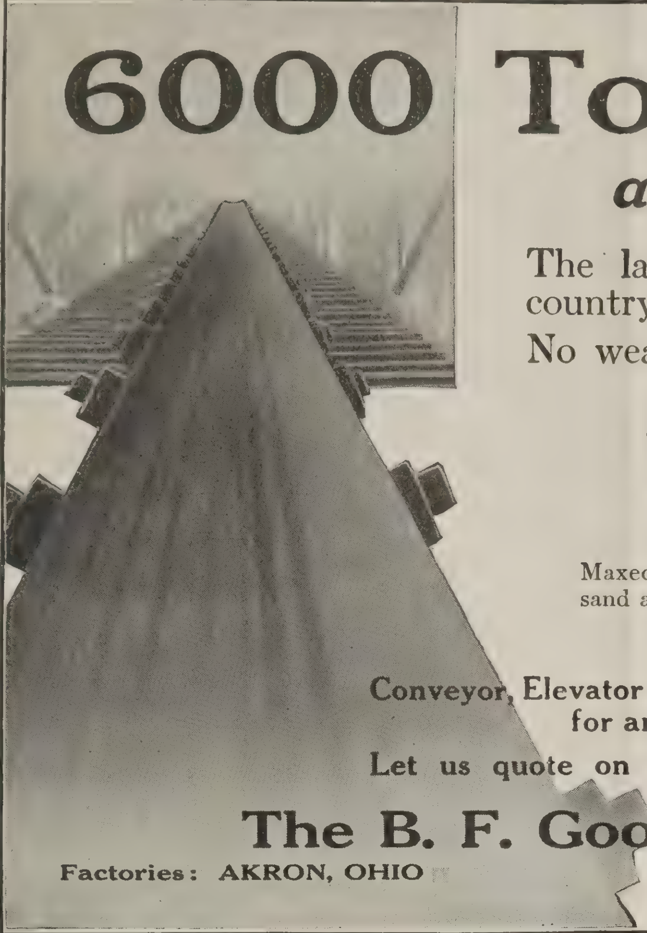
Tempering Compound
Crockwell Mine & Mill Supply Co., 707 New Bank of Commerce Bldg., St. Louis, Mo.



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Conveyor Belt

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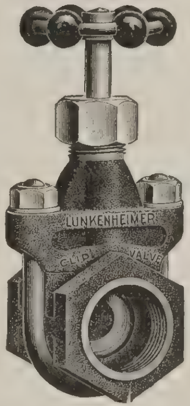

by more than twenty years of satisfactory service and a constantly increasing demand, proves its practicability.

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The steel "clip" which secures the hub to the body, adds strength and rigidity to the valve and facilitates taking apart for cleaning or repairs.

Has but few internal movable parts, viz.: stem and single, sharp-tapered, double-faced disc.

Indestructible joint between body and hub.

Made with Iron Body in sizes as small as ½-inch and has bronze inserted seats.

For handling cyanides and other acids which attack bronze, it is furnished in "all iron."

Material and workmanship of "Lunkenheimer Quality." Try them—you'll **adopt** them.

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Webster Mfg. Co., Tiffin, Ohio.

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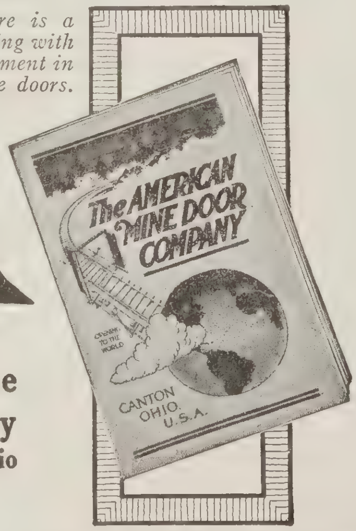
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CANTON OHIO U.S.A.

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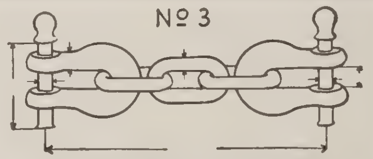

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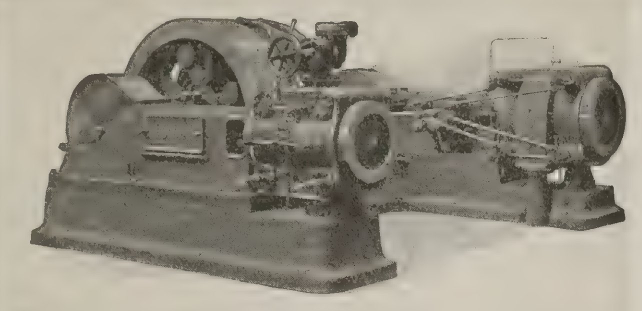

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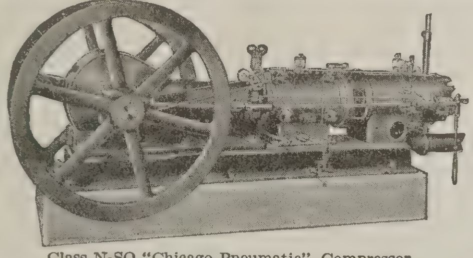

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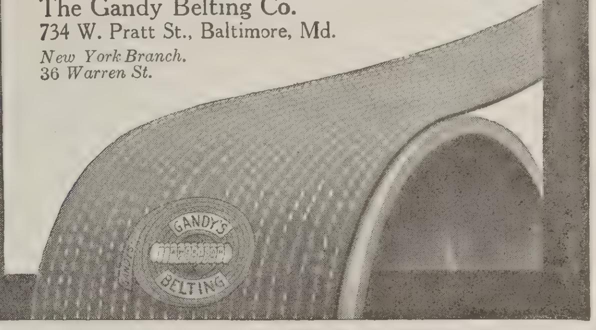

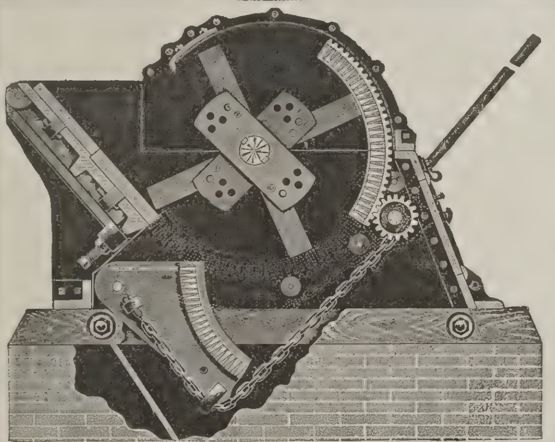

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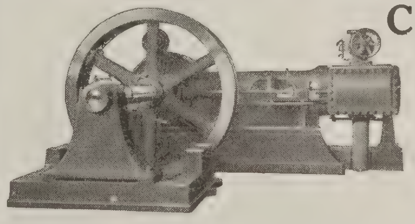

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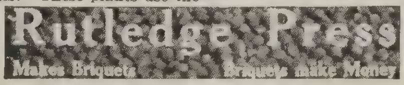

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Malcolmson Briquet Engineering Company
Old Colony Bldg. Consulting and Contracting Engineers **Chicago, Ill.**

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We design and Manufacture Coal Elevators, Conveyors, Apron and Belt Conveyors, Coal Buckets, Chutes, Screens, Wagon Loaders, etc. —Write for Catalog.

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means increased production and a big saving in labor and fuel. Used throughout the coke region. One Company has 82 in regular service. Write. We make all kinds of coke oven castings.

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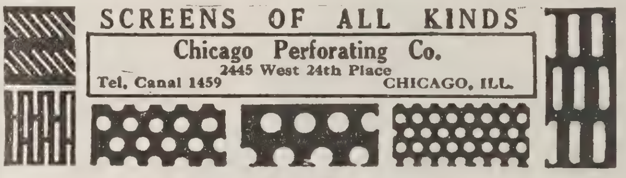

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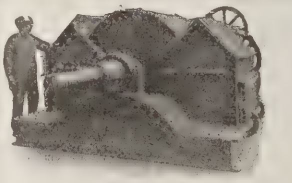

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Specialists in Coal Crushing and Cleaning Machinery for By-Product and Bee Hive Cokeplants, Coal Mines and Power Houses.

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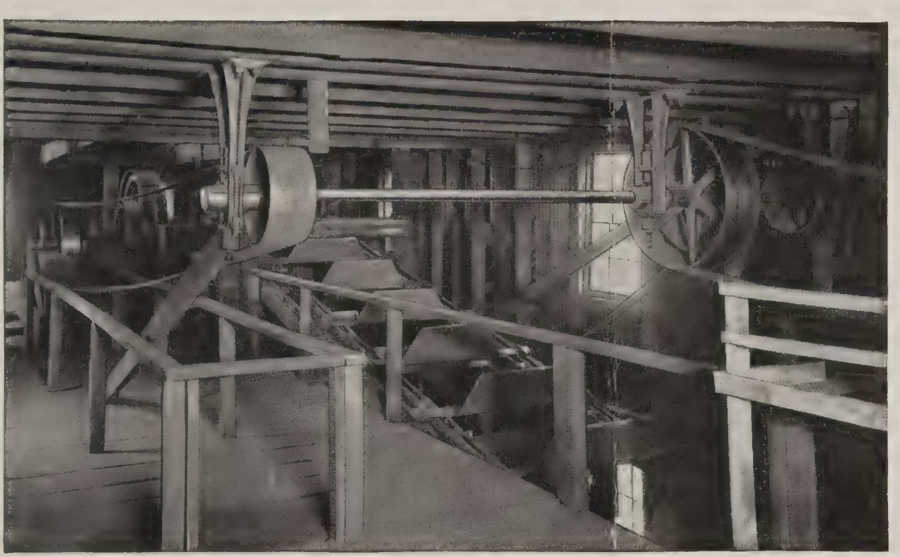
There's many a dollar lost in avoidable breakage between the pit car and the railroad car.

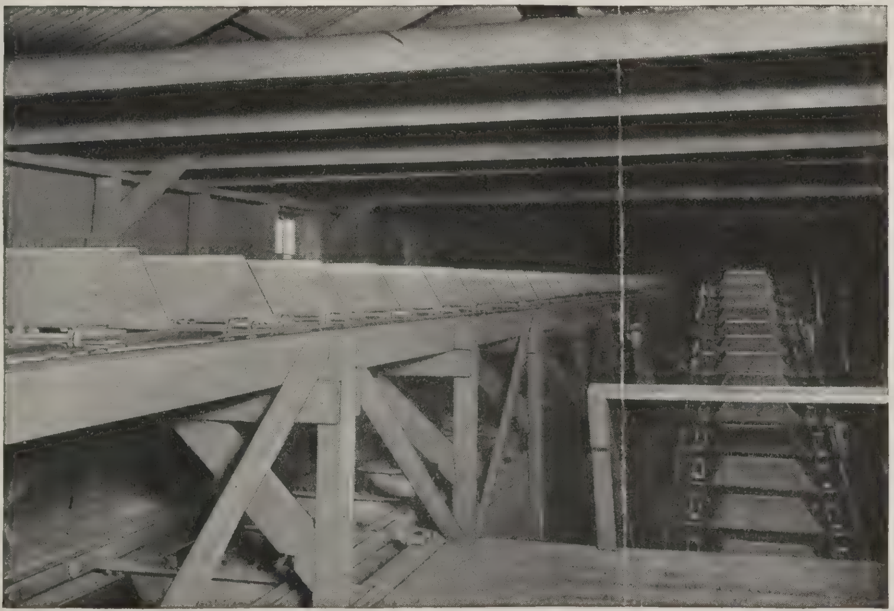
Are **you** losing money that way, or do you **carry** your coal to the car instead of **throwing** it there?

Keokee Tipple of Stonega Coke & Coal Co.

Webster Conveyors are Money Savers at any Coal Tipple



Conveyor Feeding Coal from One Seam to the Shaker Screens.



Conveyors for Both Coals, from Dump and from Screens to the Railroad Cars.

Types and Arrangements to Suit All Circumstances

Pictures here show the flight conveyors installed at the Keokee (Va.) tipple of the Stonega Coke & Coal Co., for independent handling of two kinds of coal, one of which is always loaded as run-of-mine, while the other may or may not be screened.

The picture above shows the mountainside tipple and indicates the distance through which the coals are conveyed from the dumps to the cars.

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LINK-BELT

Number 33
Issued Every Saturday
Link-Belt Company

Weekly News of Modern Methods for the Handling
and Preparation of Coal at the Mine

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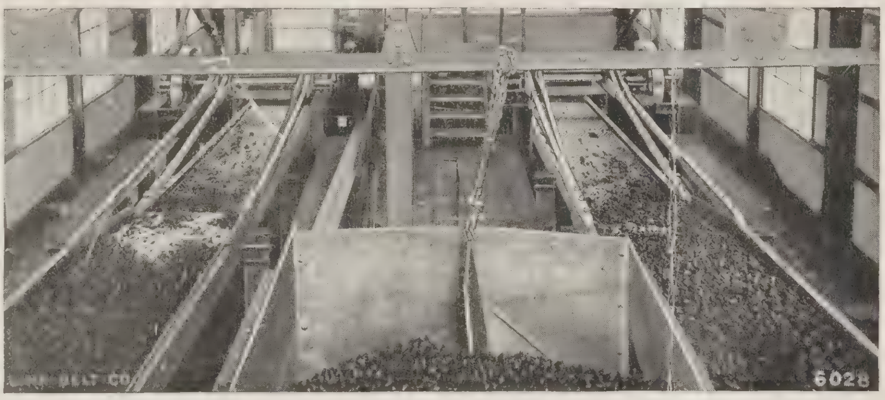
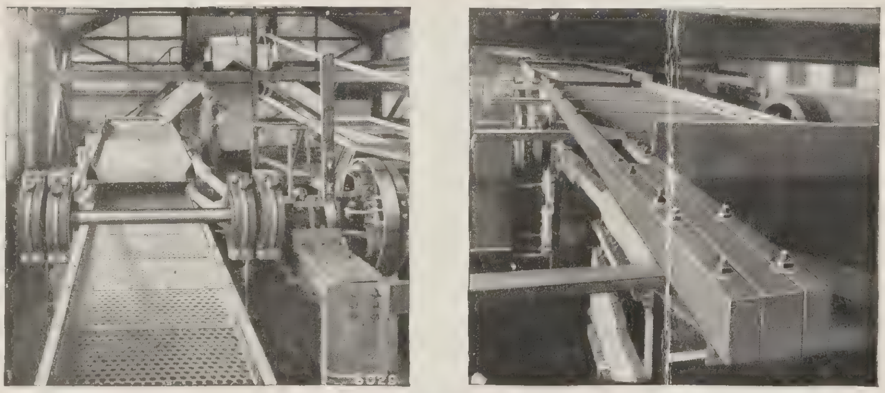


Link-Belt "Flexible Support" Screening Equipment.



Close views of Link-Belt "Flexible Support" screens, showing eccentrics and connecting rods. Carried on flexible legs, requiring no overhead structure.

Close views showing method of attaching flexible supports to screens and building structure. Light. Efficient. Guarantees perfect screening.

Correct Screening

The principles governing the correct screening of coal are elemental and simple. Take for instance lump coal as it comes from the mine cars and is dumped on the screen—the first real stage of preparation. If the screen inclines at the proper angle (see illustration) the coal has some natural downward movement by gravity, and with the assistance of a slight vibratory motion of the screen, the particles are kept in suspense as it were, the coal gently agitated, thereby permitting the particles to be correctly sized by passing through the proper perforations. The slow, uniform and continuous movement of the coal over the entire screening surface, tilting the screen just enough so that fine coal will not ride on the lumps, gives the ideal movement for thorough screening.

All Link-Belt Screens

are designed to fit their individual requirements—and they do.

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